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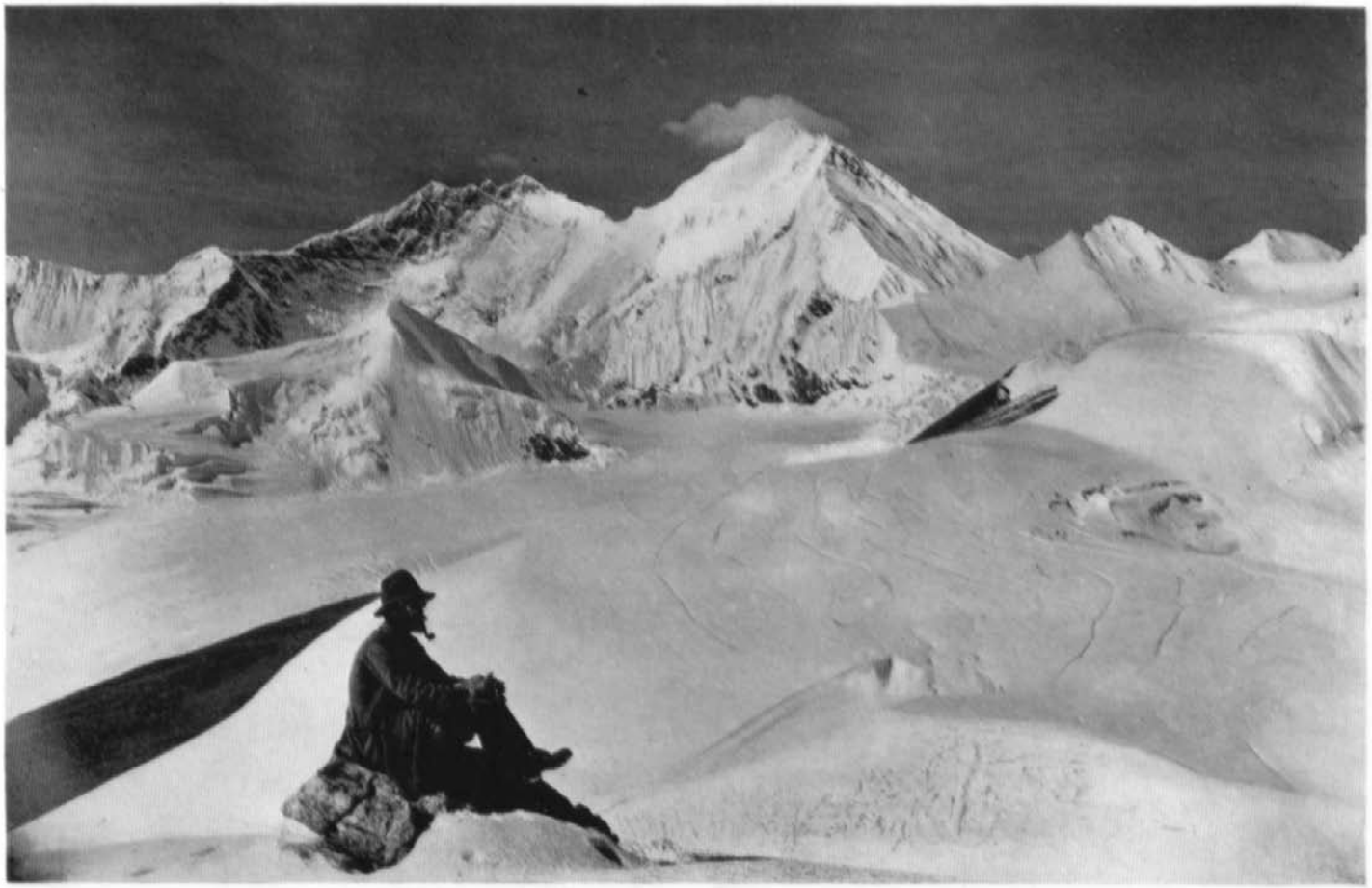

Mount Everest and South Peak From Near No. 1 Advanced Camp

Members Of The Expedition
(Left To Right) Standing - Wollaston, Bury, Heron, Raeburn. Sitting - Mallory, Wheeler, Bullock, Morshead

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MOUNTAINEERING SECTION

The Mount Everest Expedition, 1921[1]

By E. O. Wheeler.

It was my great privilege to be appointed one of the officers of the Survey of India to accompany the Mount Everest Expedition in 1921. I had purchased a set of Canadian photo-topographical surveying equipment on behalf of the Survey of India in 1920, and was to have carried out an experiment with the Canadian method during the hot weather of 1921, in the Garhwal Himalayas; but the Mount Everest group offering equally suitable country, besides possibly being difficult to map with the plane table, it was decided that I should carry out the work there.

Mount Everest is situated on the frontier between Nepal and Tibet in Latitude N. 27° 59' 16".2 and Longitude E. 86° 55' 39".9 and is the highest measured mountain in the world; its height as triangulated by the Survey of India has been accepted as 29,002 feet above mean sea level, but owing to improved knowledge of the deflection of the plumb line and conditions of atmospheric refraction, the mean value for the height will now probably work out at about 29,140 feet.

For many years there has been considerable controversy regarding its name, position and even existence; an excellent summary of the history of the mountain and composition of the 1921 Expedition has already been published in this Journal by Mr. A. L. Mumm (A.C.)[2]

I was in camp near Dehra Dun when I heard that I was to go; the message came as a bit of a bombshell, for although I knew that an Expedition had been proposed, I was under the impression that it would not take place until 1922, if at all. And it was with somewhat mixed feelings that I received the news, for I then thought that the Expedition would leave Darjeeling about the middle of April, and I was to be married in Bombay in March! However, it turned out to be not quite so bad as that, and eventually my wife and I reached Darjeeling from Dehra Dun on April 30th.

We found that the only members who had so far arrived on the scene were Major H. T. Morshead, D.S.O., R.E., the Senior Survey Officer with the Expedition, and Mr. Harold Raeburn (A.C.) the leader of the mountaineering party, Dr. A. M. Kellas (A.C.) who had been in India since his attempt on Kamet with Morshead in 1920, was somewhere in Sikkim, no one knew quite where; news had filtered in that he had climbed Narsingh. a 19,130 foot outlier of the Kangchenjunga group, but that was all. Dr. A. M. Heron, Geological Survey of India, whom we had met in Calcutta on our way through, was expected to arrive within a day or so. The remainder of the party were still en route from England, and consisted of the leader, Lieut. Colonel C. K. Howard-Bury, D.S.O., (F.R.G.S.), Mr. A. F. R. Wollaston, D.S.C., M.B., (A.C.), Medical Officer and Naturalist, Mr. G. Leigh-Mallory (A.C.) and Mr. G. H. Bullock (A.C.), the two remaining climbers.

Darjeeling is like many other Indian "Hill Stations", except for its weather, which is

1 Note—For pronunciation of place, names and glossary of terms, see article later on

2 C.A.J., Vol. XII, p. 1, et

atrocious. Only twice or three times in the three weeks I was there did I get even a glimpse of the Kangchenjunga group which, although nearly 50 miles away as the crow flies, appears to tower immediately over the town. But Darjeeling and Sikkim have been described by many writers: I shall give only a brief sketch of our organization, our march to and from Everest, and of the country passed through; a rather more detailed description of the climbing carried out in the neighborhood of our objective, and a narrative of my own doings in connection with the photo-topographical survey; the latter will I think be of interest to Canadians, and particularly to the Alpine Club of Canada, as being a method which has been more extensively applied in the Canadian Rockies than anywhere else in the world. For a full history of the Expedition with topographical, geological and natural history notes, and for descriptions of Sikkim and Tibet, I would refer to Colonel Howard-Bury's book[3] and to Douglas W. Freshfield's "Round Kangchenjunga," both of which will be found most interesting volumes.

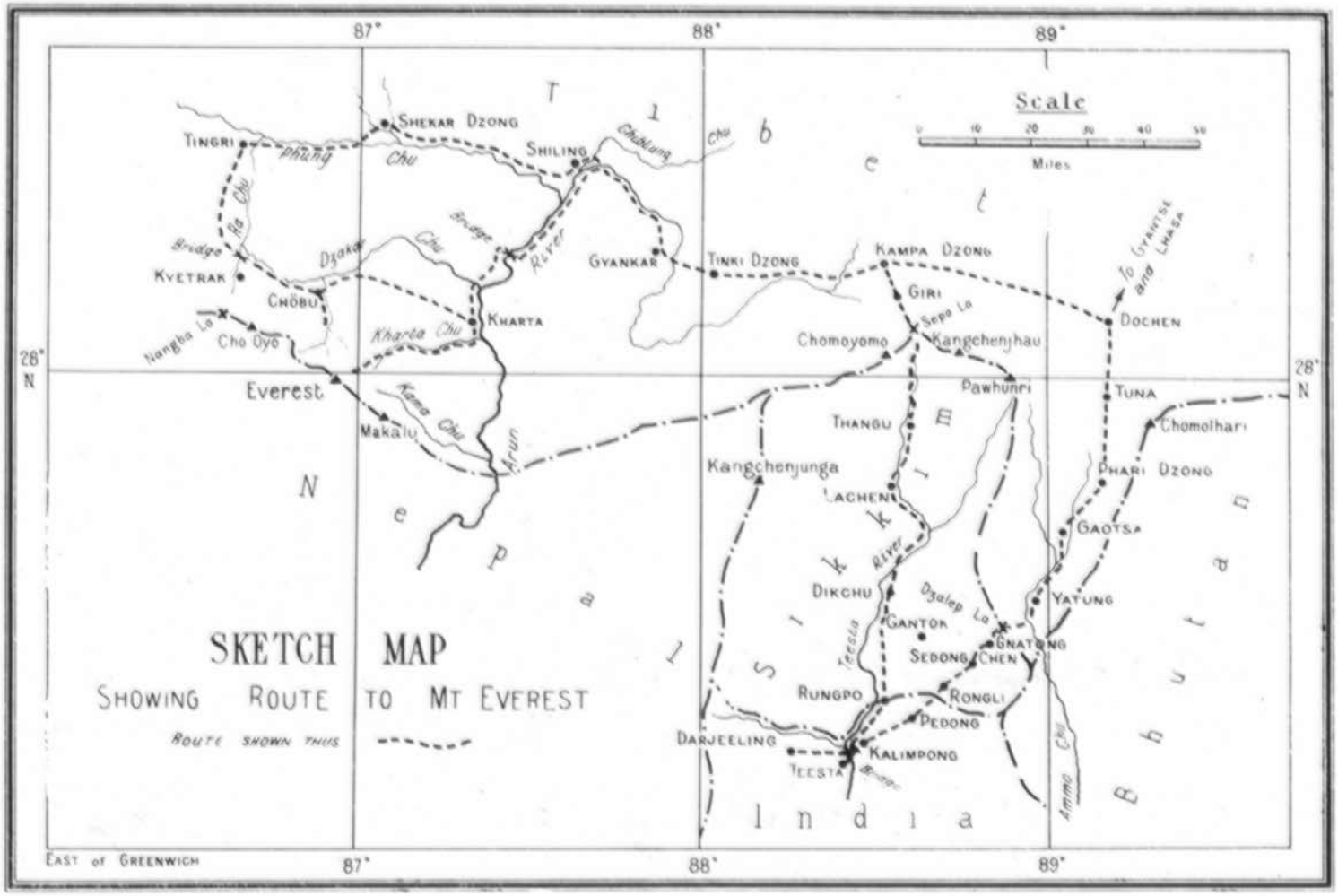
The remainder of the Expedition gathered by degrees; but the last arrivals, some 87 pieces of baggage which had been delayed in the Hoogly River and contained most of the grub and climbing stores, did not reach Darjeeling until May 14th, necessitating the postponement of our departure until somewhat later than had been intended. Nearly all the stores came from England. Grub (that for high climbing being specially packed in light boxes each calculated to last one man for ten days), "Whymper, Mummery and Meade tents, eider down sleeping bags, climbing ropes, ice axes, light cooking utensils, "Primus"' stoves, oil and spirit containers, cameras, photographic plates, scientific instruments, etc., etc., comprised some of the vast quantity of material to be collected and sorted out at Darjeeling. In addition, there were tents for lower altitudes, warm clothing and boots for the coolis, and various other oddments purchased in India.

Everything had been thought out in the greatest detail by the committee in England. For instance, the ordinary "Primus" stove will not work well, if at all, over 20,000 feet; so a series of experiments had been carried out at low pressures, and the stoves altered to make them work up to 30,000 feet, and detailed instructions for their manipulation issued.

While waiting for these stores to arrive, I should have liked to visit Sandakphu on the Nepal frontier, from which a fine though distant view of the Everest group is obtained; but the weather experienced made it quite useless. However, as soon as Bury arrived and we had heard his plans, we were able to commence final preparations, and time hung by no means heavily on our hands. Bury had been to Simla; passports to travel in Tibet had been granted; Government had loaned the Expedition 100 mules; and everything possible had been done; to make things easy for a large expedition travelling through British territory, Native Sikkim and Tibet. Nepal might not be entered; it has always been a country practically closed to Europeans, and it was not thought fit even to approach the Nepal Durbar for permission to enter it. Opportunity for the exploration of the southern slopes of Everest was of course stopped; but since the monsoon breaks in full force on that side it was unlikely that much could be done at that time of year in any case, and since so far as was known the north was the only possible line of attack, the non-permission to enter Nepal was not so serious as it might have been.

In order to approach Mount Everest from Darjeeling without entering Nepal, it is necessary first to travel north to Kampa Dzong in Tibet—the headquarters of the British mission to Tibet in 1903—and then to proceed west, parallel to and north of the main Himalayan chain. It was decided to march in the first place to Tingri Dzong, some 40 miles south and 20 miles west of Everest, and

3 Reviewed on a later page



Sketch Map Showing Route to Mt. Everest

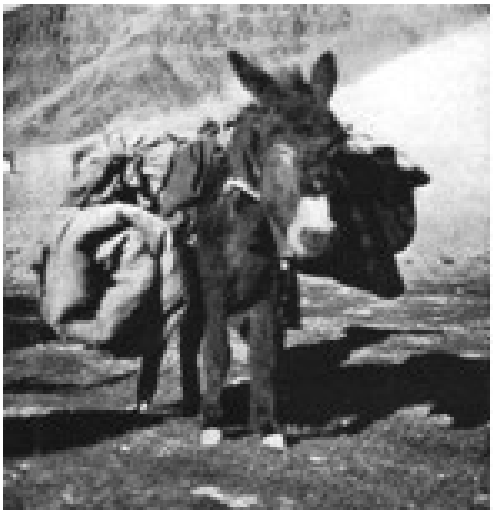
make our first headquarters there. Then, as the reconnaissance of that side of the mountain was completed, to move back to the east, and so home.

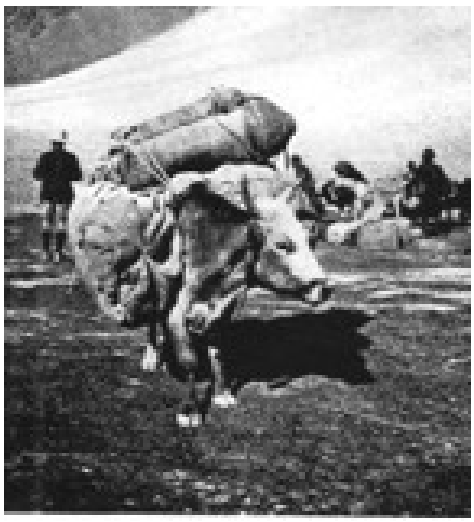
To reach Kampa Dzong there are two main routes, both allowing of minor variations. One is direct up the Teesta Kiver valley via Lachen and the Sepo La, and the other, the main trade route to Tibet, is via Pashok, Teesta Bridge, Kalimpong, Pedong, Rongli Bridge, Sedongchen, Gnatong, the Dzalep La (14,300), Yatung, Gaotsa and Phari Dzong. This latter was the route chosen by Bury; it is slightly longer than the other, but the pass is lower and it is possible to obtain local supplies and transport in considerable quantities, which is not the case by the direct route. Bury's judgment was proved sound by the failure of our 100 Government mules. The telegraph line to Lhasa also follows this route, and there are British Post Offices as far north as Gyantse (where there is a small British Military Post and Trade Agent), which run a daily post to Phari and twice weekly from Phari to Gyantse.

The transport, in addition to the 100 mules loaned by Government, consisted of some 40 picked coolis, all under two headmen or "Sirdars", engaged for the period of the Expedition; many of them had already climbed with Eaeburn or Kellas in Sikkim. Besides these, Morshead and his three surveyors and I had our own transport consisting of coolis or animals as the occasion demanded. Unfortunately, the Government mules, accustomed as they were to work on the Plains of India, were unable to stand the heavy gradients and rough tracks of Sikkim, and had to be replaced at Sedongchen by local animals. From there on we used mules, ponies, cattle, yaks, zohs (the hybrid yak and cow), and. donkeys indiscriminately; they varied at every stage. The method of packing is similar to that in use in the Rockies, substituting raw hide or yak hair rope for the "basket rope" and omitting the diamond hitch. Naturally loads fall off. But one is prepared for that and packs accordingly; and there are always two or three men or boys—more or less—to each animal, so that a great deal of time is not wasted. Stuff always got through in the end and anything easily breakable was carried by cooli; the cooli will carry 60 Ibs. with ease over the hills of Sikkim, and 40 lbs. up to 20,000 feet or so. The animals all carry about 80 lbs. a side, but perhaps the yak takes a bit more. Two interpreters, four native cooks, our personal Indian servants, and riding ponies completed the "outfit."

In order to make use of the dak (traveller's) bungalows on the trade route the party was split into two, travelling on consecutive days. Morshead had already started on May 13th via the Teesta route in the hope of doing a little reconnaissance for triangulation, and to inspect the work of his surveyors, who were revising the existing maps; which left four of us in each of the parties travelling by the trade route. Bury, Wollaston, Mallory and myself with about half the transport formed the first detachment, and Raeburn, Kellas, Heron and Bullock the second. We were to join up at Phari Dzong and go on in one party from there.

The first detachment left Darjeeling on May 18th, 1921. Bury waited to see the second party off on the 19th, and overtook us at Kalimpong, our second stage. Our route as far as Sedongchen lay through the heavy tropical jungle of Sikkim; the track, which is steep but well kept, and in most parts paved with large stones, alternately plunges into deep steamy gorges and climbs over high jungle-clad spurs. Darjeeling is 7,000 feet above sea level; Teesta Bridge is 700 feet; Kalimpong is 4,200 feet; and so it goes on, up and down, down and up; and always through the most gorgeous tropical forest. In fine weather there are wonderful views; but we were denied them, even though the rains do not officially "break" until June 15th. We had no more than fleeting glimpses of forest clad hills dotted here and there with patches of green and gold cultivation; of milky torrents far down in mysterious mist-filled gorges; and very occasionally, of some distant snow peak, gone





Transport Methods of the Expedition. Photos, Major E.O. Wheeler

almost before it could be distinguished from the surrounding clouds.

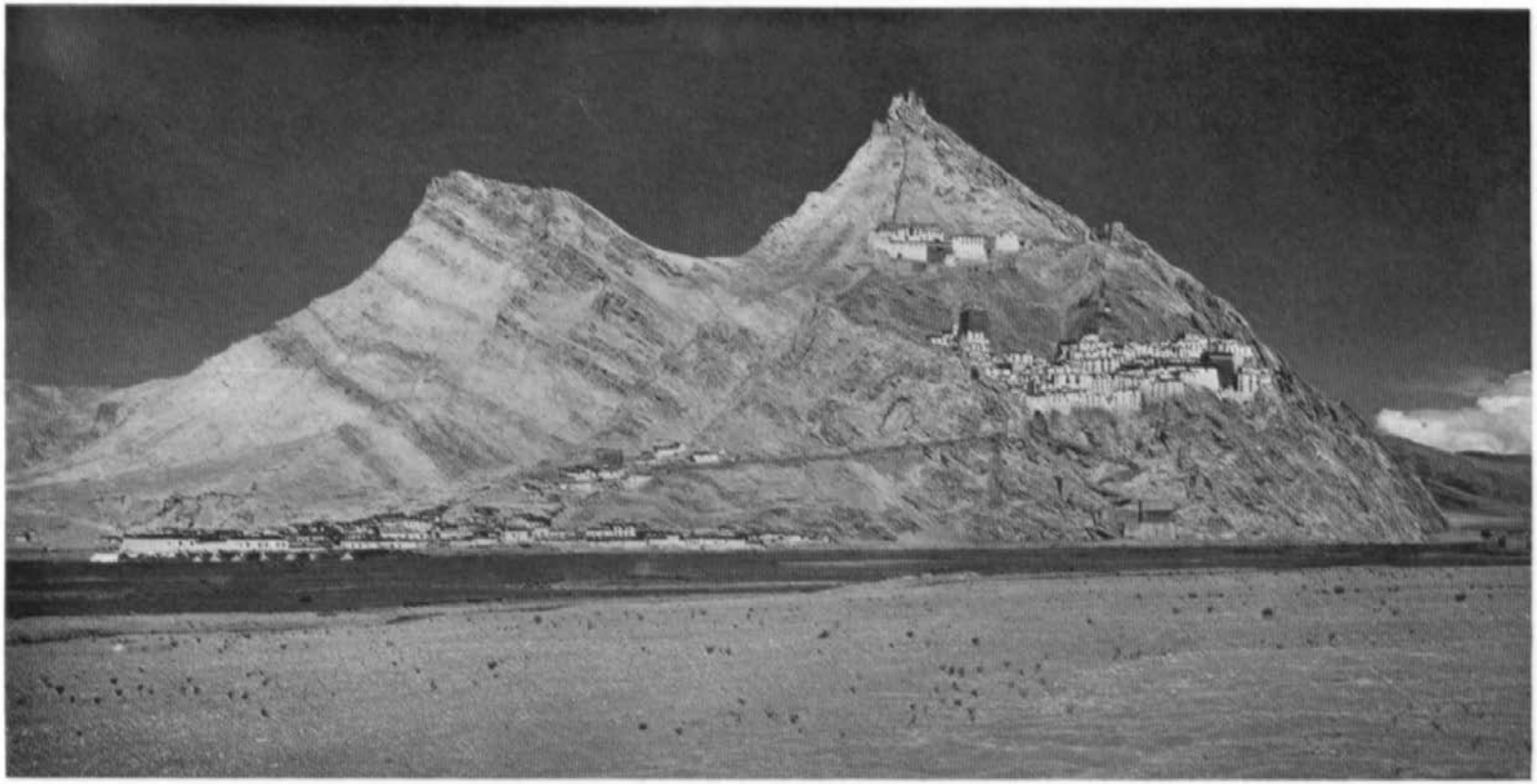
Sedongchen is about 6,000 feet above the sea and half way up the long, steep spur up which the track zig-zags from the Rongli Chu to Gnatong and the Dzalep La. Above Sedongchen, the character of the country changes; the forest becomes less dense and tropical in appearance, and near Gnatong (12,000 feet) few trees but rhododendrons are to be seen—masses of them of all sizes, bearing flowers of all the colours of the rainbow; and higher still are grassy alps covered, when we passed, with beds of purple primulas. In this portion of the journey we had almost our only experience of the leeches for which Sikkim is famed; nasty little brutes about the thickness of a match and three-quarters of an inch long, they sit on the stones in thousands and wave at you as you pass, and crawl through the boot-lace eyelets of the unwary. Fed, they become considerably distended, and after a day's march one may easily find one's boots "full of blood."

From Gnatong one rises above all trees; the 50-foot rhododendrons of 11,000 feet are replaced by 6-inch dwarfs with tiny magenta flowers; and they, with scrub juniper, are the last to disappear. The Dzalep La we crossed in clouds and rain, but even so the top (14,300 feet) was bright with flowers. From the summit the track plunges steeply through juniper, rhododendron, fir and pines to the fertile Chumbi Valley at 9,000 feet; and again rises, gently this time, among the fields and pastures bordering the Ammo Chu and through the same belts of trees and shrubs until the brown, grass-covered Tibetan plateau is reached close to Phari Dzong (14,300 feet). The change from heavy forest to bare grass is striking, and defines very clearly the limit of real effect of the monsoon.

The march to Phari occupied 11 days, including a day's halt at Rongli Bridge and another at Yatung in the Chumbi Valley where there is another British Trade Agent and small military detachment. There we were royally entertained by Mrs. McDonald, the Trade Agent's wife, who sent her own servants to the Dak bungalow, with tea and dinner for each party. Such hospitality is not soon forgotten; needless to say, full justice was done to it.

From Phari Dzong, where we halted two days to rearrange stores and collect transport, to Kampa Dzong, the route lies over the plateau at altitudes varying from 14,000 to 17,000 feet. There are several possible ways, but that we followed was north to Dochen, the second stage toward Gyantse, and thence west; five days trek in all. We were unable to discover why that route was recommended except that, being longer, it put more money into the pockets of the mule and donkey men. By the time we reached Kanipa Dzong we were all accustomed to food cooked over yak-dung fires; to bitter and unceasing winds; and to the glare of the sun baked plain; and had learned a little to estimate distances in the clear air. We had left the rains behind us; the sky was clear all day and every day, and at intervals we saw the high peaks of the main range, though beyond and sometimes round them, there hung the heavy bank of cloud which seldom lifts from over Sikkim. Chomolhari, a 23,000 foot peak on the boundary of Tibet and Bhutan, gave particularly fine views on this section of the journey.

At Kampa Dzong we halted a day to collect transport. This is apparently necessary at all District Head Quarters in Tibet. Where there is a Dzongpen (Governor), there you must halt at least one day while you pay your respects and transport for the forward move is collected; you exchange presents with the Dzongpen and eat, to the European palate, most unpleasant and heavy food. The tea in particular is terrible, being boiled together with salt and butter! Your transport is collected from many villages; each village is alloted a portion of your kit to carry, the kit previously having been divided into) as many lots as there are villages represented. Each headman then removes his garter—they wear garters in this, country to hold up boots, socks being non-existent—and



Shekar Valley And Monastery.

all are collected inside the cloak of the official making the allotment. He takes out one at a time and throws it on the nearest lot of baggage. The headman to whom the garter belongs repeats the process with the various families from his village; and then the squabble begins. Needless to say, this is not the work of a moment; you are extremely lucky if you leave the Dzong by midday, so it is advisable always to decide on a short march your first day out, and to insist on your transport doing as many stages as possible without change.

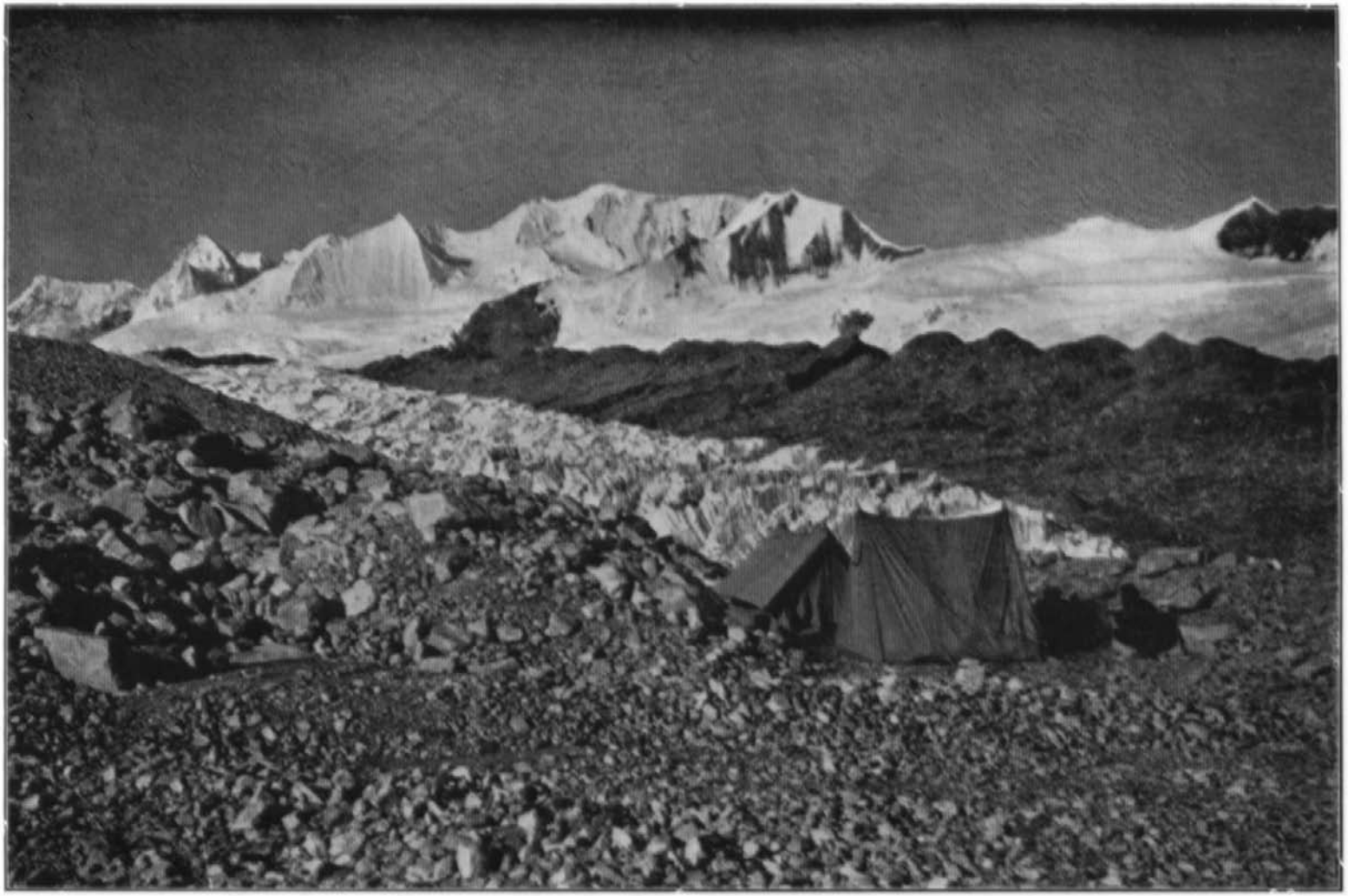
Dr. Kellas had not been well all the way from Darjeeling, and had been carried in a stretcher from Phari: unfortunately the last march to Kampa Dzong, a long and arduous one, proved too much for him, and he died on June 5th near the summit of the pass, 7 miles from camp. He was buried on an eminence near the Dzong which commands the whole range from Chomolhari to Everest, and above which tower the three great peaks he had climbed—Pawhunri, Chomoyomo and Kangchenjhau.

Raeburn also had not been well, and went with Wol-laston over the Sepo La to Lachen and Gantok to recuperate ; Wollaston left him at Lachen and followed on, rejoining the Expedition at Tingri Dzong on June 22nd. Rae-burn after some time at Gantok and Darjeeling, started out again, and rejoined the Expedition at Kharta on September 1st, a few days before the final climb.

Morshead we found waiting at Kampa Dzong; he had been able to do no work in Sikkim owing to the cloudy weather and had come straight through, employing his ten days at Kampa Dzong in picking up the old triangu-lation sations of the 1904-5 expedition.

On June 7th we left Kampa Dzong and trekked through to Tingri stopping one day each at Tinki Dzong and Shekar Dzong, district headquarters, and arrived at Tingri on June 19th, just one month out from Darjeeling. From Kampa Dzong to Tingri the country is similar to that between Phari and Kampa; but near Tingri there are outcrops of limestone, and the scenery becomes bolder and more rugged. The main range was in sight more or less all the way, and from Tingri is in full view from Everest westwards. Everest itself we had considerable difficulty in identifying until well to the north of it. Our only excitement during this thirteen days march was the crossing of the Chiblung Chu (a confluent of the Phung Chu from the north) at Shiling. Here there are serious quicksands, which we crossed in a strong north wind; the dry sand from the dunes in mid-stream and from the banks was blowing off so strongly and continuously that it seemed as though the whole river-bed, about a mile wide, was shifting. Our dinner that night, camped as we were with no shelter on the river bank, seemed to consist mostly of sand dune.

Tingri is a small fort and village clustered on the side of a “butte” some 300 feet high in the middle of the maidan or plain of the same name, and close to the confluence of the Ra (Goat) Chu with the Phung Chu. It is the headquarters of a sub-district under the Dzongpen of Shekar, and being on one of the trade routes from Nepal to Tibet, boasts a few traders at intervals; so that one is able to obtain small quantities of supplies and transport there and occasionally, to change money from Indian rupees to Tibetan tankas, which incidentally is not always easy. Bury had hired a house—at one time the Chinese officials’ guest house—just outside the village, which gave us excellent quarters for ourselves and all our coolis, besides store rooms, mess and photographic dark room. It proved to be leaky; but even so was a pleasant change from living in tents on the wind-swept plain; though not before considerable house cleaning had been done. Here we all spent several days making final preparations for our various expeditions: Mallory and Bullock to prospect the north and west faces of Everest; Bury to explore the lower valleys north of it and the route to Kharta, our next headquarters; Morshead to start his surveyors at work in the neighborhood; Wollaston to collect natural history specimens; Heron geologizing; and I to start my



On The Kyetrak Glacier, Looking Towards The Nangba La. Photo, Major E.O. Wheeler

photographic survey. One European had always to be at headquarters to look after things and keep the others supplied with grub and money.

Mount Everest is flanked to the west by a high group reaching to 26,750 feet, to the north by a group reaching to 23,640 feet, to the east by the Makalu group (27,850 feet) and to the south by many high peaks. Permission to enter Nepal not being available, only the area north of the boundary could be considered. A map which will explain Mount Everest clearly and will show its connection with the neighboring mountains and with the drainage of its vicinity, must include the mountain groups mentioned above. In fact, they, with Mount Everest itself form one great mountain mass, the whole of which may be described as the "Everest Group."[4] This classification is borne out by the general topography of the area.

About 20 miles west of Everest and immediately west of Oho Oyu (25,750 feet), the Ra Chu flows north from the Khungphu (Kombu) or Nangba La (on the Nepal-Tibet boundary) to Tingri, where it joins the Phung Chu flowing east; the Phung Chu after following an easterly course for some 65 miles turns south to flow through the main chain, about 30 miles east of Everest and close east of Makalu. About 20 miles north of the Nepal boundary a tributary of the Ra Chu from the east gives a low pass to the Dzakar Chu, flowing down from Everest, first north and then northeast to join the Phung Chu about 30 miles north of the frontier. These two streams practically form the dividing line between the real mountains on the south and the high rolling hills of Tibet on the north. The area south of these two streams and bounded east and west by the Phung Chu and Ra Chu respectively thus contains a mass of great peaks, including the groups referred to above, which culminate in Mt. Everest in the centre and which all drain eventually via the Phung Chu through the Arun Gorge into Nepal and so to the Ganges.

This area seemed suitable for the experiment. It contained some 1,200 square miles of country—about a sea son's work, given fine weather—and gave opportunities for photographing all types of country from rolling hills Math villages and cultivation, through steep gorges, to glaciers and tremendous snow and ice clad mountains. With Major Morshead's approval, I therefore decided to tackle this area with a view to mapping it on the scale of 1 inch to 1 mile.

Accordingly on June 24th I moved up the Ra Chu and on the 26th established my base camp in a bleak little village called Kyetrak, about 20 miles south of Tingri and one mile below the snout of the Kyetrak Glacier leading to the Nangba La, at an altitude of about 16,500 feet. Heron came with me as far as Kyetrak.

In addition to surveying equipment, and heavy gear left at the base, I used the following outfit in my light camps:

1 "Meade" Tent for myself.

1 "Whymper" for the three "High" coolis, who remained with me.

1 Dark tent for changing plates. (Not necessary on dark nights.)

1 "Primus" stove for my personal cooking. This was a two-burner "roarer" type, which I found to work very satisfactorily up to 19,500 feet. Above that height, spirit stoves or a specially adapted Primus must be used.

1 Gasoline tin filled with kerosene oil.

1 or more small tins methylated spirits.

1 or more of the expedition high climbing boxes of food, each calculated to last one man for ten days, and weighing about 30 lbs.

4 Mr. Freshfield suggests this should be called the Chomolungma Group.

A small supply of aluminum cooking pots, plates, etc.

Bedding, consisting mainly of down sleeping bags, change of clothes, etc.

Spare photographic plates.

Coolis rations, cow-dung fuel and blankets.

With this equipment I slept 41 nights on moraines and glaciers at altitudes between 18,000 and 22,200 feet. It was carried by 10 permanently engaged coolis, who also acted as dak (mail) runners and fuel gatherers, etc. They were not fitted out with warm clothes or light tents, and therefore had always to sleep at the main camp, only coming up to me as required.

The Canadian equipment and method of surveying has already been fully described in these pages.[5] I used identical instruments; the method in general was the same although it varied in detail to allow for the different type of country; deeper, steeper and narrower valleys, and convex rather than concave slopes.

Two fine days at the outset enabled me to identify several triangulated points, and to obtain a general idea of the topography, and raised my hopes considerably for the future. But these two fine days were practically the only ones I had in this area, and though I spent three weeks living in a tiny tent on the moraines between 17,000 and 19,000 feet, I was able to do only 5 more indifferent stations; and finally had to give it up for lack of time. On July 14th I moved to my base at Kyetrak and on the 15th to the bridge across the Ra Chu, 6 miles lower down. On the 16th and 17th I moved a light camp up to 18,000 feet and tried for a 20,000 foot station commanding the Ra Chu valley, but was again defeated by snowstorms and cloud; so on the 18th, leaving my camp at the bridge, I walked in over the 18 miles of stony plain to headquarters at Tingri, to spend a few days there developing plates and resting.

I found Bury alone at headquarters. He had been to Kharta, our next headquarters, and gave most glowing accounts of the comparatively lovely country on that side —trees, grass, flowers, barley-fields—things we had not seen for weeks! After the moraines and snow of the upper Ra Chu valley, Tingri seemed a little paradise to me; and as the weather held bad with the mountains always in cloud, I decided to wait till the 24th and accompany Bury as far as the Dzakar (or Rongbuk) valley; then to go up where Mallory and Bullock had been, to map that side of Everest itself.

Up to this I had not seen Everest, but on the evening of the 23rd it cleared a bit and from the summit of the "butte" above our house, we had a glorious view of all the big mountains from Everest to the west—covered with new snow. On the 24th we moved back to my camp at the bridge—where as usual it snowed and on the 25th we moved on through 3 inches of new snow to Chobu village, situated on the Dzakar Chu, some 25 miles north of Everest. On the way it cleared, and at about 4:00 p.m. from the ridge above Chobu I had my first real view of the mountain, and a glorious sight it was. At Chobu we met Mallory and Bullock and spent a busy evening exchanging experiences and extracting information from one another.

On the 26th the others moved on for Kharta, 3 days' march from Chobu, while I occupied a station near the village; from this station I gathered a good idea of the country, and was able to make a plan of action. I then moved my main camp up the east side of the Rongbuk valley, first to the monastery 10 miles up, and then to the snout of the Rongbuk glacier, taking stations en route.

The Rongbuk glacier is a large one, of which the main stream flows almost due north from the great amphitheatre formed by the north face of Everest, its north peak (Changtse) and its north-west ridge. The west branch flows east from the southern slopes of the Cho Oyu group, Where it

5 C.A.J., Vol. XI, p. 76 et seq.

gives a comparatively low ice pass to Nepal, and joins the main stream some 3-4 miles above its snout. The east branch is formed of two streams; one from the east gives a pass between Khartaphu and Khartichangri into the head of the Kharta valley, and one from the south-east gives a high col (Hlakpa La on which we afterwards camped) south of Khartaphu also to the Kharta valley, and a lower pass, just east of Everest itself, to the Kama valley. The latter is, however, rather too steep on the south side for loaded coolis. These two streams meet and flow together for about 2 miles to the snout of the East Branch, from which a large stream flows over a distance of about one mile to the main glacier, under which it plunges, about 2 miles above the snout. These three glaciers drain the whole of the north and northwest faces of Everest.

This area had already been explored, as far as possible routes were concerned, by Mallory and Bullock, and as I had to cover much the same ground for mapping purposes, they were able to give me considerable help as regards camp sites, routes, etc. But in spite of their help, the weather was so bad that in the course of a month I was only able to take a total of 10 stations in this whole area; and from many of these the photographs were mainly of cloud banks! But I was fortunate in getting one really fine morning on the west glacier, from which I had a magnificent view of Everest and its west and north-west ridges. My camps in this area were all on moraine or moraine-covered glacier, and varied in height from 18,000 to 19,500 feet.

It was essential that I should have a month free for the mapping of the east side of the mountain, so on August 23rd, having completed the north and west sides after a fashion at any rate, I moved back to Chobu and thence across to Kharta, where I arrived on the 27th.

I had intended to take stations en route looking up the small valleys running north to the Dzakar Chu from the Khartaphu group, but again the weather defeated me and 1 saw nothing but clouds; so that unfortunately this area had to be omitted from the map.

I found Bury's description of Kharta fully justified: the change directly one crosses the watershed from Chobu is extraordinary; shales and granite give place to gneiss, and bleak rounded slopes to sharp ridges, covered on their lower slopes with green grass and scrub. The valleys are narrower, steeper and lower in altitude: at Kharta itself there are trees and cultivation in comparative profusion, and after the bleakness of the Rongbuk, our camp seemed pleasant indeed. Again we had a house for store and dark-room; and lived ourselves in tents pitched in a grove of small poplars.

Here I found Mallory, Bullock and Morshead. They had decided on a route by which to attempt the mountain and had already established a base camp 20 miles up the Kharta valley at 17,000 feet, and a light camp some 8 miles further on, on the west bank of the Kharta glacier, at 19,700 feet. They were resting in Kharta and waiting for the weather, preparatory to moving a camp up to 22,200 feet on Hlakpa La, (Windy Col), from which they hoped the Chang La (North Col) and north ridge of Everest might be reached.

I spent six days at headquarters developing and printing photographs, and on September 3rd started up the Kharta Chu with Morshead. We hoped to take sufficient stations en route to map the lower valley, and then to join the others, who were all collecting at the base camp in the Kharta Valley, in time for the final climb.

Weather delayed us some days about 5 miles below the camp, and we finally arrived there on the llth without having done much useful work. However, time was getting short and a good deal remained to be done close to Everest; so we decided to join the remainder of the Expedition and come back to the Kharta valley after the climb, if time allowed.

No such luck however. Bad weather and fresh snow made a move upward useless until September 20th, though in the interval two clear mornings enabled me to get two useful stations,

and Bury, Morshead and Mallory to climb a 20,560 foot peak (Kamachangri) overlooking the Kama Valley, from which they got magnificent views. Heron could spare only two days and then returned to his geologizing, but the rest of us could do no work until the weather cleared, and had to curb our impatience as best we might. The timely arrival of long overdue mails did much to help however! Mallory and Bullock made one trip up to the 19,700 foot camp with firewood, etc., but came back in a heavy snow storm after one night there.

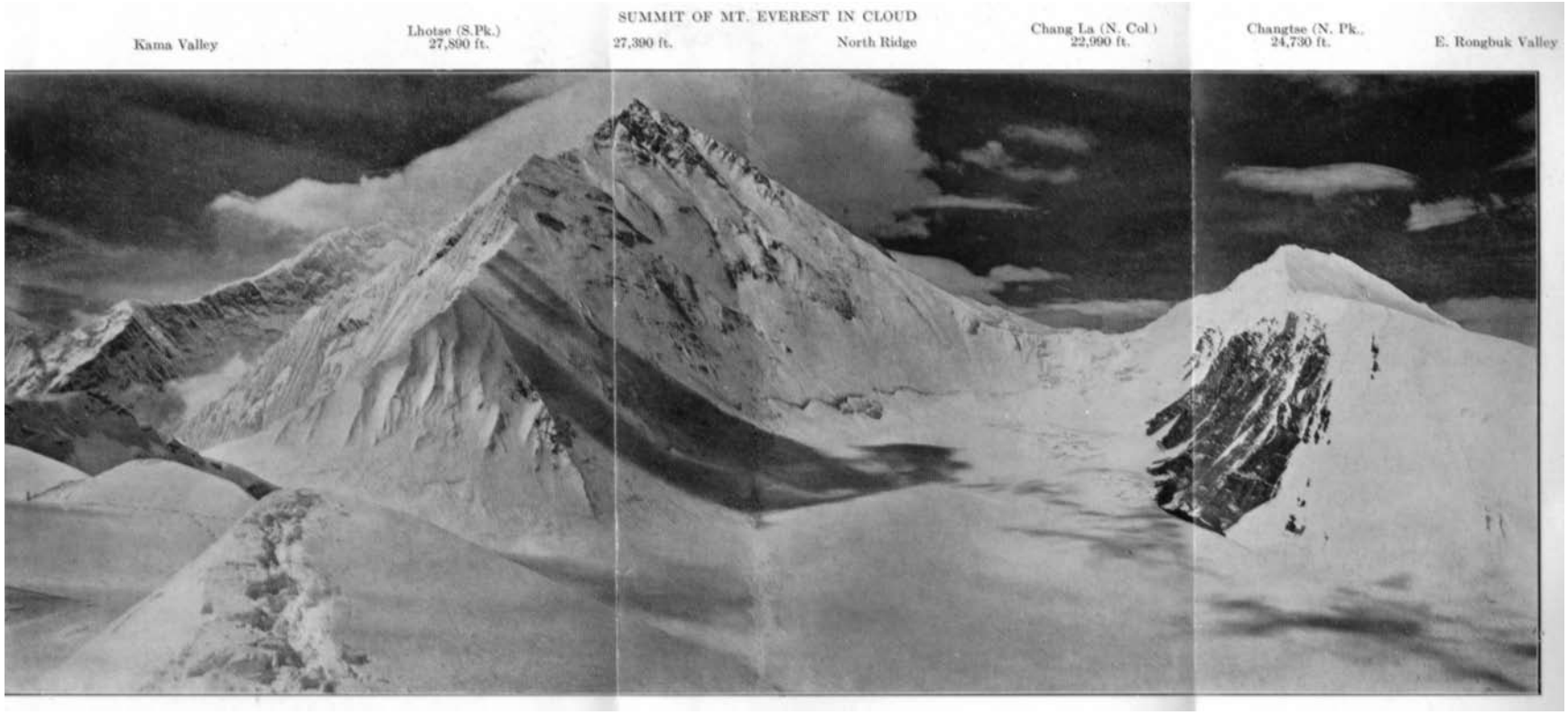
At last, however, the long expected "break" in the monsoon came, and on September 19th, Mallory, Bullock, Morshead and I moved up to the 19,700 foot camp, and were followed on the 20th by the others—Bury, Wollaston and Raeburn. The weather looked promising, except for high winds, and it was not uncomfortably cold at night, though one needed heavy down sleeping bags. We were to sleep at least two nights at this elevation, by way of acclimatization; I found myself short of breath when, getting into bed or turning over in my sleeping bag; but otherwise slept very well. I think the others were much the same.

"While acclimatizing, I took a survey station on each side of the glacier, and Mallory and Morshead made a trip up to the next camp—on Hlakpa La—and left a load of stores there. The others were busy with photographing and making final arrangements. Mallory and Morshead reported the snow very soft, but the nights seemed to get colder and we hoped that their tracks at least would have frozen sufficiently to give us hard going.

We were all away before dawn on September 22nd, 6 ropes each led by one of us, with 5 or 6 coolis to each; Raeburn stayed behind at the 19,700 foot camp to keep things going at that end. From the camp, which was on a shaly ledge under the snout of a small side glacier, the route descended 200 feet or so to the snow covered Kharta glacier, of which this portion is nearly level; so that crevasses gave us little trouble. About 2 miles from camp was an ice-fall—the only technical difficulty encountered —through which Mallory had found a good route on his previous visit to the pass. We reached the foot of it shortly after daybreak, and by 9:00 a.m. were well above it on the final series of snow terraces leading to the pass. Up to this point the going had been reasonably good; in places the snow was crusted and where this failed the old tracks were hard, if irregular. But from here on the route gradually ascended the northern slopes of a 22,850 foot peak flanking Hlakpa La, and the snow became powdery, so that even in the old tracks one was ploughing through it to one's knees, and the ice-axe, unless held upside down, sunk in to the head with each step. The altitude and hot sun also began to tell, and halts became more frequent.

By 11:30 however, we had all reached the pass (22,220 ft.) and after eating our lunches, set about putting up camp in a partially sheltered snow hollow just below the summit on the east side. There was a strong west wind blowing, and the snow eddies were unpleasant; there was 110 better place in sight, however, and when the wind had died down a bit at sundown, we were really comparatively comfortable. Bury and Wollaston shared a Meade tent, Bullock and I another and Mallory and Morshead a Mummery. A few of the coolis who were feeling the altitude were sent back and the balance—about 20—were clustered round us in Whymper and Mummery tents. Not much cooking was done; melting snow for 25 or 30 people on spirit lamps is a slow process, and we had never succeeded in making the Expedition Primus stoves work properly.

The night was cold—a few degrees below zero—but with a light cork mattress under our shoulders, a Wolseley valise and a blanket each under us, and our "flea bags" around us, Bullock and I slept fairly comfortably, if not too soundly. Neither here, our highest camp, nor at any other time during the Expedition did I feel any actual sickness from the altitude; but from, about 14,000 feet on I felt lassitude and headache in varying degrees according to acclimatization. The lassitude



The North Col - Highest Point Reached By The 1921 Party. Photo, Major, E.O. Wheeler

took the form of mental depression and disinclination to do anything at all. It is naturally difficult to breathe properly in the rarified air of great altitudes, and besides this and the consequent difficulty in getting proper sleep, I found it the greatest effort to get up sufficient energy to keep on going up hill. As I got more used to living at 19,000 or 20,000 feet, I found the effect no worse than I had first experienced at 14,000 feet. It seems to me that up to about 21,000 feet one can improve one's physical condition by acclimatization, provided one's stay at that height is not too long. But, above that height, I think that the longer one stays, the more feeble one is apt to become, partly owing to the cumulative effect of the altitude and partly owing to the severe weather conditions and indifferent food one will probably experience; and that therefore when one has to go up above 21,000 feet, one should go and come back without wasting any more time than is absolutely necessary.

Breakfast next morning consisted of fried sardines, and tea with frozen milk; our party was too large to make cooking easy in small tents. After breakfast a council of war was held, and it was eventually decided that the party was unwieldy as it stood, and that Mallory and Bullock and I should go on to the foot of the Chang La with three days' grub, and got as far as possible; and that the others should return to the 19,700 foot camp. While loads were being made up. I took a station on the top of the col; supporting the legs of my camera and theodolite in the deep snow on bags of grain—which incidentally worked very well indeed.

We got away about 11:00 a.m. and descended some 1,500 feet of fairly steep snow to the head of the East, Rongbuk glacier. This we crossed, and plodded up again in the amphitheatre between Everest itself and the east ridge of its north peak (Changtse) to near the foot of the Chang La, where we camped at about 21,500 feet. The camp was a repetition of the day before, but with only three of us in two Meade tents, we were able to do ourselves rather better in the way of cooking, and really had fairly comfortable meals. The wind however had been blowing most of the day and great gusts roared round the tents all night, making us rather doubtful of how far we might get on the morrow.

The 24th broke clear however, though we could see the snow blowing round the tops; and we started off about 7:30 a.m.—even then it was very cold—with 3 coolis, to get as far as we could. The coolis were very lightly loaded, having lunches, hand cameras and sweaters only, while we carried nothing at all. For the first thousand feet the going was much as it had been on Hlakpa La the day before, and we made fairly good time : but the last five hundred feet, a traverse across steep and very soft snow, was very slow, we did not reach the col until about 11:00. Just below the summit we came into some snow pockets—snow filled crevasses with overhanging upper lips—and were met by suffocating eddies of snow which warned us, if the "smoking" north ridge had not already done so, to expect a howling gale from the west on top. It was difficult to stand against the wind; and it was obviously out of the question to go on up the north ridge, which was exposed to the full force of the gale and off which the snow was pouring in a continuous cloud. However, we had been to the col; there was no great difficulty in. getting there; given less wind, a comfortable camp could be established on top; and best of all, we had examined the whole north ridge—fore-shortened certainly, but at close range—and no technical difficulty of any sort was apparent. The whole ridge at that time appeared to be a 30° snow slope as far as its junction with the summit ridge at about 27,400 feet; the final ridge, however, appeared to offer some difficulty with bands of cliff near the summit.

Mallory said he felt good for 2,000 feet more that day; I thought I could do another 500 feet, provided my feet, which had been completely numb for two hours, held out; Bullock was tired, but ready to go on. With the weather as it was, however, it seemed useless to think of going

any farther, and after a little photography and a few raisins and chocolates, we started down. Some of the snow we had traversed on the way up had slid away, necessitating some care in negotiating this place; otherwise the descent was uneventful, and we were back in camp about 1:00 p.m.

Another cold and gusty night, and a morning with the North ridge "smoking" again, put an end to any hope of going on, so we packed up camp and retraced our steps over Hlakpa La to the 19,700 foot camp. The day was fine, but blowing '' great guns'' when we crossed the col; and we were all very glad to get below the ice-fall of the Kharta glacier into the comparatively low altitude and quiet of the valley. I for one was very tired when I reached camp; and very ready for a sound sleep at 19,700 feet, which seemed very comfortable after three nights at 21,500 or more; and hot food, more or less decently cooked and eaten in the comfort of a big warm tent, helped considerably too!

The next day, September 26th, we broke up camp. Rae-burn, Morshead, Mallory and Bullock moved back to the 17,000 foot camp and next day down the valley; Bury, Wollaston and I crossed the Kharta glacier and Karpo La (19,940 feet) to the Kama valley, in which we camped at Pethang Ringmo (about 16,000 feet), a large meadow used during the summer months as a grazing ground for yaks. Here my servant met us, having gone round from the 17,000-foot camp via Kharta and the lower passes, with fresh supplies of food and firewood, and comfortable tents. And it was very pleasant indeed to camp on grass again, and at a reasonable altitude.

The following day was fine: Bury crossed the Kangshung glacier and ascended to a col west of Makalu, from which he had a fine view into Nepal and of the southeast face of Everest—no hope of a feasible route that way. I also crossed the glacier and went a short distance up the southern slopes to a shoulder, from which I got good photographs of the Kangshung glacier and east face of Everest. The clouds rolled up again in the afternoon; and that was the last we saw of the Kama valley. September 28th was wet, and although I sat all day on a prominent little peak on the north side of the valley, and had fleeting glimpses of most interesting scenery, I could do no work; and eventually arrived at camp, on a grassy terrace two or three miles below the snout of the Kangshung, very wet and tired. We celebrated our arrival in trees again by having a roaring fire of scrub juniper and rhododendron outside the tents.

Next day was again cloudy, and after waiting two or three hours in the hope of getting a view up the glacier, I packed up and followed the rest of the party. The track, here well travelled by the herds of yaks coming up every summer for grazing, leads over spurs and down to small side streams, always keeping well above the Kama Chu, which roars through a deep gorge below the stupendous cliffs of Chomo Lönzo. The clouds persisted, but about 3:00 p.m. when I reached the corner where the Kama Chu turns to the south through a great gorge, and the track turns north to descend to the bed of the stream from the Shaok La, they lifted enough to give glimpses of the extraordinary view, one of the finest I have ever seen. To the right, the Kama Chu and towering black cliffs of Chomo Lonzo, in front, the steep, timber clad slopes of the gorge, and beyond them the great moraine covered glacier flowing from the eastern slopes of both Makalu and Chomo Lonzo, which reaches well down into the timber and seems to block the whole exit from the gorge, where the valley turns again to the east. There is no track down the main valley here; all traffic must go over the Shaok La to Kharta, and back over other passes lower down, to Sakeding in the lower Kama valley. The autumn colouring of the trees was very fine, reds, yellows and greens mingling with the browns of the grasses and the blue-black of the cliffs.

From this corner the track descends sharply through big timber—mostly fir—to the bed of the Shaok La stream, at about 13,000 feet. Thence it follows the stream to the Shaok La. I was

Ropeway Across The Arun River. Photo, Major E.O. Wheeler

Typical Torrent Bridge. Photo, Major E.O. Wheeler

expecting to find camp at about 16,000 feet, 1,000 feet below the summit of the pass; it was raining and almost dark—and I was more than delighted to hear voices from the mist across the stream fully an hour below the intended camp-ground. I crossed the stream, and to my joy saw the tents tucked away under two huge blocks of granite on a tiny shelf—approximately level— close to the stream. The floor of our tent was wet and sloping; but Bury had been afraid that the upper (and more level) camp-ground would be snowed up, and had decided to camp below the final pitch to it, for which I was truly thankful.

Next day was fairly fine; we crossed the Shaok La (about 17,000 feet) by a good track, getting fleeting glimpses of Makalu and Chomo Lonzo through the clouds, and descended to the Kharta valley and so back to headquarters at dusk. Raeburn and Morshead were there; the latter just about finished his work to date and starting for Darjeeling the next day. Mallory and Bullock had already gone, and Heron was working several days away on the road to Kampa Dzong and expected to join us en route.

A few days were spent doing final developing of plates and packing up the headquarters camp. On October 5th, we—Bury, Raeburn, Wollaston and I—started for home with about 150 coolis, all the local animals being employed in harvesting the fine crops of barley in the valley.

This time we followed the route direct up the Arun (Phung Chu) valley, joining our out route near the quicksands camp at Shiling. The track up the Arun is very good, except for the river crossing, which is by means of a very "sketchy" ropeway reminiscent of Mr. Heath Robinson 's drawings in the '' Bystander''; very well for two or three people, but somewhat tedious for a party as large as we were. We started crossing at 11:00 a.m. and finished at 11:00 p.m., each man and load of baggage crossing singly on a wooden traveller pulled by the local villagers, who worked like Trojans. The few ponies we had were swum across on a rope; the ford is very difficult at that time of year, and quite impossible for loaded animals. From Shiling to Kampa Dzong, our route was the same as on our way out, and the journey was uneventful. We picked up Heron at Gyankar Nangpa, four days out from Kharta, and reached Kampa Dzong on October llth.

Here we separated, Raeburn, Heron and I going south over the Sepo La and down the Teesta valley through Sikkim; and Bury and Wollaston going on to Phari and down the trade route so as to be able to obtain transport, and to settle up accounts at Phari and Yatung. Our trip down through Sikkim was interesting and pleasant and I reached Darjeeling safely on October 20th, just 5 months and 2 days after leaving. A month there finished a preliminary sketch map of the immediate neighborhood of Mount Everest, and I returned to Dehra Dun to take up the final mapping on the scale of 1 inch to 1 mile.

Our job for the year was fairly well completed. Bury had explored a great deal of new country, had taken many beautiful photographs and had collected material for his book; Wollaston has made a large collection of plants, seeds, mammals and birds; Mallory and Bullock had thoroughly explored the approaches to the mountain and, up to 23,000 feet, the route for the final climb; Morshead had mapped some 12,000 square miles of new country on 54-inch scale, besides some 4,000 miles of revision survey in Sikkim, and I had collected material for the more detailed mapping on the 1-inch scale of some 600 square miles in the immediate neighbourhood of Mount Everest; and Heron had explored geologically practically the whole of the country within two or three days' march of the route followed. On the whole, we felt that we were able to pass on to the 1922 Expedition as complete information as it was possible to get in the time available, and to give them maps, photographs and general information sufficient to enable them to make a detailed plan of campaign for the final assault.

SPECIAL NOTE FOR THE CAJ DIGITAL EDITION

An oversized fold-out map of Mount Everest and vicinity was included in the hardcopy version of the 1923 Canadian Alpine Journal.

It is not included in this digital version due to size restrictions.

The expedition was a most interesting one in every way: the forests and flowers of Sikkim; the bare uplands of Tibet and finally the magnificent glaciers and peaks of the Mount Everest group: there was a vast deal to see and do among all these. Yet I found it very monotonous. The bitter wind of Tibet, which blows every day and all day from 11:00 a.m. to 11:00 p.m.; the almost unbroken cloudy weather we experienced near Everest; and more than anything else, the loneliness when all by myself at high altitudes, waiting and waiting for the clear day that seldom came; all these made me long to get back to real trees and comfortable altitudes and civilized food. I would not have missed the "show" for anything; but a little of that sort of country goes a long way!

Key To Pronunciation Of Place Names, And Glossary Of A Tibetan Terms In Common Use.

The writer does not pretend that the place names in the text are spelled absolutely correctly, nor that the following notes show the absolutely correct pronunciation; but it is hoped that they will form a guide which, if carefully followed, will enable the reader to pronounce any of the place names mentioned in the text at any rate approximately correctly.

Names in the text which are not included in the subjoined list, are pronounced exactly as they are spelt, bearing in mind that:—

All syllables are equally accented (though vowels may be long)

The vowel	a	is pronounced as is the	u	in "sun."
	e	"	e	in "get"
	i	''	i	in "tin"
	o	''	o	in "song."
	u	'' longer than	u	in "sun",
		but shorter than	oo	in "soon"
	y	" as is the	y	in "carrying."

The consonant ph is pronounced sometimes as f and sometimes as an aspirated p.
The consonant th is always pronounced as an aspirated t, never like th in "the" or "that."
Any consonant followed by h is pronounced on similar lines. The final k is sometimes silent in Tibetan.
In the subjoined list, the unmarked vowels are pronounced as above. The marked vowels are however pronounced as below.

The vowel	å	is pronounced as is the	a in "cart."
	e	"	ay in "say"
	i	"	ea in "seat"
	o	"	oa in "coat"
	u	"	oo in "soon."

The consonant (k) is silent.
The vowell ö is modified.

Ammo	Dehra Dun	Kangchenjhau	Phari
Arun	Dochen	Khartaphu	Pawhunri
Bhutan	Dzakar	Khartichangri	Ra
Chomolhari	Gaotsa	Kyetra (k)	Rongshar
Chomoyomo	Garhwal	Lachen	Rongbu (k)
Cho Oyu	Giri	Lhasa	Sandakphu

Chomolungma	Gyantse	Makalu	Sepo
Chobu	Kamachangri	Narsingh	Shao (k)
Chomo Lonzo	Kamet	Nepal	Tingri
Darjeeling	Karpo	Pashok	

Glossary

Chorten A sort of miniature temple, built as an offering to Heaven, often to subdue and keep down a particularly malignant devil. Is often lined or filled with religious inscriptions and images of Buddha. A buddhist passes a chorten on the left, i.e., with his right hand next it.

Chu Water, hence stream.

Dak. Stage or mail (post). (Hindustani word).

Durbar Court (Hindustani word).

Dzong Fort.

Dzongpen Governor.

Gompa Monastery.

La Col, pass.

Mani wall (Mendong) A structure very like a chorten, but in the shape of a wall, sometimes 1/4 mile or more in length. It is covered with inscriptions, "Om Mani Padme Hum" (Hail, jewel of the lotus flower), and is passed similarly to a chorten.

Pahari Hill man. (Hindustani word).

Ri Hill, mountain.

Sirdar Headman. (Hindustani word).

Tsangpo River. (Applied especially to the Brahmaputra).

Tse Peak.

Some Aspects Of The Everest Problem

By T. G. Longstaff

(Medical Officer to the Expedition of 1922.)

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In the following notes it is assumed that the reader is already familiar with the narratives of Mallory and Finch, which have been published in the Alpine and Geographical Journals. Nothing will be found here which does not tally with these accounts, but the writer feels that certain points in the problem deserve greater stress than has, so far, been laid upon them. Nor is there here the faintest intention of any criticism, except in so far as the climbers have belittled their own achievements. On the Second Expedition to Mt. Everest I was, as far as climbing went, a mere spectator; but a spectator can write perhaps more freely than an actor. Actors suffer from modesty, while a spectator sees more of the game than any single player. For instance, a spectator like myself can best recognise a fact, which on my return I find had not been universally realised, that the climbers were well advised to lose no time in making the first attempt and in sending four men on it. Had not the two attempts been made when they were, the expedition would have returned with far less results, if indeed it had accomplished anything. As to the value of those results I would quote Dr. De Filippi, a critic whose judgment no one will challenge. He writes: "I could never have hoped that you would have accomplished so much in one single year."

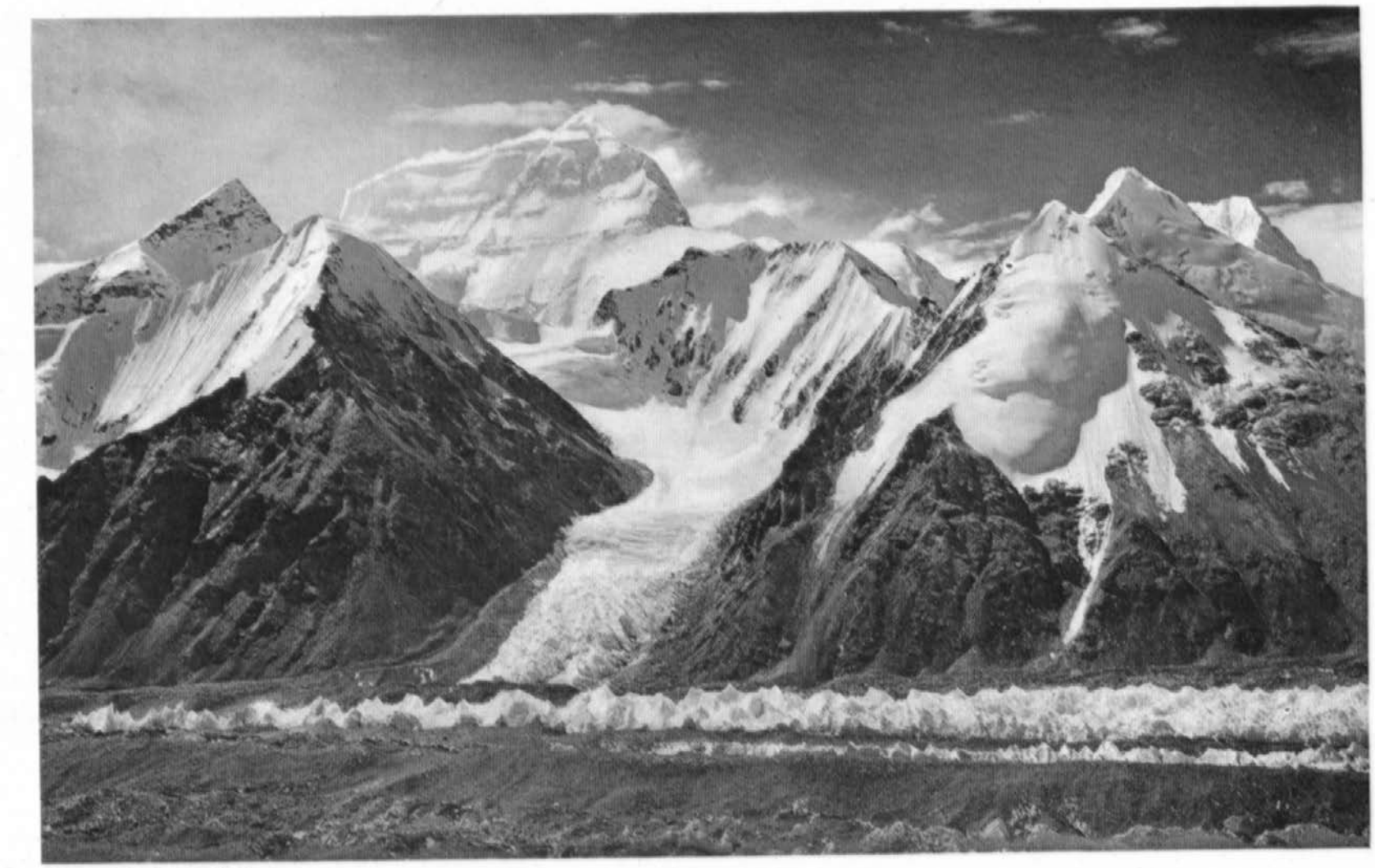
Turning to details, dare I again repeat the opinion which I have expressed often before, that I do not believe in trying ascents in the Himalaya after the monsoon. This belief I formed when I first tested the problem seventeen years ago, and it has been strengthened by every subsequent visit. I do not believe that an autumn ascent is impossible, but I think the snow conditions at that season, especially on Mt. Everest, are likely to be too dangerous; and I agree with Farrar that " do or die" principles do not accord with the ethics of the Alpine Club. A light monsoon ending unusually early in the season would obviously modify the normal autumn conditions very greatly to the advantage of the climbers.

As to the composition of the climbing party, almost every conceivable combination of numbers for the final ascent has its own special advantages. A party of one European with one or two Sherpas would have an excellent chance, and their entire transport and supply problem would be reduced to very simple proportions. With a very small party the intermediate Camps 1, 2, and 3 would not need to be continuously and simultaneously occupied by members of the expedition. Again, two Europeans would have a better chance of getting to the top than three. Practical considerations will probably limit an oxygen party to two. . Four is a good number, especially for an attempt without oxygen and when more food can therefore be carried, because if one falls out another can be spared to take him back to the last camp. A man must, of course, always retire before he breaks down. On the whole, it seems that either a very small party, or a party of about eight climbers plus four transport officers, is the ideal. To get the utmost out of the porters such linguists as the two Bruces, Morris, and Crawford are essential. Language difficulties were accountable for at least one case of lack of co-ordination at the high camps, which might have seriously affected the success of the expedition.

As to the climbers' age, while twenty-five to thirty is probably the ideal, yet individual variation is so great that each case will have to be taken on its merits. Owing to the War, the supply of young climbers is more limited than formerly. There is also the difficulty that experience of snow and ice conditions at different seasons and in several parts of the world is a desirable qualification. It is urgent that a sub-committee should get to work at once for the selection of next year's climbing party.

With regard to outfit, the expedition was greatly indebted to the labours of Farrar, Meade, and Unna. The outfitting was splendidly done. But a few suggestions may be put on record:—For a large party involving continuously and simultaneously the occupation of four or more camps, more tents will be required, and very much more artificial fuel. Irrespective of the size of the party, each climber should have at least four eiderdown sleeping bags— one for each of the four highest camps; this simplifies transport and increases mobility. Clothing must include light wind-proof Arctic kit, which must be assumed at once in case of wind. Boots should be of thick felt with a nailed leather sole sewn on underneath. This problem should be taken in hand at once; it is vital. A sledge is necessary to take a sick man over the soft snow from the foot of the N. Col to half-way between Camps 3 and 2. Beyond this point the Norwegian back-carrier proved better than a stretcher. I believe that Rosine powder, to mark the track on snow, would have saved the first party much time, anxiety, and danger on their descent to the N. Col.

Enough stress has not been laid on the abnormal type of evaporation at these very high altitudes. Owing to the dryness, combined with the increased diathermancy of the air, evaporation is incredibly rapid. It is scarcely an exaggeration to say that above 25,000 ft. snow does not melt but evaporates literally into thin air. Thus ice is rarely met with at great altitudes. We got our first good view of Mt. Everest from the Pang La on April 28. The whole N. face of the mountain was



Mt. Everest From 19,130 Ft. On N. Bank Of The West Rongbuk Glacier. Photo, Major E.O. Wheeler
Distance To Everst 14.5 Miles.

then so completely free from snow and ice that it was long before I could be persuaded that this was indeed Everest. Such conditions obtain even at lower altitudes, and snow lies but a very short time on the Tibetan Uplands. We awoke at the Base Camp on June 4 to find four inches of snow on the ground; by 10 o'clock the ground was dusty. Glaciers have no streams worthy of the name (at any rate before the monsoon), because their surface ice evaporates directly into the air. Thus are produced those fantastic pinnacles and towers which characterise the northern glaciers. Somewhat similar conditions prevail on the N. side of the Karakoram; but the honeycombing of the surface is the more noticeable effect. This abnormal type of evaporation was the cause of the fatal avalanche. On the shady slopes at these great altitudes a layer of new snow does not melt downwards in the ordinary way and freeze on to the layer beneath; rather it evaporates upwards and tends to form a homogeneous, brittle layer, which, like a thick crust, may break off as a separate unit. Strutt tells me that somewhat similar conditions occur amongst the Alps in winter. I venture to add my personal conviction that though snow and ice conditions vary the world over in far greater degree than do rock conditions, yet in the different parts of the Himalaya alone these variations exceed those found in all the rest of the world put together.

The loss of body fluids by evaporation is, in my belief, a grave element in mountain sickness. Thirst is a terrible trial at great altitudes, and I think had much to do with Morshead's breakdown. The obtaining of the necessary minimum of drinking water is as difficult as any problem we have to face. Some type of Arctic snow-melter is an absolute necessity. The solid spirit we were provided with is the most convenient form of fuel; there may be technical objections to its use at the highest camps, but if so these could be resolved by experiment in the pneumatic chamber. I believe it could be used safely inside a tent, thus eliminating the danger of frost-bite to the cook. It is easier and better in every way to utilise ice rather than snow, but it is unlikely that ice will be obtainable at the high camps.

In reviewing the evidence as to the value of oxygen I will endeavour to confine myself to the facts and to refrain from theory. But nothing is harder than to arrive at the true facts of any problem—except, perhaps, to state them impartially. In dealing with the mere figures, the rate of ascent and descent per hour, every mountaineer knows that no two ascents can ever be exactly comparable. In the present case the figures must be read in strict relation to the accounts of Mallory and Finch already published. Any mountaineer having read these will appreciate that the figures for the two final attempts are not fully comparable one with the other, because the Second Party traversed a much greater horizontal distance than the First Party. Again, the descents from Camp 5 to the N. Col are even less comparable, since the First Party were here burdened with a sick companion. The times of Strutt's Party of May 17 have, therefore, been utilised for the descent of the N. Col without oxygen. The point reached by the First Party proves by theodolite to be 26,985 ft., but the writer's mathematical limitations make a round number preferable.

	First Party		Second Party	
	Without Oxygen		With Oxygen	
	Hours	Feet per Hour	Hours	Feet per Hour
Ascending				
21,000—23,000	4	500	3	666
23,000 — 25,000	4 1/2	444	3 3/4 (to 25,500)	666
25,000—27,000	6 1/4	320	5 1/2 (to 27,250)	318*
Descending				
27,000—25,000	1 1/2	1,333	2 1/2 (to 25,500)	700*
25,000—23,000	7 1/2	1,200	1 1/2	1,666 3,000
23,000—21,000	1 2/3		2/3	

*These rates are not comparable because of the much greater horizontal distances traversed.

The remaining evidence is more circumstantial and therefore more difficult to weigh. The First Party turned back only because of the lateness of the hour. When they got down to the Base Camp they all agreed that they had not reached their limit, and professed that they could have gone to the top, so far as their physical sensations indicated. The Second Party turned back at noon. I regret that Finch's modesty has not permitted him to be more explicit as to the incident that probably decided their retreat.

When the accident to Geoffrey Bruce's oxygen apparatus occurred, he was on a rather steep slab. He struggled on, his strength failing under the onset of unconsciousness. Before he could fall, Finch dragged him up the slab and Geoffrey Bruce collapsed beside him. It is bare justice to record the opinion I formed, at the time and on the spot, that Geoffrey's life was only saved by Finch's forethought in providing himself with a Y piece and spare tube so that both could breathe from one apparatus, and by Finch's skill in making the repairs. On the other hand, it is clear from the Second Party's intermittent use of oxygen at night that physiologists have overrated the danger of cutting off the supply, at least when at rest. To sit down at once, in the case of a similar accident while climbing, may be a sufficient remedy. But those using the apparatus should be trained and skilled in its use. In further palliation of this risk it is to be noted that Tejbir, who broke down at 26,000 ft. when using oxygen (and carrying 50 lbs.), descended alone (probably using oxygen) to Camp 5, and after a rest there (probably without oxygen) was able to descend to Camp 4 the same evening. Finch and Geoffrey Bruce deserve our unstinted admiration for performing an experiment which they had been warned, even by members of the committee, might be of grave danger to themselves. It is no reflection on them to assume that it was this accident, so ably met, that actually decided a retreat in this instance. For it is noteworthy that, despite the gruelling they had endured at Camp 5 and their famished condition, they accomplished the long descent to Camp 3—over 6,000 ft.—the same afternoon.

At this point a digression may be permitted. The circumstances in which this great climb was accomplished must always be borne in mind. The climbers had spent twenty-four hours in a furious gale, sheltered only by a frail tent, at 25,500 ft. Their anxiety must have been intense and exhausting. They had only taken up food for one day. Communications were open on the second

day between their bivouac and Camp 4. The porters who visited the climbing party on the second afternoon brought up an inadequate supply of provisions. It was in a famished condition that the climbers started on their attempt the following morning. The success they achieved cannot but be of the greatest encouragement to future climbers, who may reasonably hope to make their attempt under less unfavourable conditions. In this connection it is desirable also to emphasise the circumstances of the First Party. Both parties were compelled by the onset of bad weather to bivouac at a lower point than they had intended. Both parties had to get their coolies back to Camp 4 before the weather got really bad. It was the intention of both parties to camp at 26,000. (Finch in his narrative notes a possible bivouac site at about this height.) It was on this day, the day before the final attempt, that the First Party were frost-bitten. Furthermore, the following morning bad weather delayed their start, and consideration for a sick companion left in camp demanded an early return. Under such adverse circumstances both parties had legitimate reasons for retreating from Camp 5 and postponing their respective attempts. Yet they went on. Their success under the circumstances was magnificent, and gives sure hope of ultimate success to more fortunate climbers.

With the exception of Somervell, the First Party arrived at the Base Camp absolutely played out. They had expended their utmost endurance on their tremendous effort. Morshead's hands and feet were in a very serious state from frost-bite. Somervell, who had had much experience of such conditions during the War, considered that amputation would be necessary, but warned me not to operate except under certain circumstances. He and Wakefield agreed with me that Morshead must be taken back to normal levels as soon as possible. I wrote a formal medical report to General Bruce to this effect. I also examined the other three and reported that Mallory and Norton were unfit for further attempts. Their frost-bites alone were reason enough to invalid them, because a recurrent exposure would probably have led to the loss of hands or feet. Norton had undergone a great additional strain in helping Morshead down. Mallory's responsibility must have been exhausting; that he supported his companions' dangerous slip shows that he was equal to the strain, but he must have drawn heavily on his reserves of energy. It is difficult to estimate the effect of such mental strain on the physical condition when the margin is already reduced to such narrow limits. Somervell appears to be physically incapable of exhibiting the symptoms appropriate to his physiological environment; he showed no signs of exhaustion, except a few superficial frost-bites on his fingers. I considered him to be the only one of the six high climbers who remained fit for a second attempt. Nevertheless, it is suggestive of the value of oxygen that the worst cases of frost-bite occurred in the First Party. The Second Party report that they were greatly benefited by taking small quantities of oxygen during their second night at 25,500 ft.; considering their lack of fuel and food, I do not doubt that they would have been badly frostbitten without this aid.

Against oxygen it must be recorded that on and after their arrival at the Base Camp, though both parties had played themselves out, the general physical condition of the Second Party was distinctly worse than that of the First Party. By using oxygen, the Second Party put their engines under '' forced draught''; they were enabled to take more out of themselves; because of it they desired more food. Judicially, there is no evidence that the Second Party would have been more or less exhausted than the First Party, if neither had used oxygen. There is obviously no proof that the Second Party could ever have attained 27,000 ft. without its use. But if it were a fact that they could not, then we have the strongest argument that can be advanced in favour of oxygen; that its use will enable a man to ascend Everest who is physiologically not capable of succeeding without such assistance.

I reported in writing to Bruce that, in my opinion, neither Geoffrey Bruce nor Finch were fit for another attempt. I did not want my companions to run the possibility of a risk of their courage being challenged by anyone incapable of realising the true position. The climbers, however, exhibited no gratitude. Luckily, neither Morshead, Norton, nor Geoffrey Bruce could walk, so they were in my power. But Mallory and Finch persisted in joining Somervell in the last attempt, with Wakefield and Crawford in support, and Morris in charge of the lines of communication, transport, and supply. Finch, however, was compelled by physical weakness to turn back after he had reached Camp 1. The margin of safety was vanishing.

Norton and Geoffrey Bruce were packed off on ponies to Kharta, as from their general condition it seemed probable that they would be restored to health in that comparatively genial region, a Capua so long desired by all of us. But Morshead was suffering acutely, and went steadily downhill; constant pain kept him awake night after night, and opiates had no effect on him. Strutt, who had spent nearly a fortnight at 21,000 ft. and over, was showing increasing deterioration, with marked loss of weight. Finch's condition was serious. Impaired constitutions are incapable of contending against the bad effects of prolonged residence at high altitudes, and it was necessary to get these men down quickly if permanent damage was to be avoided. Accordingly, we four left Rombuk on June 6, and reached Darjeeling in nineteen days, having covered 320 miles without a hitch, thanks to the excellent work of Gyaljen and the assistance of Tibetan officials. The rapidity of our retreat, which excited some surprise and comment at home, undoubtedly saved Morshead's hands and feet. Morshead bore his sufferings with his usual fortitude. Thanks to the following of Somervell 's advice, he made a wonderful recovery; but his right hand is permanently maimed by the loss of the first three fingers.

Frost-bite being literally due to deprivation of oxygen owing to the cessation of blood circulation, the deficiency of oxygen in the air breathed at high altitudes produces a very '' vicious circle,'' which retarded recovery even at the Base Camp. Very great credit is due to the climbers for asking to be given another chance. It is very well known that high altitudes have a most depressing effect on morale; this is freely acknowledged by the Air Force; such a request, therefore, indicates an extreme degree of mental resolution on the part, of the climbers. But it was my duty to give a flat refusal in cases where I believed that perseverance would produce permanent serious injury—or worse. Nobody capable of comprehending what these men had gone through will venture to criticise such a decision.

Noel's experience provides one of the most valuable and hopeful pieces of physiological evidence obtained during the whole expedition. In his case very good acclimatisation occurred during his four days' residence at Camp 4 (23,000 ft.). Many physiologists, including the writer, did not believe that any really beneficial degree of acclimatisation could occur at such an altitude. But with Noel the improvement was undeniable; cinema work at such an altitude is a good "control test." At this point I would emphasise the fact that the whole question of the use of oxygen is far more complicated than is generally assumed. Thus the taking of oxygen continuously at very high altitudes must, inevitably prevent anything approaching to complete physiological "acclimatisation" from taking place. Furthermore, a climber who has been continuously using large doses of oxygen on the mountain must, when he descends to the lower camps and ceases to use it, find himself worse off for oxygen than he was before, because there is still only half an atmosphere at these camps. But if he had not used oxygen on the mountain, he would be getting into a richer oxygen supply with every foot that he descended, and when he got down to the Base Camp he would obtain considerable relief from the relatively increased percentage of oxygen there.

Enough of theory: to return to our facts. About a dozen Sherpas spent more than a week at over 23,000 ft. At least half of these made three or four journeys to 25,000 ft. and over, twice carrying loads up to 40 lbs. in weight; all this without oxygen. Statistics of their rates of progress would have been very valuable. They had no cases of frost-bite, seeming to be quite unaffected either by very hard work or very low temperatures, or long residence at very high altitudes. Their youth and the way in which they seized on the sporting aspect of the struggle were their most remarkable characteristics. I had urged that a fresh set of porters should be used for each attempt; but the first set refused to budge. They refused to share their glory with the others; it gave them a pull with the ladies! There appears no reason why some of these lady-killers should not be capable of conquering even Everest without oxygen and of carrying loads even to 27,000 ft. The organization and equipment of this corps is General Bruce's outstanding contribution to the Everest problem. The success we achieved this year is really due to his consummate knowledge of the peoples of the Himalaya. I believe we are all agreed that they were better than Alpine professionals for this job.

After what has been said and written, I cannot too categorically state that physiologists (of whom I am one) are agreed that oxygen must be of the greatest value on Mt. Everest: but its use as a platform missile is to be deprecated. Given enough oxygen the upward limit for humanity is not reached until above 40,000 ft., where the boiling point of water falls to 99° F. At this point the climbers themselves will naturally begin to boil too. If liquid oxygen could be utilised a climber could easily carry twenty-four hours' supply and the whole problem would be enormously simplified. But of gaseous oxygen you cannot carry half this amount, and so to make full use of it, oxygen must be relayed—and Everest does not take kindly to dumping. I confess that I never believed that anyone could carry our apparatus as high as climbers could get without it. I admit that Messrs. Siebe Gorman and the Oxygen. Committee fairly scored off me. Still it is inevitably carried at the expense of fuel and food. With great diffidence, as a constructive policy, I advocate that oxygen be taken, but used only as a last resort, and in small quantities. The amount required by different individuals will be found to vary to an unexpected degree, but the less one can do with, the better, for the less will its cessation be felt. For getting an exhausted man down it should be invaluable, for here speed is safety. It is a specific for preventing or arresting frost-bite. A liquid oxygen plant at the foot of Mt. Everest may be a possible solution of the problem of weight and relays. For myself, I would like to have oxygen dumped on the top of Everest—and to- use it coming down.

What deductions can we legitimately draw from this year's experience? Obviously Bruce has solved the vital matter of porters, without which no advance was possible. As to the possibility of the ascent, since without oxygen 27,000 ft. has been attained, and since only a further .8 of an inch of pressure remains to be relinquished, surely we can agree that it is quite possible to get to the top. Probably some exceptional individuals will succeed without recourse to oxygen, though even such fortunate mortals would accomplish the feat more easily with oxygen. But I venture to protest that Mt. Everest is not an easy mountain—it is pedantic so to miscall it and not fair to those who will one day reach its summit. The route is straightforward enough—up the ridge from the N. Col to near the N.E. shoulder, below which point I am convinced that I spotted a good camping-place at a little over 27,000 ft. The chief difficulty seems to be the lack of a good coolie camp site between this and the North Col. Along the N. shoulder it may be possible to get a little shelter by clinging to the N. side of the final ridge. On a windless day the snow ridge itself is probably easiest. The last steep slope may be easier on the S. side—if the snow is safe there. But ultimate success depends entirely on the weather, for no mortal man can face a storm on the final ridge of Everest.

To sum up: it does not appear to have been quite realised that the chances of both parties were irretrievably ruined on the day previous to the final assaults by weather conditions which compelled each of them to camp much lower down than they had intended. For neither of these emergency bivouacs could good sites be found and both parties suffered directly from this cause. The First Party were all frost-bitten on the day before their attempt. The Second Party were most severely handicapped through being storm-bound at Camp V. How excellent it is that both persevered in spite of everything. It is not possible to overrate the hardships which these pioneers endured; nor to overstate the satisfaction of the writer in having been present, though the part of a mere spectator has its inevitable regrets.

I gratefully thank several friends, both Alpine and Himalayan, for their assistance in the compilation of these rambling notes. I cannot close without some brief acknowledgment of our debt to the labours of the First Expedition and in particular to Wheeler's admirable survey, accomplished as it was under conditions of such extreme difficulty and continuous hardship.

Mount Robson—1922

By Windsor B. Putnam.

The writer of the story of the second complete ascent of Mount Robson must acknowledge his indebtedness to the man who has written so finely of the first. And it is with a profound feeling of gratitude that I look back upon one of several afternoon hours spent in Colonel Foster's office on the Vancouver waterfront. There, feasting our eyes on a picture of the mountain's spectacular eastern profile, my father and I first determined on the journey that ended so gloriously. Conscious of the dangers besetting the northern peak, Colonel Foster urged a visit to Mount Assiniboine and the region explored by the members of the Alpine Club of Canada during this past season. But his every word was for us an added incentive, inspiring us to an attempt on Robson.

Only second to this personal contact that determined our decision in the matter, was Colonel Foster's aid in providing us with the pioneering data collected by the Alpine Club in 1911 and 1913. The 1914 number of this Journal is a compendium of information concerning Mount Robson and proved invaluable on our trip. Without its help the second ascent of the peak would, in all probability, remain an unattained ideal.

But aside from the information contained and the facts set forth in the Journal, I must digress to express my admiration for the men who laboured so long, who suffered such hardships and dangers, only, in most cases, to meet with no success. Again and again during the three weeks spent on Quatsino Sound before we arrived at Mount Robson, I marvelled at the exploits I was studying so carefully. Even while endeavouring to make out which side of such and such a buttress the climbers passed, I would stop enthralled by the romance of these adventures. Sometimes the attempt by the west arête seemed the most harrowing. Then again some feature of the successful ascent or the attempt from the southwest would astound me and I would again change my mind. These stories, unlike the fairy tales they resemble, have lost none of their charm for me. I am thrilled now at the thought of them. As experiences they far surpass anything I have to set down.

Our journey from Prince Rupert to Mount Robson was marred by the smoke from fires ravaging the interior of British Columbia. At one place where a day or two before virgin forest had lined the track of the Grand Trunk Pacific Railway on either side there was now a burnt area extending for fifty miles. On arriving at Robson station our worst fears were realized. With keen

disappointment we found a dense smoky atmosphere obscuring all but the nearest ridges. The mountain was totally invisible.

We arrived early on the morning of August 3rd. The Hargreaves Brothers, packers and outfitters, have a comfortable ranch house just below the railroad. Here we slept the remainder of the night and arose the next morning to greet our two friends, Messrs. Robert and Roger Dann of Harrisburg, Pennsylvania, who had made connections from Vancouver eight hours earlier.

The railroad passes Mount Robson some seven miles to the south, while Berg Lake on the north, almost at the opposite base of the mountain, is distant seventeen. At Robson Pass, just beyond Berg Lake, the Hargreaves have established their attractive camp, which we made the objective of our first afternoon's journey. Words cannot describe the feeling of awe that overcame us as we approached the mighty uplift, that every step seemed to project further from its smoky envelope. A month before, in nearing Mount Rainier, we had viewed the same spectacle. There, too, a great snowclad summit, hanging as it were in an etherium, had presented an aspect of supernatural loftiness.

A council of war was held the next morning. Jack Hargreaves, who had packed us in, declared he would go wherever we wanted to go and, with myself, advocated instant attack on the peak while the weather permitted. But my father and the Danns maintained the need for first becoming acclimated. The latter alternative prevailed, much to my dissatisfaction, as I realized that it would prevent our friends, who were compelled to leave within a few days, from being with us on the attempt.

There followed three delightful days, during which we climbed Mount Mumm and explored the Coleman and Robson glaciers. On the third, we made a futile attempt to climb Mount Resplendent. It had rained a little the evening before and the atmosphere was clearer. Great masses of vapour still clung to Robson, but we were not deprived of at least a glimpse of the spectacular eastern face, where the mountain becomes pre-eminently the peak. Now and again the lofty, forbidding spire appeared for a moment, riding the clouds.

On the fourth day we unwillingly parted with the Danns, who exhorted us to perform successfully our "one very grand duty," to use Conrad Kain's quaint phrase. That afternoon my father, Jack and I made ready for an early start the next morning. I must not neglect to mention the kind service rendered us by Mr. H. P. J. Lambart of the Geodetic Survey of Canada. Had it not been for his willingness to lend us two ice axes and an alpenstock, our ascent would have been delayed a week, or even prevented entirely, as our own equipment had been held up in the Vancouver Customs office.

Dawn, the following morning, showed an unpromising sky, with light, high clouds, pink in the sunrise. We did not stop to worry, however, but were on our way by six o'clock. After rowing the length of Berg Lake in the Hargreaves' boat, we crossed the top of Chupo glacier and climbed directly to the first of the three ledges of sloping scree that form prominent bands around the northern base of the mountain. The going is steep and unpleasant for the first few hundred feet, as the grounds seems to be cemented together with some peculiar clay ingredient, that gives it a hard, slippery surface. But, on reaching the 6,500 foot level, one can travel along the terrace until the west ridge of the north face is rounded and one strikes a large couloir giving- access to the second ledge one thousand feet above. This chimney is steep and at first uninviting, but entirely safe if those in advance avoid dislodging rocks.

Under the vertical cliffs, streaked with black and yellow, that top the couloir and form the retaining wall of the third terrace, we stopped to take lunch. It was almost noon; we had made poor

Southwest Face Of Mt. Robson. Photo, J.H. Chapman
First Night X. Second And Third Night Xx. Record Left In Rock O.

Showing Route Of Ascent From Berg Lake To West Face. Photo, J. Hargreaves

time. My father, a man of nearly sixty, though having ambitions of a person of twenty, found the climbing arduous. And we all felt the weight of our packs. Rations, bedding and firewood had been cut to the minimum for a three day trip, but still contrived to press heavily on our shoulders. The view, though largely obscured by smoke, still had impressive features. Prom our elevation we could look back and down 2,000 feet upon the pale waters of Berg Lake. Directly across the gorge of the Valley of a Thousand Falls,, the massive uplift and sharp point of Whitehorn were discernable. In spite of the haze, by its mere proportion and outline, it made a distinct impression.

From our lunching place, a short skirting of the wall brought us to the first breach, by which we ascended to the third scree slope. This last climb is wholly unnecessary as the second terrace merges with the third to form the vast rock slides of the western face. In fact the extra few feet force one to descend later on when crossing the moraine, below the small hanging glaciers, just north of the west arête. It is easiest to remain at the base of the great scree slope the entire distance, maintaining an approximate elevation of 7,800 feet.

A short climb from, the "basin" of the west face brings one onto the west arête. In continuing the circuit of the mountain, it is wise to choose a band and stick to it. Of the two available at this level, the upper and narrower one is preferable. There are many curves on this part of the route. Many ridgelets must be skirted, many promontories rounded, before one obtains a full view of the south face of the peak. And what a surprise it was when we finally did obtain a first glimpse! Accounts had led me to believe that this south face would present a gradual aspect. I had even been rather impressed with the comparatively gentle slope of the west face, the one climbed by Kinney and Phillipps and the approach classed by Kain as "most dangerous" of all. I imagined that, if once the initial scarp could be surmounted, the rest of the climb would prove easy. What was my astonishment then, to round the west arête and confront gaunt battlements, that seemed to tower perpendicularly, the blackest and most forbidding of all. The "great" couloir of the south face, which I had pictured as some deep gorge, had contracted to a mere streak of ice on the wall, dropping off, in the direction of Lake Kinney, to unfathomable depths. And farther still, beyond the parapets of rock, way up into the mist that was beginning to descend from an ever more threatening sky, appeared a white expanse, blanched to an incredible degree of whiteness, the formidable summit ice cap. And there were several séracs too, some of the '' white cowled monks,'' beckoning it seemed, with ghastly lure urging us to a summit unattainable. I was a little in advance of the others and instinctively I drew back. I was in the presence of something great, something terrible, and in an instant I felt myself peculiarly alone.

It was now late. The weather promised storm and the bands we were following attained an ever steeper angle, as if they were trying to slide us sideways into the valley 5,000 feet below. When we reached the couloir and found a level promontory, with a supply of water close at hand, we were ready to give up our plans of rounding the southwest arête and camp for the night. A singular growth of moss covered the shoulder we had selected, prompting my father to name it "Moss Bench." After a good supper, we prepared a sleeping place, sheltered it with a few rock slabs and strung a waterproof poncho over the bed. It was a snug nest and we were as comfortable as we could be, considering that we had but one blanket between us.

At four o'clock the next morning, agreed starting time for the final encounter, Jack poked his head out from under the igloo. It had snowed very slightly during the night. Worst of all, the crest of the peak was enveloped in cloud. Two alternatives presented themselves. Either we might ingloriously turn back and postpone our attempt, or we might economize our food, wait until the following day and pray for fair weather. Half an hour decided this question. We got up, cooked

and ate breakfast, shouldered our packs and set out around the southwest arête, with the object of making camp at the head of "Lake Kinney Valley."

We climbed leisurely and at about ten o'clock reached the foot of the main glacier of the south face. Casting, about for a suitable camp site, we finally made a unique selection. Under the slightly overhanging mass of rock, that forms the capping of the easternmost ridge of the southwest arête, we chose our spot, not more than 200 feet directly across from the rugged ice wall of the glacier's terminus. Here, to the thundering of breaking ice blocks hurtling their way down the huge couloir below us, we levelled the slope, constructed low walls and did what we could to render homelike our rocky surrounding. As the scree manifested an unmistakable tendency to slide out from under, we installed three slabs of stone as doorsteps and even built a little trail running around to the crest of the ridgelet.

The work finished, we christened the camp "Berg Perch" a name forced upon my father by the enormous and fantastic blocks of ice, that seemed almost to overhang us. I do not think future parties will have much difficulty if they wish to locate this spot. It is certainly a spectacular camp site and at the same time proved quite satisfactory. Water is close at hand just around the ridgelet and the only drawback seems to be a cold wind that comes from the surface of the glacier. For those, however, who are bent on altitude, a camp at an even higher elevation, say 9,500 feet, would, I believe, be feasible. The only requirements are willingness to carry packs up increasingly steep slopes and to level off some shelf as a sleeping place.

We at Berg Perch, huddled together, our bodies against the rock, spent a wakeful and expectant night. As some noisy avalanche would crash over the wall of the glacier, all three of us would sit up simultaneously to watch the tumbling, bounding, whitish masses hurrying to the valley far below. How uncertain did Jack and I feel that on the morrow we would, in one day, retrace the course of these avalanches, following the broken, cascading glacier to its source at the very summit of the peak.

Anxiously we peered out in the early morning hours. It had snowed. A white film four inches thick covered the rocks. Still at times an open starry sky gave promise of fair weather and dawn disclosed a clear atmosphere; the storm had temporarily removed all trace of smoke. As far as the eye could reach enormous banks of billowy clouds enveloped the crests of ridge after ridge of the Rockies. Underneath was revealed a veritable vision of the Fraser River Valley, the green of the distant forests, lighted here and there, in patches, by the first rays of the sun. It was as if some good angel had, for a moment, raised the corner of a fantastically folded curtain, and we were allowed to look down from our bleak height on fairyland. But always the clouds were approaching. Robson's summit was never free of mist and, as each great bank rolled up the slope, our panorama temporarily vanished.

Should we attempt it? Should we risk a final encounter? Jack and I thought yes. And then came a question never explicitly decided. Should my father accompany us? It was his own insistence that we go alone, which settled this grave doubt. "Game" to the last, his only reason was the fear that he might, in uncertain weather, prove a drag.

Our climb started with some show of confidence. The late afternoon hours of the previous day had been devoted to reconnoitering the first thousand feet of the southwest arête and we had found it steep, but quite free from danger. This first part of the ascent thus went quickly, but we did not make more than twelve hundred feet in the first hour. The fresh snow, of which we naturally found more the higher M£ went, was an impediment and formed slippery clogs on the bottoms of my boots, which I had foolishly equipped with sharp caulks, in anticipation of smooth ice. We had,

moreover, penetrated the dense cloud of mist that clung to the summit and from then on it was only an occasional rift that enabled us to see more than one hundred feet in advance. But there was not much danger of going astray! When we had reached the top of the east ridge of the arête, the edge of the glacier forced us to the left.

Progress became slower from then on. At one place we were compelled to cut ice steps to get around a projecting rock, an expedient which we used more than once later on. The second hour found us only eight hundred feet higher. Although we did not know it at the time," we were on the summit of what might be called "Black Pyramid." This colossal projection, that gathers all the ridges of the southwest arête into one mountain on a mountain, was none other than the "gaunt battlement" that had so appalled me in rounding the west arête. It has its maximum relief when viewed near Lake Kinney. Anyone who has been there will remember its sharp, though massive, bulk piercing the sky as a distinct peak.

What next? That was the question that perplexed us as we stood on this second "landing" of the arête. As far as we could see, we were marooned, for the mountain dropped away on every side. "An Ascent of Mount Robson from the Southwest" did not help us at this point, for there was no mention of having to descend on the ascent. Fortunately, just then there was a rift in the mist. Directly ahead appeared an ice saddle connection "Black Pyramid" with the main mass of the mountain. There was no difficulty in availing ourselves of the route, for what had appeared a drop-off was but a gentle slope. On the other side, however, the rise was more pronounced and fifty ice steps had to be cut before we were again on solid rock.

At the end of the third hour we were under the great overhanging ice rampart that proved so ominous a barrier to the party of 1913. That this is an inherent danger of the route is unquestionable. We were, however, favoured with a lateral rift in the vapour at this point, that allowed us to pick the safest way. By working to the side at the first opportunity, on some of the numerous rock ledges, danger can be pretty thoroughly confined, I should say, to a space of five minutes, when the wall is first neared and another brief minute, while one dashes across the main couloir that leads directly up to the ice. It may be, of course, that during the whole hour, from the time we reached the glacier, to the time that we were again near the crest of the arête, we were subjected to constant danger from ice that we could not see. Inspection of a rather clear picture of the south face of the mountain, that I have before me now, makes this seem possible. But all that I can. say is that, at the time, it did not produce that impression. Real danger, I repeat, seemed to be confined only to those brief minutes, when with scattered chunks of ice on every ledge, we were in the immediate path of avalanches.

In working from the glacier to the crest of the arête, it is expedient to keep well to the left, gradually climbing from ledge to ledge. Otherwise, one will find oneself on the surface of a rounded ice slope, too high to make descent worth while and too precariously placed to dispense with the time-consuming process of step cutting. My own progress was very slow. The danger of slipping from the snow laden ledges, with the clogged condition of my boots, together with fatigue from two sleepless nights, made climbing in the thinner and thinner air, an arduous undertaking indeed. It was ten o'clock before Jack and I found ourselves high on the crest of the southwest arête.

The most disheartening stage of the ascent was at hand. Crawling up the sharp edge of the arête, with bottomless abysses dropping away into the great couloir of the south face, our range of vision had narrowed to a radius of fifty feet. The wind had freshened, and, with the first fall of snowflakes since the start of the climb, I abandoned all hope of success. Not so Jack! He insisted

on pushing ahead, until at eleven o'clock, with just enough snow in the air to make further progress unwise, we again confronted the glacier, completely and for the final time overlapping the crest of our ridge. With one accord we called a halt and, brushing away the snow, squeezed ourselves down beside the last big rock on the arête. We had already partaken of chocolate and speedily completed our meal with a couple of sandwiches and some raisins.

It was indeed a dismal prospect. Very shortly we were forced to get up and stamp around to keep warm. And as we stamped, argued. Viewed in the light of past experiences on the mountain, I endeavoured to explain to Jack what folly it was to waste even a moment. We ought to go back, I declared. But he would hear none of it, and serenely proceeded to exhaust his stock of jokes and anecdotes. Each story he would punctuate with the assurance that it would clear. Two hours we stamped away and then little by little it did clear. The wind died, the snow ceased to fall and for one moment a ray of sun penetrated the mist, Jack want ahead, started to cut steps and at one o'clock I followed, never dreaming of success, but willing, nevertheless, to get as far as the party of 1913.

It was but a little after two when we reached the base of the formidable summit ice cap and caught our first glimpses of the fantastic snow formations described so picturesquely in former accounts. There were the ostrich plumes, long icicles covered with exquisitely delicate feathers of frost! Hanging from the twenty foot wall that forms a rampart around the cap, they presented a glistening array, coldly beautiful, sublimely frigid.

Our first impulse, on reaching this last lap, was to bear to the right. The ankle of the slope below the rampart is here gradual, forming a sort of avenue around the summit. But as we continued to the right the wall grew higher. I began to feel that, with the mist encompassing us, it would be wise, after all, to try the smooth, hard ice slope, directly above the southwest arête. This was the route rejected by the party of the first ascent on account of the strenuous step cutting involved. But coping with the nasty séracs and ice ledges described by Colonel Foster and Conrad Kain would, I was sure, produce confusion and loss of time. Accordingly we retraced our steps, following along under the weird bulwark, until we had passed our starting point and were on the brink of the great couloir. The wall was lower here and at a point only ten feet high we encountered no difficulty in cutting our way up over it. It was the final assault! We were on the summit ice cap! A bleak expanse of sloping ice with barely a film of snow to cover it, stretched on up as far as we could see.

One hundred and seventy ice steps cut and we were again on a firm layer of snow! All credit for that part of the climb belongs to Jack. His stamina and endurance alone made possible the arduous process of step cutting. Never on the summit of a first class peak before, he proved himself, none the less, a thorough mountaineer. To his splendid companionship, more than anything else, I attribute the success of our whole exploit.

On reaching the base of the cap, we had roped up for the first time. I remember, vividly, crawling along the crest of a precipitous ice ridge and hearing Jack shout, '' If I fall on one side, you fall on the other and we'll stick!" But I must confess that I am not thoroughly convinced of the safety of roping on long stretches where there is firm foothold for no one. The sportsmanlike ideal of '' one go, all go" is not founded on better judgment.

Meanwhile our hopes had been fictitiously buoyed up by our aneroid. It now registered approximately 13,200 feet, but where was the top ? We were no longer on the smooth ice, to be sure, but the grade had hardly slackened and still we laboured upward. At an indicated altitude of 13,500 feet a ghost like wall with more pendent "feathers" loomed up out of the mist ahead. More strange ice formations appeared on our left and we were forced farther to the right. The extreme elevation recorded by the barometer, together with the sense of having climbed a long distance

made us sure we were near the crest. Had it not been for the forbidding wall, we would have considered the day already won.

Just as we reached this second rampart, a small chimney opened to our left between two buttresses of ice. Up this we scrambled and at four o'clock found ourselves on the crest of Mount Robson. We were directly beneath the overhanging upper end of the wall and were never in such danger as during the five ensuing minutes. Our only route lay around the end of the wall. We were compelled to jump down and traverse a broad depression filled with blocks of ice of all sizes that had tumbled from the ledge above. In the streaming vapour, the summit of Robson, with its great white bulwarks, proved a perplexing maze. On rounding the wall, we found ourselves between it and another ridge, in a narrow defile. But at the end of this passage we beheld a third great snow rampart, which with a thrill we took to be the summit itself. Only a great broken crevasse cut us off from our objective. To avail ourselves of the one slim snow bridge, we had first to cut our way down to it and then, on the other side, to clamber up the steep, crevassed slope. With a shout we rushed to the highest point!

But alas! Grimly, disapprovingly, frowning down at us, with its hoary beard of icicles and frost, loomed the second ridge. It was the one that had formed the other side of the defile and now proved the highest of all. One question flashed through both minds! Would there be another bridge crossing the crevasse? Eagerly running along our causeway, which for one hundred yards, in an easterly direction paralleled the true summit, we came at last to the end of the ridges. They joined! Scaling the inclined snow bridge forming the connection, we bounded back a few yards and at a quarter to five clasped hands, in mutual congratulation, on the highest summit of Mount Robson.

The aneroid read 13,600 feet. While I have no way of accounting for this discrepancy between our instrument and the ascertained height, of one thing I am sure. It is more than five hundred feet from the base of the summit ice cap, as defined in this paper, to the top of the mountain. Eight hundred feet impresses me as a moderate estimate.

But it was late! An anxious father was waiting in camp 5,000 feet below and there was no view to be had. We did stop long enough for one thing, however. Through my father's sentiment, three small flags: the French, the British, the American had found their way to that stern height. Jack planted the British, I the American and together we thrust home the French. A dark, frosty figure, three fluttering bits of colour, in the mist, the white of eternal snows! It is a picture graven on my memory.

An hour sufficed to bring us again to the foot of the summit ice cap. Our steps, although filled with ice chips and snow, were intact, one kick being sufficient to rid them of their debris. I thought my right arm would wear away from constant bearing down on Mr. Lambart's trusty ice axe, but, on the whole, the descent was decidedly less taxing than we had anticipated. Most glorious of all, as we started our long plunge down the southwest arête, the vapour suddenly rolled away and I found myself looking out on my first and last unbroken panorama of the Canadian Rockies. Extending away for miles, ridge after ridge of virgin mountains appeared. Every crest was white, save where projecting crags blackened the otherwise even expanse of snow. And turning, we had close at hand the iciest of spectacles, Robson 's frigid summit. So superlatively white was it, that lovers of the peak must pardon me, when I tell them it looked artificial, like some huge wedding cake, just reeking with the purest and most glistening of frostings.

Down! Down! Down! As we struck the highest rocks of the arête, we were again submerged in fog. At the last prominent boulder, where but a few hours earlier, we had stamped out our dismal vigil, we left a brief memorandum of the expedition in a George Washington coffee can. On the

summit of "Black Pyramid" we were once more free of mist. Two thousand feet below, tramping back and forth on the crest of the ridgelet a tiny figure was visible. "Hey Pop!" shouted Jack. A faint response was audible. We did not wait. In one more hour, just as it was getting dark, three hours and a half after leaving the top, we were warmly welcomed home to "Berg Perch."

That night was the most disagreeable of all. It snowed more than ever and on the return we were shrouded in vapour almost the entire journey. Three exhausted travellers, nourished that morning with only an all-raisin breakfast, stumbled in at three o'clock to the Hargreaves' camp on Robson Pass. We had spent three nights and four days on the side of the mountain.

On our climb we had to face no such weather conditions as were encountered on the unsuccessful attempts. Above all, we were spared the biting blast of a high wind. It was never unbearably cold. We were hampered, to be sure, by the fog and by a fresh, loose fall of snow. But the latter obstacle was at least compensated for by the dryness of the season and the consequent general lack of snow remaining from the winter. As to inherent difficulties of the route, ice can be considered by far the worst. The rock work, owing to the peculiar stratification of the peak, is surprisingly easy. Step cutting, while not to be compared in extent with that undertaken by the party of first ascent, approaching from the east, is none the less, an item. (We cut 325 in all, 178 of which were on the ice cap.) But actual danger in superlative form is encountered only during the few minutes when passing under the walls of ice both midway and at the summit. There alone is one wholly in the hands of fate.

To conclude, I have no doubt but that this southwest approach furnishes, if not the safest, certainly the most expedient route. Yet, given another chance to "take on" mighty Robson, I'd try Kinney's trick. I would examine that "gentle" western slope. And, if lucky, I would make the acquaintance of the white cowled monks, some of Prouty's "gargoyles," way up there in the fastness of the snows, the eternal snows, that claim Mount Robson's arctic summit for their own.

Mount Geikie[6]

By C. G. Wates.

Puns are the cheapest form of humour. Despite this dictum I have had a pun upon my conscience which is now set forth for the first time and the manner of its birth was thus. One summer morning ten years ago a little party passed through Jasper on the way to Mount Robson, a district then almost unvisited. It was their first glimpse of the Canadian Rockies and in the mind of one of them Jasper was henceforth "J'espere". A decade was to elapse before hope blossomed into realization but the hope lived on, fed by tales of such wonder spots as Tonquin Valley and the Circus, Maligne and Fortress Lakes, the rock cliffs of the Ramparts and the ice fields of Mount Edith Cavell, until one morning I awoke to look out upon the Athabaska, a river of quicksilver, the crests of its ripples turned to elfin gold by the rays of .the rising sun, its distant reaches winding their way into a soft blue haze of peaks, like a mysterious road leading into the fairyland of heart's desire.

A glance at the map in the guide to Jasper Park published by the Department of the Interior, will show that Mt. Geikie rises to the height of 10,850 feet at the western extremity of the Ramparts,

6 To Dr. H. C. Bulyea, my companion (I had almost added, "in misery") has fallen the pleasant task of describing the trials and delights of our journey into the Geikie Valley in the Summer of 1922. My duty is to write of the great rock peak upon which we expended all our energies—and failed. If it be said, why record the story of a failure? I would offer the excuse that such a narrative may be of value to those who follow after, enabling them to avoid our errors and profit by our investigations.

seventeen miles southwest of the town of Jasper, but nearly forty miles by trail. To make a homely comparison, the Ramparts are like a train of giant freight cars, of which Mt. Geikie forms the locomotive and Mt. Barbican the cow-catcher. The camp from which Dr. Bulyea and the writer made two attempts upon the peak, was situated about the point marked by the letter "U" in the map referred to.

Mt. Geikie is a supreme example of a Canadian rock peak. Rising to a height almost equal to that of glacier-hung Mt. Edith Cavell, it bears upon its extreme summit a cap of ice, but aside from this and a few snow-filled couloirs on the southeast face, Geikie's mighty cliffs are entirely bare, unless we include a small tributary ice stream which feeds a glacier on the northern slopes of Mount Barbican.

Roughly, Mt. Geikie forms a three-sided pyramid, its faces lying north, west and southeast. In our preliminary reconnaissance, we passed entirely around the mountain at heights varying from 6,500 to 7,200 feet, with the exception of the col between Mt. Geikie and Turret Mountain to the east. Mr. A. O. Wheeler, whose advice proved invaluable throughout our trip, had summed up the north face in one word—"impossible"—and our view of it as we tramped down the valley of Tonquin Creek into British Columbia, amply confirmed this verdict. The black cliffs rise smooth and unbroken from base to summit, like a great wall, and although, after reading Harold Raeburn's comments on the exaggeration of the steepness of rock faces, one hesitates to express an estimate of the angle in degrees, I do not think that anyone seeing this splendid face from the north will question the correctness of the classification, '' unclimbable."

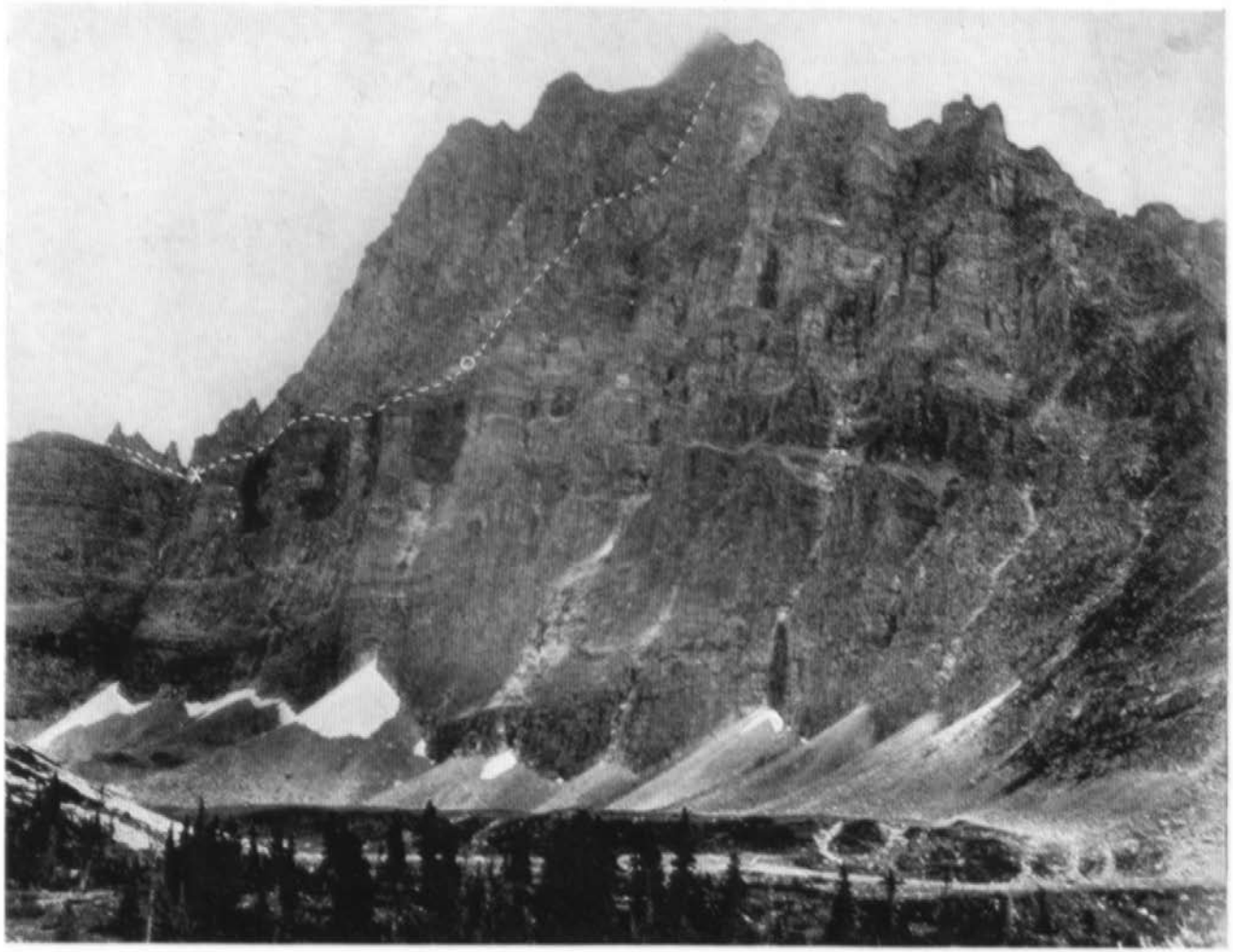
The west face, below which we camped, resembles the north face in being almost flat and very steep, but it is more broken in character. The lower portion consists of vertical cliffs, slightly buttressed and terminating at a height of about 9,000 feet in a more or less continuous ledge which we referred to as the '' Great Traverse." These cliffs and the traverse are plainly visible in the photograph of the west face accompanying this article. High up, the west and north faces meet in a smooth and tremendously steep arête which, lower down, eases off in a series of gendarmes and buttresses to the Geikie-Barbican Col at an altitude of about 8,100 feet.

The southeast face is by far the most rugged and broken part of the mountain. Two great gorges cut into the heart of the peak, each carrying at its foot a black tarn, surrounded by precipitous cliffs. These are the lakes which Dr. Bulyea has described under the name of the Ink "Wells. Between the west and southeast faces is the south arête, which has weathered to such an extent that a great slide descends through the forests right down to the floor of the Geikie Valley, 2,000 feet below. Between the two gorges is another arête, the southeast, and between the east gorge and the north face is another very steep arête, running down easterly to the Geikie-Turret Col. This concludes the circuit of the peak and our observations showed three main facts; the impossibility of the north face, due to its smoothness, the doubtfulness of the west face, except as a last resort and the attractiveness of the deeply eroded gorges and arêtes of the southeast face.

Our optimism was somewhat damped by a curious phenomenon, that all the arêtes are deeply notched at an elevation of about 9,500 feet, making a direct attack impracticable, but we ultimately decided to circumvent these notches by following a snow-filled couloir in the western gorge, hoping in this way to reach the arête at a point above them. This failing, we reserved the steep west face above our camp for a second attempt.

The First Attempt

On the evening of August 7th we rolled ourselves in our blankets at a bivouac camp on the



West Face Of Mt. Geikie, Showing Route Of Ascent. Photo, H.E. Bulyea
Crystal Beds X. Snow-Patch At Foot Of Arete O. Geikie - Barbican Col Just Left Of Picture.

shores of the western Ink Well. The full moon floated in a clear sky and all promised well for the morrow. We planned to rise at 3:30 but when the alarm waked us it was still pitchy dark. So we snatched another hour of sleep and left camp at 5:30 skirting the west shore of the lake over great rock-slides and reaching the foot of the snow fan below the couloir at about 6:15. Easy progress up the snow talus made us optimistic but our hopes were sadly dashed upon entering the couloir, for the snow proved to be badly crusted, making it necessary to use the axe at every step and calling for more care with a party of two than would have been necessary had the snow been in good condition. The couloir is winding and steep, while down its entire centre runs a U-shaped trough carved out by the rush of falling stones from above. At two points we were crowded to the walls of the couloir by this trough and were obliged to cross it; no easy task for two. The trough was about twelve feet deep and twenty wide with perpendicular walls; a place where deep steps and careful anchoring were at a premium. Fortunately the day was yet young and the stones slept.

At about 8,700 feet the couloir became steeper and the snow changed to ice. Luckily, the rocks on the east side, which had hitherto been smooth, became more broken at this point and we attacked them, alternately climbing and traversing on steep, solid rocks until at 12:30 we reached the top of the couloir, well above the last notch on the southeast arête.

We were standing in a col formed by the junction of the two gorges and we were surrounded by scenery, wild and savage in the extreme. Looking down the east gorge we could see the eastern Ink Well, like an oval of black glass. Directly facing us rose the last thousand feet of Turrett Mountain, closely resembling the well-known Watch Tower in Cataract Valley. Beyond, through a haze of smoke, shone the snow-fields and glaciers of the group known collectively as Mt. Fraser.

Turning once more to our task we attacked the broken cliffs and shelves of the east arête. Our progress though slow was continuous until we encountered a gigantic block of stone, perched on the arête and split from top to bottom, the upper part of the cleft being jammed by several chock-stones. The cleft was just wide enough to admit us and was backed by steep ice. Having cut my way to the top of the ice, I was still far below the first chock-stone. Here I spent half an hour of fruitless struggling between the smooth walls and at last retired baffled and exhausted to give the Doctor a chance to try his luck. While I rested, I was treated to as pretty an exhibition of knee and back work as anyone could desire and ten minutes later, aided by a friendly haul from above, I joined the Doctor on the first chock-stone. From here our work was easy until we emerged from the crack to find ourselves on a ledge overhanging the Tonquin Valley which lay four thousand feet below us in all its beauty. Now, if ever, we anathematized the dense smoke obscuring a view which would have extended to Mount Robson and perhaps beyond to Mount Sir Alexander.

We had been forced out on the north face and to regain the arête it was necessary to make a short traverse over a little ledge of snow plastered precariously upon the rock wall, which overhung about four feet above the snow, making it impossible to stand erect, so having scooped out a channel with our axes, we lay down and crawled across, passing over holes in the snow ledge through which we could catch glimpses of the valley and Moat Lake far below. We were unpleasantly aware of the steepness of the north face.

Again we followed the arête and at last stood at the foot of the summit mass. The watch read 6:15, the aneroid 10,300 feet, and we were confronted by sheer, smooth cliffs, black with running water from the ice cap above. On the right was the impossible north face; on the left a series of descending ledges broke away to the south arête. To try the latter route would involve a long descent and far more time than we had at out command and without any assurance of success. Regretfully we turned back and, unroping, began the descent with all the haste that safety allowed.

Darkness was drawing on as we reached the Col and a flurry of snow warned us that a night on the mountain would be anything but pleasant.

We roped and continued the descent, hoping that we could reach the couloir before it became too dark to see our route and with the expectation that we might make our way down the steep snow by aid of the moonlight, but at 9:00 o'clock it was so dark that farther progress would have been extremely hazardous for the last man on the rope. We selected the only possible place to spend the night: a ledge so narrow that lying with our heads against the cliff our feet overhung the ledge.

Neither of us will soon forget that night. Fortunately the snow flurry had proved a false alarm but we were at 9,000 feet altitude and the wind blew keen and bitter up the couloir. The first hour was spent in collecting all the loose stones we could find and piling them up to form a little wall a couple of feet high and enclosing a space no larger than a dining table. Here, roped to a projecting crag, we snuggled down and tried to sleep, only to be awakened by the clatter of rocks as one of us straightened his legs and pushed a portion of our wall into the gulf below, an accident not unwelcome, since it gave the excuse for some added exercise in rebuilding the barrier more securely. For fifteen minutes in the hour we would doze and then wake shivering to sit up and engage in violent but restricted motions to arouse the sluggish circulation. Our surroundings added to the strangeness of the experience. The black cliffs fell away into mysterious gloom. Far below, we could see the faint outlines of the snow; while facing us, a portion of the opposite couloir-wall was lit with a ghostly radiance by a yet invisible moon. In this lighter space loomed what seemed to be a black cave containing a figure which the Doctor stated was his Satanic Majesty gloating over our sufferings.

And yet—so unaccountable is human nature—when we woke from uneasy slumber to find the sky greying with the first promise of day, we stretched our stiffened limbs and began the descent with a feeling that was almost regret at leaving the perilous ledge with its little wall which had been our home for the night.

An hour brought us to the snow and, having doubled our hundred-foot rope for added security, we began the descent. The procedure was this: Each in turn would cut a large step and anchor, belaying the rope around a buried ice axe while the other man descended. Once we tried glissading the length of the rope, but the bad condition of the snow and the sudden jerk of the rope soon made us abandon it. We were in no mood for talk and for hours our conversation was confined to: "End of the rope!" from the man above, and ''all right, come ahead,'' from the man below.

At last we emerged onto the snow talus and unroped. A wild glissade, followed by a tramp over the boulders by the lake shore, and we reached our bivouac at 11:30 having been on the mountain exactly thirty hours.

The Second Attempt

Our permanent camp being situated within a few hundred yards of the cliffs of the west face, it was natural that the various features of that aspect should occupy much of our attention and such phrases as "The Great Traverse," "the Snow Patch," and "the Geikie-Barbican Col" were constantly coming up in our conversation. Even at such close range the dense smoke almost obliterated all detail and a proposal to ascend Mt. Barbican, in order to make a closer study of the upper part of Mt. Geikie, was vetoed for lack of time.

As far as we could make out, the portion of the west face lying above the buttressed cliffs is practically smooth, with the exception of one shallow couloir, but whether this couloir is bounded

by distinct arêtes, we were unable to distinguish. The only snow on the entire face lay on the Great Traverse at the bottom of the couloir and was known by us as the Snow Patch. The problem finally simmered down to this, could we reach the Snow Patch and if so would any practicable route present itself from there to the summit? The only answer to these problems was to go and find out for ourselves.

Two days after our first attempt we left camp at 5:30 and made our way over grass slopes and rock slides towards the Geikie-Barbican Col. The buttress to the east looked impracticable, so we bore to the right before reaching the col and, roping up, tackled a succession of pitches and traverses, aiming always at the foot of the gendarmes which are plainly visible in the photograph. Our choice of route was unfortunate as we wasted two hours of valuable time, being finally driven back to the col. A traverse of the north face then became ours by choice of necessity, a choice which proved in the event a happy one, affording us some very interesting climbing. After climbing some easy rocks we came to a fairly steep piece of ice, the tributary to the "Barbican" glacier of which I have previously spoken. At this point the ice stream is about v eighty feet wide and step cutting cost us an hour's time and a mass of broken blisters. We were using a sixty-foot rope, which necessitated our being on the ice together, a fact which had a sinister significance in the light of later events.

Once across the ice, we made our way up a series of chimneys until, at about 11:30, we reached the foot of the gendarmes and, sitting upon some great, flat slabs in the sunshine, we indulged in a second breakfast.

Much as we regretted the loss of time in trying to climb the south side of the buttress, we were well satisfied with our progress. The end of the Great Traverse lay before us an easy route to the Snow Patch, and now that we could see the west face in partial profile we began to have great hopes that it would go.

Starting again we skirted the two gendarmes, one of which has a rectangular window pierced in the upper part, and stepped upon the end of the Great Traverse, which runs like a giant wagon road around the west face above the buttressed cliffs. At this point we made one of the most interesting discoveries of our whole trip. A great ledge of pure white, milky quartz lay exposed to sight, glistening in the light of the noonday sun. Presently, among the debris, the Doctor picked up a little rock crystal like a hexagonal pyramid of clear glass and about as large as a man's thumb. There was nothing very remarkable in this, but, a moment later I found another equally perfect and weighing over two pounds. This crystal lies on my book case as I write and its facets cover my extended hand.

But the Doctor, not to be outdone, discovered another crystal fully thirty inches in circumference and later we unearthed two others of equal size. For the most part the ascent of the mountain was forgotten in admiring these gigantic gems and we determined that the finest of them should repose in the Club House at Banff.

Having placed our specimens where they could easily be found on our return, we followed the Great Traverse to the Snow Patch, which proved to be the usual pile of dirty debris, half snow and half ice, left from the avalanches of the previous spring and undermined by a little stream flowing down the couloir. But what interested us far more than the Snow Patch was the fact that to the south of it rose a distinct arête, tremendously step but perfectly practicable.

Now followed more than a thousand feet of really grand rock climbing. We had encountered uniformly good rock upon Mt. Geikie, firm and solid with no trace of rottenness, but this little west arête will always stay in my memory as one of the most enjoyable climbs in my experience. Alas,

that it was not to prove the key to our hidden treasure house!

As we climbed higher and higher it seemed as though we could reach out and touch the summit which loomed up through the haze on our left. But suddenly, when within 300 feet of our goal, after climbing a particularly steep pitch we halted on a ledge and faced another pitch, perpendicular for fifty feet and actually overhanging at the top. The arête had narrowed to a knife-edge with vertical faces and it was forward or nothing. And the verdict was, "nothing."

Many times since, I have looked back and wished I could stand on that ledge again. The fact is that we were both worn out with the constant strain of difficult climbing. There had been hardly a moment throughout the day, with the exception of the Great Traverse, when the use of hand-holds could be dispensed with. We were confronted with the most difficult pitch at a time when we were least able to deal with it, and I have the feeling that under more favorable circumstances our opinion of its impossibility might be reversed. If so and our route proves a feasible one, the climb of Mt. Geikie by the west face will be one of the cleanest and sportiest rock climbs in the Rockies.

Our return by the arête was marked by an incident so disgraceful that I should hesitate to describe it, but for the fact that memory assures me that I am in good company.

I must explain that we had donned our tennis shoes before tackling the arête and that Dr. Bulyea, whose rucksack was somewhat small, had given me one of his boots to carry. As I descended the last pitch to the Great Traverse it was necessary to face out and my bulky ruck-sack embarrassed me. Slipping out of the straps, I passed it down to the Doctor. How it happened neither of us know, but next moment I helplessly watched the precious sack rolling slowly across the shaly slopes of the Traverse until it vanished over the cliffs into the valley.

As the rucksack disappeared I had a vivid mental image of eighty feet of sixty-degree ice to be covered in tennis shoes with a sixty foot rope.

"We paused at the crystals long enough to convince ourselves of the impossibility of carrying even one without a rucksack and then continued past the gendarmes and down the buttress. We had been doing some deep thinking and when we reached the ice I had about made up my mind that it would be necessary for one of us to go out and excavate a huge '' step'' at the centre, in which he could stand securely anchored, while the other crossed over. But the Doctor voted for an attempt on the rock wall first and with the aid of his single boot we crawled up the edge of the ice, climbed a little chimney, traversed a narrow ledge and emerged at the top of the ice, which we straddled and rode across arriving at the col just as the light failed us.

We stumbled down the last thousand feet of rock slides in the dark, reaching camp at 11:00 o'clock.

The result of our two attempts on Mt. Geikie may be summarized as follows: The broken southeast face would probably offer several alternative possible routes to the summit mass but it remains very doubtful whether the last 500 feet can be climbed from this side. The west face, on the other hand, presents no apparent difficulties at the summit and the quality of the rock, freedom from snow and directness of attack all combine to make it by far the more attractive of the two. Good luck to the next assailants of this noble peak.

The Freshfield Group, 1922.

By J. Monroe Thorington.

The Freshfield Group[7] is situated on the Continental Divide in Latitude 51°, 39', 51"; about sixty-five miles of travel with horses is required for reaching the group from the Canadian Pacific railroad. The chief peaks lie on the Divide, between Howse and Bush Passes, the crest, of the range bowing southward and surrounding the Freshfield icefield, about twenty square miles in extent; subsidiary ridges extend east and southeast to enclose large glacier cirques, the Conway draining to Howse river, while the Lambe, Cairnes and Mummery streams drain into the Blaeberry. West of the Divide, the Campbell icefield forms a chief source of the south fork of Bush River.

Howse Pass, 5,010 feet, was crossed by David Thompson[8] as early as 1807 and the route was long made use of as a means of communication between the Kootenay Plain and the Columbia Valley. The first mention in literature of the Freshfield Group is made by Dr. Hector, of the Palliser Expedition, who visited the icefield while searching for the northern approach to Howse Pass. He says[9]: ". . . after five miles through very thick woods, we suddenly emerged at the foot of a great glacier which completely fills the valley, and showed us that there was no hope of getting through with the horses by this route. We ascended over the moraines, and had a slippery climb for a long way to reach the surface of the ice, and then found that it was a more narrow but longer glacier than the one I visited the previous summer (i.e. the Lyell). The upper part of the valley which it occupies expands considerably, and is bounded to the west by a row of high conical peaks that are completely snow-clad. We walked over the surface of the ice for four miles, and did not meet with many great fissures. Its surface was also remarkably pure, and clear from detritus, but a row of angular blocks followed nearly down its centre. Its length I estimated at seven miles and its width at one and a half to two miles.... For three miles we followed up the stream to the south, till we found that it suddenly rose from a glacier in a high valley to our right. (This is the present Conway glacier.) However, as the valley before us continued to look wide and spacious with a flat level bottom covered with dense forest we left the river and continued a southerly course. ..."

In 1897[10] Collie and Baker, with the guide Sarbach, visited the group, making a partial ascent of Mt. Freshfield and naming the peaks. In 1902[11] Collie, Outram, Stutfield, Weed and Woolley, with Hans and Christian Kaufmann, made the first ascent of Mt. Freshfield. In 1906[12] Burr, Cabot, Peabody and Walcott, with Gottfried Feuz and Christian Kaufmann, ascended Mt. Mummery. In 1910[13] Eaton and Marocco, with Heinrich Burgener, traversed Mt. Dent and Mt. Freshfield with the intervening snow dome. They also made ascents of Mts. Pilkington, Walker and Bulyea. In 1917,[14] the Interprovincial survey occupied a number of stations in the group, ascending Mt. Bergne and Mt. Lambe. In 1920,[15] Eddy, Fynn and Mumm, with Aemmer and Inderbinen, made the third ascent of Mt. Freshfield.

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7 Interprovincial Boundary Commission, Sheet 18, 1917.

8 David Thompson's Narrative, p. Ixxxvi, Champlain Society. Toronto 1916.

9 Palliser, Folio, London, 1863, p. 150.

10 C. p. 52.

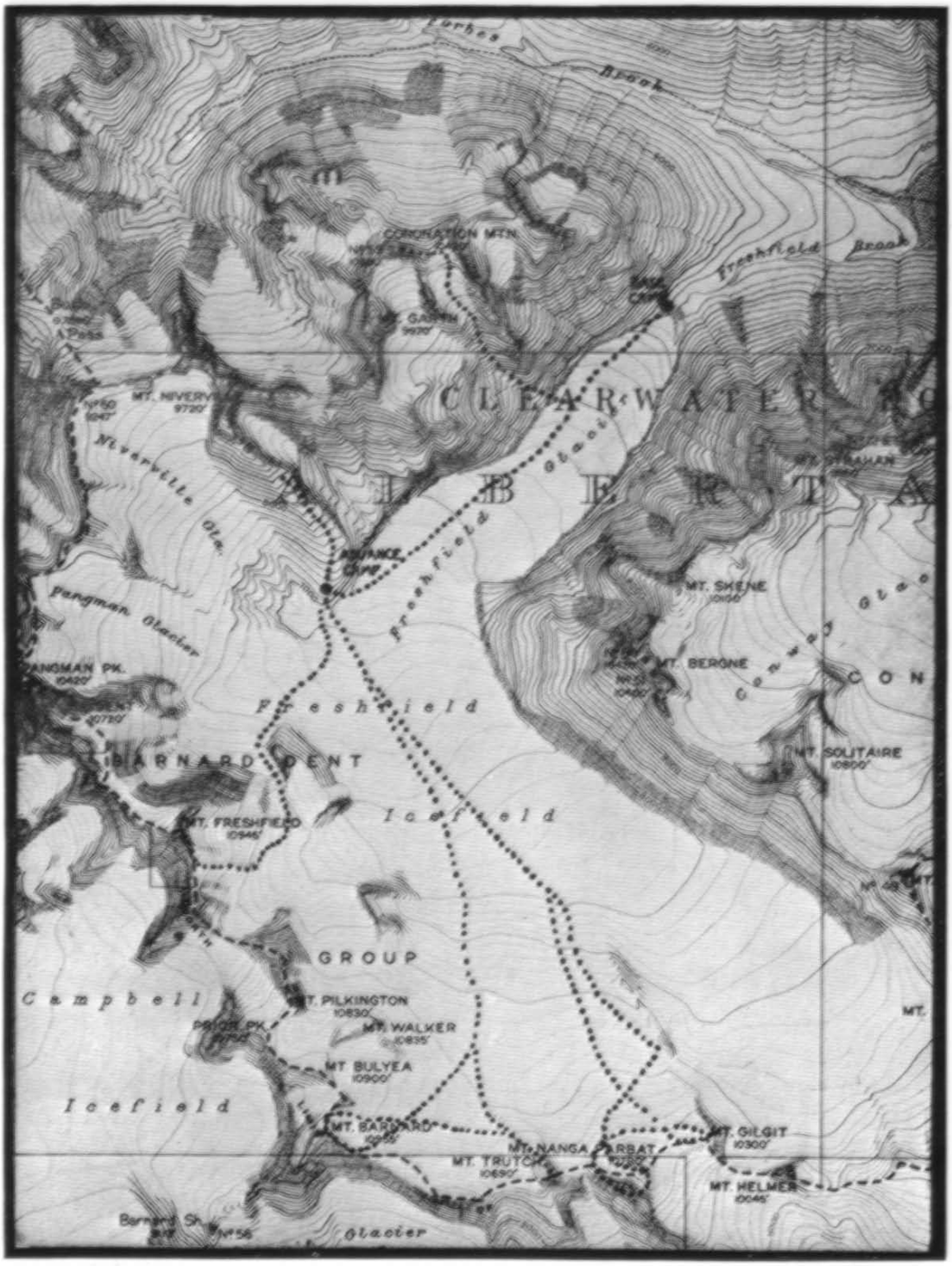
11 A.J. XXI, p. 367, C. p. 251, 266. O. p. 320

12 Appal. XI, p. 221.

13 C.A.J., p. 1.

14 Map sheet 18.

15 C.A.J., p. XIII, p. 179,



Showing Routes Travelled
From Alberta-British Columbia
Boundary Map, Sheet 18

In 1922, H. Palmer and the writer, Math Edward Feuz as guide, visited the group and made a number of ascents. Leaving Field on July 6th, with seventeen horses, under the care of J. Simpson, who had been with Collie in 1902, we journeyed northward by way of Amiskwi and Howse Passes. From Amiskwi Pass, we ascended the Ensign Stations of the survey,[16] and obtained fine views, but found it impossible to carry out a tentative plan of reaching Mt. Baker by way of Trapper Creek. From Howse Pass, we climbed through the bush and had a look at the Conway cirque, above the canyon which the stream enters, but saw no easy way of making climbs via this basin.

We established a camp at the Freshfield tongue on July 10th and on the following day, back-packed an Advance Camp three miles up the ice to a high meadow, 7,200 feet, on the southeastern slopes of Mt. Niverville. This is a splendid situation, with extensive views of the entire ice field; there is a good supply of wood and water. Camp was maintained here until July 18th. On July 12th, we ascended the Niverville ridge to 8,700 feet, but fog prevented any view. On July 13th, we put out a line of stones, one mile above the glacier tongue, in order to observe the ice motion.

On July 14th, we made the first ascent of Mt. Barnard, 10,955 feet, the highest peak of the group, traversing up the southeast ridge and coming down the north arête. (Ascent, 3:30-10:15.) This fine peak lies on the Divide, completely hidden by the Pilkington-Walker massif, and has only come to the attention of climbers as the result of the Boundary Survey of 1917. (Map sheet 18.) The icefield in its upper portion, is much crevassed, the snow on the mountain is very steep and was in a dangerously soft condition; the summit, at the northwest, rises to as fine a snow-spike as one is ever apt to see. On the west and southwest, there is a tremendous drop to the Campbell icefield and to Waitabit glacier.

On descending, we crossed the snow and made a first ascent of Mt. Trutch, 10,690 feet. This is a peculiar wedge-shaped mountain; a single northwest arête rises like a ridge-pole to the summit, followed by a sheer drop to the snow basin. We followed this arête, the last portion being a knife-edge of rock which had to be straddled and took some time to negotiate. (Summit reached at 2:00.)

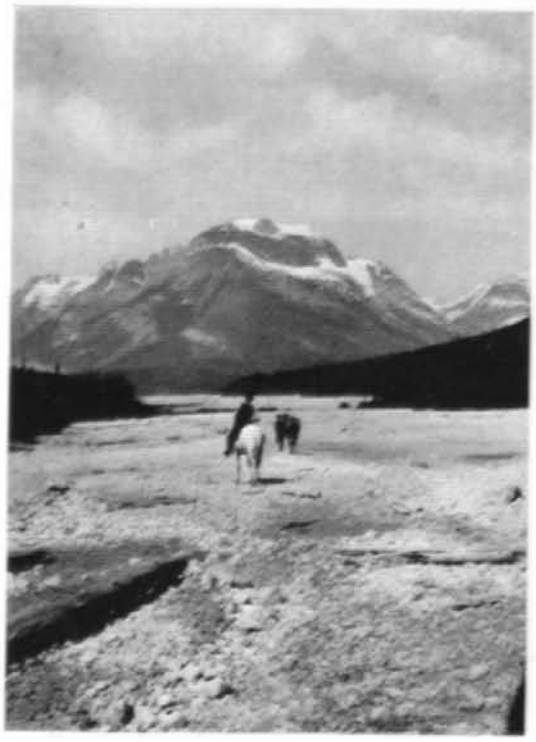
On July 16th, we made the first ascent of Mt. Nanga Parbat, 10,780 feet, by the northwest ridge, traversing and descending on the southeast arête and west snow slopes. (Ascent 3:45-9:35.) We then regained our line of ascent and, keeping high on the slopes, crossed and made the first ascent of Mt. Gilgit, 10,300 feet, by the west slopes. The outlook is magnificent and to the north we overlooked the icefield to the pyramid of Mt. Forbes, with Columbia and Lyell on one side and Brazeau with its snow-field on the other; we could pick out summits on the Continental Divide from Howse Pass to the Lake Louise district. East and west of Mt. Gilgit, high passable snow cols connect the Freshfield basin with the Blaeberry valley. Down the Waitabit gorge, we had fleeting glimpses of the Columbia valley and the Selkirks. (Summit at 12:15; camp regained at 4:45.)

On July 18th, the fourth ascent of Mt. Freshfield, 10,945 feet, was made. (4:00-9:00.) The route, up a broad snow gully, east of the Freshfield-Dent icefall, leads over to slopes opposite Mt. Pilkington; ascent is made obliquely to the south and the summit finally gained over the southern rock ridge.[17] Descent was made in record time, (To camp, 9:50-12:20.) and in the afternoon we packed our belongings down to the Freshfield tongue.

On July 20th, Edward Feuz and the writer made the first ascent of Coronation Mt., 10,420

16 Interprovincial Boundary Commission, Sheet 17.

17 A barometer taken to the summits of Mt. Barnard and Mt. Freshfield gave a reading of 148 ft. in favour of Mt. Barnard; the barometer was set on Howse Pass. On the summit of Mt. Freshfield, a level also indicated that Mt. Barnard is the higher.



Approaching Coronation Mt., 10,420 Ft. Photo, J.M. Thorington

Tongue Of Freshfield Glacier And Mt. Freshfield, 10,945 Ft. Photo J.M. Thorington

feet, via the Fresh-field glacier and the Garth-Coronation gully. (4:00-9:15.) The slopes are steep and loose rock requires a watch for falling stones. The final ascent of the peak, by the east arête, is made interesting by the sheer drop on the north side to Forbes brook. There is a survey cairn, 10,380 ft. on the west arête, perhaps 500 feet from the summit; this appears to have been reached from the direction of Bush Pass, and the bit of rock intervening between it and the summit was apparently not crossed.

The Freshfield icefield may be roughly divided into three parts; an icefall basin descending between Mounts Dent and Walker; an upper snow basin rising high on Mt. Walker and extending southward to Mt. Barnard and eastward to Mt. Gilgit, where it falls off in cornices and cliff; a lower headbasin descending from Mt. Barlow and adjacent peaks, joining with the other divisions in a series of icefalls and flat ice areas, eventually forming the Freshfield tongue. The Pangman and Niverville glaciers, descending into the basin from the peaks south of Bush Pass, are but loosely connected with the main field; the Niverville stream runs under the Freshfield ice, while a pressure tongue of the latter actually faces up the Niverville stream. Medial moraines are extensive and conspicuous, the large size of the blocks[18] being characteristic. Dirt bands are not prominent, but dirt zones are noticeable for quite a distance above the tongue. Our observations show that the tongue, one mile above the terminus, moves at the rate of four inches per day, a figure in agreement with the July motion of other glaciers in the main chain.[19] The tongue appears to be retreating rapidly, about four feet during the period of our stay. While the main tongue is quite flat, upper portions of the ice field are much broken by large crevasses;[20] at several places between Mt. Walker and Mt. Gilgit it is quite easy to lose one's way when attempting to reach the névé above.

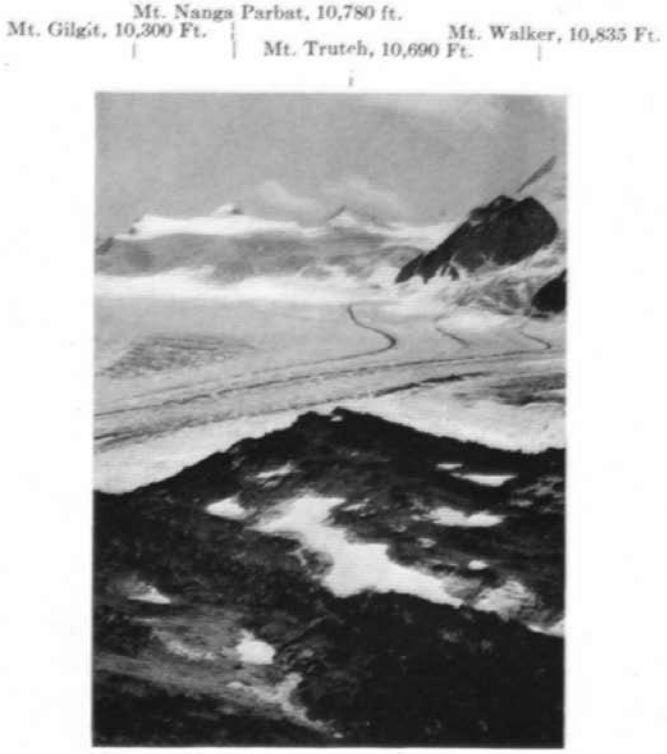
Our program was now completed; six 10,000 ft. peaks had been ascended, five of them first ascents. Rate of flow of the ice tongue had been measured and a photo-transit survey of the glacier concluded. On July 21st, camp was broken and we returned to Lake Louise by way of Howse and Mistaya rivers; Bow Pass and Bow river, arriving on July 25th. This route offers greater scenic attractions than the British Columbia approach and the trails are much better; on the western side of the Divide horse feed was at all times scarce; there is practically none between Field and Howse Pass.

There are about thirty named peaks in the Freshfield Group, of which at least twenty-four are over 10,000 ft.; of these, more than half remain unclimbed. Mt. Garth, Pangman Pk., Mt. Helmer, and Mt. Solitaire look as if they might offer some good climbing. Mt. Freshfield is the only summit in the group that has been climbed more than once. Nowhere in the Rockies can one reach such a tremendous icefield with greater ease; the possibility of establishing a high camp will ever be an advantage when the more distant peaks are to be gained. The scenic magnificence of the upper basin is beyond description; the journey thither is worth while if one does no more than see a sunset from our high meadow.

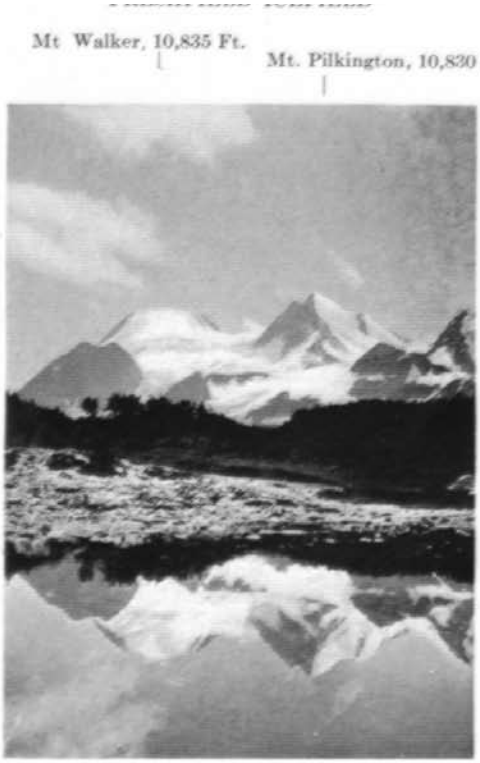
18 The largest boulder on the tongue, opposite the Garth-Coronation gully was ascended by Edward, who built a little cairn on it.

19 Viz., Scherzer, W. H. Glacial Studies in the Canadian Rockies and Selkirks, Bull. Smithsonian Inst., No. 1567. Washington, 1905.

20 Some of them were very large, a hundred feet wide, a hundred and fifty feet deep, and over five hundred feet long; they were sharply cut and snowed up flatly and solidly at the bottom.



Campground At Niverville Meadows, 7,200 Ft. Freshfield Icefield. Photo, J.M. Thorington



Peaks Of The Continental Divide. Photo, J.M. Thorington

The 1922 Attempt On Mount Robertson.

By A. S. Sibbald.

This is a tale not of success but of failure—if success in mountaineering be measured by completed ascents. There is, however, a healthy viewpoint held by a not inconsiderable number of members of the Alpine Club of Canada to the effect that the mountains may be enjoyed without actually standing on their summits. The difficulties of the last few hundred feet have given fame and wealth of tales and of associations to many a peak. So let it be with Mt. Robertson! We who tried to climb it on the day whose story is set out below recognize in it a doughty opponent to whom we are definitely in debt for a day's keen pleasure. We shall not begrudge our creditor the repulse which we sustained if thereby others are enticed to adventure on its summit ridge and enjoy what our conqueror has to offer.

The British Naval and Military Groups lie in the main range of the Canadian Rockies about twenty-five miles south as the crow flies from Canmore on the main line of the Canadian Pacific Railway. Four of their members, Mt. St. Douglas, Mt. Robertson, Mt. Maude and Mt. Beatty, are peaks of the Great Divide. The first named is the dominating peak of the groups, being 11,174 feet in altitude. Those members of the Alpine Club of Canada who visited the Club's North Kananaskis Pass Camp in 1922 and traversed the Haig Glacier will realize that these groups of great rock peaks enjoy a striking and spectacular setting both in relation to each other and because of the magnificent sea of ice and snow which flows about their bases.

The summits of Mts. Beatty and Jellicoe were reached in 1916 by members of the Interprovincial Boundary Survey Commission and occupied as camera stations. Mt. Sir Douglas was first climbed in 1919 by Dr. J. W. A. Hickson. Mt. French (10,610 ft.) the second in altitude, was climbed in 1921 by Mr. H. S. Hall, Jr., and Mr. Marcus Morton, Jr. Other than these ascents the peaks of the groups in question were unclimbed prior to the time of the 1922 Camps of the Alpine Club of Canada at Palliser and North Kananaskis Passes.

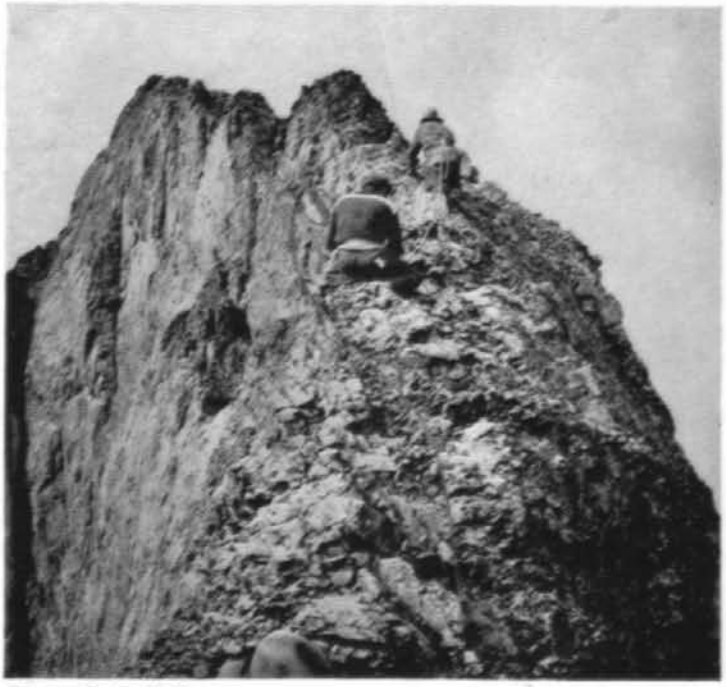
The highest unclimbed peak of the ten good summits in the two groups was then and still is Mt. Robertson. It is 10,400 feet in altitude and is wholly a rock peak surrounded on every side by glacier, except where connected by a low saddle to Mt. Sir Douglas on the west, and by a thin rock ridge of very irregular height to certain minor elevations lying further north.

Mt. Robertson lies between Mt. Sir Douglas and Mt. French and had been scanned from the latter by Mr. Hall in 1921. In his article in the 1921-22 issue of the Canadian Alpine Journal he tells how his party came down from Mt. French planning to climb Mt. Robertson and actually commenced to do so, but met with an unexpected difficulty and retired owing to the lateness of the day.

"Mt. Robertson appeared nothing more than a scree pile from here, so it was decided to do it on the way back in order to have a closer look at Sir Douglas from this side . . . Robertson is a crumbling mass and not attractive to climb upon. We worked up three or four hundred feet to the east ridge, followed it for one hundred yards, came upon a vertical barrier which would have necessitated considerable detour, looked at our watches noting the flight of time and decided to beat a retreat to camp."

Few mountaineers, even amongst those who enjoy the mountains without standing on their summits, are free from the desire some day in the course of their climbing to stand where never man has trod before. The strange desire which a phrase such as this last stirs up in the breast of the initiate was foreign to but few who tramped the long miles of trail to Palliser and North Kananaskis

Working Up Ridge Of Mt. Robertson



Summit Ridge Of Mt. Robertson, 10,400 Ft. Photos, D.J. McGeary

in 1922. There was, therefore, ready soil for a suggestion made by the Swiss guide Ernest Feuz one evening at the camp fire at the upper camp. During the day he had led a party up Mt. Beatty and with his glasses studied the district from that vantage point until its main, contours reserved few secrets from him. On the morrow, August 2nd, he with Dr. Fred Bell and Mr. M. D. Geddes were to cross the Haig Glacier and attempt an ascent on Mt. Sir Douglas from the east in the hope of meeting at the summit a party which was to climb from the Palliser side on the same day. Ernest suggested that a second party be organized to prospect a route of approach to Mt. Smith-Dorrien and to attempt an ascent if the route proved feasible. Mt. Robertson was also mentioned, but Ernest dissuaded us at that time from further consideration of that peak. He stated that he had examined Mt. Robertson from Mt. Beatty during the day and that the former's upper part had seemed very steep. He advised waiting until his own party had made a closer inspection from Mt. Sir Douglas, but advanced the claims of Mt. Smith-Dorrien, which was also unclimbed.

A party consisting of W. F. Gillespie, J. H. Hall, Jr., D. J. M. McGeary and myself, therefore, left camp at 4:30 next morning in company with Ernest's group and wishing with all our hearts that the day would yield us a new peak. The route lay first up a steep grassy slope and then over the moraine around the east end of the ridge of Mt. Maude and on to the Haig Glacier which was reached at 5:12. A little way beyond its margin we rested on a group of boulders which the glacier was carrying towards the moraine, and which later became a rendezvous for parties from the upper camp. At 5:47 we slipped on our packs and the two parties separated, Ernest leading over the ice in a line roughly parallel to the wall of Mt. Maude on his left, and ourselves tending to the right in the general direction of the highest part of Mt. Jellicoe so as to avoid the transverse crevasses. which seamed that part of the glacier in the angle between the routes of the two parties.

We were in a region which, to habitual dwellers on cultivated plains or in forested country, must have seemed harsh in the extreme. The rock peaks of the British Military Group rose in grim array around us straight from the glacier level without any mantling of vegetation whatever. It is a type of scenery which, however, makes an increasing appeal as one becomes, season by season, better able to read and estimate the elements of grandeur and of beauty in the peaks. Not all beauty is of a gentle cast. In mountain country it is to be found in the gleaming surface of the icefield and in the superb rise and fall of lofty skyline as well as in the wooded and watered surface of the valleys.

Let it be said at once that we did not reach Mt. Smith-Dorrien that day. We had an excellent view of it from the low part of the ridge connecting1 Mts. Jellicoe and French. But a sheer rock wall dropping from 800 to 1,000 feet on the far side of the Jellicoe-French ridge effectually barred the line of approach which we had set out to explore.

This disappointment came at 7:22 in the morning. The day was therefore, abundantly young enough to offer possibilities in lieu of the ones which we had been obliged to forego. All around us were rock peaks and glaciers adequate to cheer any Alpine heart. We decided to spend the day exploring rather than to return to camp. As a beginning we dropped down again from the ridge to the Haig Glacier and started across the snow-fields towards the base of Sir Douglas intending to watch Ernest's rock climb on its precipitous south buttress. As we travelled steadily westward there passed in succession behind us on our right first the walls and slopes of Mt. French, then the narrow snow-gap between Mts. French and Robertson and then the face of Mt. Robertson itself. We discussed at first in a tentative way and then with greater seriousness an attempt to climb the latter peak. But a lack of definiteness marked our plans throughout the forenoon. We lunched at the foot of the Robertson shale a little east of the Haig-Robertson col between 10:00 and 11:00 a.m.

Our own plans for the day did not interest us at the time as much as did the plucky effort which Ernest and his party were making where they clung precariously far above us to rockholds and ropes on the side of Mt. Sir Douglas. We cheered seem to rise any considerable further height. A sharp and very thin shoulder of whiter rock jutted up from it and seemed to present the only serious barrier. Our views agreed that if we could pass it the summit would be easily reached. Almost at once, however, as we advanced and long before the white ridge was reached, the ridge narrowed and took on new characteristics. Not only did its edge become exceedingly thin but, with very limited exception, the thinness continued as far as we could trace the ridge from our viewpoint. The fragility of the edge also continued and we had practically to sweep and test every foot of it as we advanced.

The straight drop to very great distances on the left was countered on the right by one varying 70° to 85°. Very soon all five of us sat down and straddled. We made steady but very slow progress. The white point was reached and proved to be an outjutting of firm rock which permitted an easy traverse on its right face with a very simple means of again reaching and straddling the ridge just above. We imagined success within our immediate reach. But a few more minutes of slow hitching forward showed us that the sloping rise on the crest of the ridge which had seemed to us for the past, forty minutes to be the summit was not the highest point and that the latter was some four hundred feet further on. The ridge continued as narrow as ever and, half-way between ourselves and the summit, became complicated by a series of inverted V's of rock on the crest line of the ridge without, however, any thickening of the latter. We edged forward with the uncomfortable feeling—probably unwarranted—that the thin, perpendicular slab on whose upper edge we were straddling was so insubstantial that at any moment a section of it, disturbed by our weight, might fall away. The very slow progress and unusual character of the climbing began to tell on us. As we approached the teeth on the far end of the" long, thin ridge we realized that the chief difficulty still lay before us.

They varied from nine feet to perhaps twelve feet in height and so were too high for a man to reach their tops by standing erect on the ridge. None could be traversed on the left. Some of the farther ones might offer a route around their right sides but this was supposition only as their right faces could not be seen. The nearer ones did not indicate much probability that the structures of the right faces would permit such a method. In my view Mount Robertson's summit ridge should not be tried by inexperienced climbers. The last two hundred serrated feet, following upon a real knife-edge of approximately three times that length, will prove a test of self composure and of technique for an experienced party.

About two hundred feet along the ridge from the summit we halted and drew together on a slightly flattened part and held a council of war. The further elevation to be overcome did not appear to be over fifty feet. But the difficult inverted V's stood on guard between us and our goal. It was eight minutes to four in the afternoon and we were a very considerable distance from camp with a long rock descent between us and the glacier. We had been on the move for nearly twelve hours and found that our first vigour of the morning was yielding to the passage of the hours and the strain of the somewhat unusual type of climbing. We were five on the rope and progress would, therefore, necessarily be slow. We agreed that an hour's time would be required for our party to overcome in turn each of the various V's which guarded the additional two hundred feet of ridge between us and the summit. The building of a cairn and the return, to our present location would bring us back to the latter at six o 'clock. The prospect of crossing the crevasses and the moraine at midnight did not appeal.

In retrospect the turning back from an unclimbed peak whose summit was in clear view only the width of three roadways away chiefly because of fear of a late homecom-ing appears at times to have been a mistake. Yet second thought usually confirms the belief that our somewhat tired party did wisely not to attempt that last formidable part of the ridge so late in the day. We leave it to the next party and wish them the two hours of time which we lacked and the strength and skill which we were not sure we possessed.

The ridge was too narrow to build a mound of any size at the farthest point we reached. A very small one was constructed and a record placed in it. But the support available was too meagre to give us any assurance that the little sixteen-inch pile of stones would have any permanence, or be distinguished from other debris when the next party approaches the peak.

The descent was slow and without noteworthy incident. The first face which had given difficulty in the ascent the one climbed just after Mr. Geddes joined the rope—was the only one which presented a problem on the way down. The rope was looped over the top of the ridge at that point to ease the last man's progress down the side of the rock.

The col was reached about 7:30 and we were on the glacier at 7:45. Night closed in very softly as we made our way homeward over the snow. We had seen the sunrise from much the same position at what seemed a very long time ago. No one of us would have forgone that which lay between. A multitude of other days occupied with what may have seemed more important things are already forgotten by each of us. But the occasion of our attempt on Mt. Robertson with its comradeship of endeavour in the open air and high places of the world needs but a word to start into instant life in our memories.

The Clemenceau Group.

By Allen Carpé

From the vicinity of Mt. Columbia, the watershed of the Canadian Rocky Mountains extends in a somewhat westerly direction, encircling the headwaters of the Chaba river and dropping down towards the north to the wooded depression of Fortress Pass, the lowest point of the Continental Divide between the International Boundary and the Yellowhead Pass. The eastern slopes of the range in this vicinity are accessible from the Chaba River; the principal uplift, however, occurs west of the Divide, and this large area, extending roughly from the valley of Fortress Lake and the Wood River to that of the Sullivan River, has remained unexplored and almost unknown. Quite recently a few of the summits have been triangulated and named by the Interprovincial Boundary Survey,[21] and from the highest of these, Mt. Clemenceau, the group may take its name.

The region contains about a dozen peaks in excess of 10,500 feet, all situated west of the Divide. Of these, Mt. Clemenceau is given by the Boundary Survey as 12,001 feet, the fourth highest summit in the Canadian Rocky Mountains, while Mt. Tsar, some 12 miles further south at the head of the Middle River, is 11,232 feet. None of the others appear to exceed 11,000 feet, although several approach that figure very closely. From Mt. Clemenceau to the source of the Sullivan River, just beyond Mt. Tsar, stretches the Clemenceau icefield, one of the largest ice sheets in the Rocky Mountain range. High ridges separate it from the Chaba icefield east of the Divide. In general the glaciation is more ample than is usual in the Rockies, the character of the

21 In addition to those mentioned in the next paragraph, exact altitudes are available for the following: Ghost Mt., 10,512 feet, Mt. Bras Groche, 10,871 feet, and a nameless ridge adjacent, 10,748 feet.

country in this respect resembling that of the Selkirks, and the base level of the valleys being low, the group can hardly be surpassed for scenic grandeur anywhere in the range.

Although one of the last areas remaining unvisited, this region was among the first discovered by the pioneers of Alpine travel in the Canadian mountains. Mt. Clemenceau was first reported by Prof. A. P. Coleman, who saw it in 1892 from "Misty Mt." at the head of Chisel Creek[22] but did not approach it because of steep cliffs. More distant views of the same mountain were obtained in 1896 by Mr. Wilcox from points about Fortress Lake and the valley of the Wood River, but there is no record of further travel in the Wood River country until 1920, when Mr. Campbell's party of the Interprovincial Boundary Survey penetrated the valley of Clemenceau Creek and occupied several camera stations at its head. This appears to have been the first party to set foot on the Clemenceau glacier. Later in the summer of 1920, Mr. Howard Palmer and the writer made a flying excursion from Fortress Lake down the Wood River and accomplished the ascent of Mt. Serenity, from where a group of high and extraordinarily beautiful mountains could be seen to the south across the Wood River, culminating in a splendidly perfect ice pyramid which we knew to be the mountain seen by Coleman and Wilcox. From it high, glaciated ranges stretched far to the west and south, and in the distance the sharp summit of Mt. Tsar was visible. The circumstances of our visit prevented any closer approach at that time, but two years later the writer yielded to the attractions of the region and, in company with Messrs. H. B. de Villiers-Schwab and H. S. Hall, Jr., undertook an expedition to it which is described in the following pages.

The party left Jasper on July 27th. Our outfit, consisting of thirteen horses, was in charge of W. D. Harris and H. Mellor, with a helper, Dean Swift. The first day's march brought us to the falls of the Athabaska, twenty miles from Jasper, at the foot of Mt. Kerkeslin. The falls themselves present a fine spectacle, and across the valley Mt. Cavell is prominent, with the Whirlpool River on its left leading towards the Athabaska Pass,

Above the Whirlpool, the mountains on the left bank of the Athabaska as far as Fortress Lake are divided into two roughly equal parts by the valley of Lick Creek,[23] a tributary to the Athabasca a little below the Sunwapta. The first block of territory is dominated by Mt. Fryatt, 11,026 feet, a jagged horn of rock rising spectacularly some miles back from the river, being just visible from Jasper. Excepting Mt. Cavell, this is the highest peak between Mt. Clemenceau and the Robson group, and it has the appearance of being very difficult of access. Beyond it, five attractive peaks enclose a valley with a small glacier; three of these rise in shapely towers close to Lick Creek, one reaching 10,300 feet. Above Lick Creek the mountains are less distinctive, the highest point, Mt. Catacombs, being a bulky mass 10,700 feet high, but capped by a flat summit glacier which detracts from its apparent altitude. Jutting out from it toward the main valley are Dragon Peak, 9,600 feet, and Fortress Mt., 9,908 feet, both terminating points of ridge-like structures, which are in places weathered to saw-tooth arêtes.

From the falls we proceeded up the east bank of the Athabaska and rounded a pretty lake to the warden's cabin above the canyon of the Sunwapta, where a bridge replaces the former ford of this river. The trail then descends over soggy ground and continues alternately along the banks

22 See The Canadian Rockies, p. 155 and sketches. Coleman's "Misty Mt." was located on the watershed between Chisel Creek and Clemenceau Creek, a high ridge extending south from Ghost Mt. to the main Divide, glaciated on the east but largely bare and rocky on the side toward Clemenceau Creek. The highest point shown in the sketch facing p. 153, presumably the point ascended, is about a mile from the Divide and five miles in air-line from Mt. Clemenceau.

23 Known locally as Goat Creek. The name is much in use and often repeated by local travellers. Within twenty miles is Goat River, flowing from the summit of Whirlpool Pass, westward to Canoe River.—Ed.

Mt. Clemenceau From The North. Photo, A. Carpe

Mt. Clemenceau (12,001 Ft.) From The East. Photo, A. Carpe

of the Athabaska or through a moderately recent burn, with much deadfall. While making our way through this, on the afternoon of the 29th, one of the horses became entangled in some obstruction and kicked out, dealing Schwab, who was riding close behind, an ugly blow on the right knee. We applied what remedies we could on the spot, and camped at the first opportunity, about a mile below the confluence of the Chaba and directly opposite Dragon Peak.

The next morning we were all greatly relieved when Schwab reported his knee somewhat better after the night's rest and felt able to proceed. We crossed the Athabaska and Chaba rivers by easy fords, enjoying delightful views of the upper Chaba valley and Mt. Quincy,[24] and rode through good timber along the base of Fortress Mt. to Fortress Pass, where we arrived shortly after noon. We pushed on immediately around the north shore of Fortress Lake, relying upon the trail cut out by the surveyors two years before; the lake is about six and a half miles long, with an average width of half a mile, and is 4,383 feet above sea-level. On crossing the Divide, the transition from the lighter growth of the eastern valleys to the dense, semi-tropical wilderness of the Pacific slope is very sudden, and within a few miles we were surrounded by devil's club, alders, wasps' nests and all the rank luxuriance familiar to the wayfarer in the lower valleys of the Selkirks. The trail was in bad shape from fallen trees and new growth, many steep ascents and descents were required, and progress with the horses was painfully slow. Nightfall at last found us scarcely half way around the lake, hemmed in between the water and steep, wooded slopes, with no feed for the horses nor any level ground for even the most modest camp. We halted in the trail and tied up the horses, rolling up in our sleeping bags under the trees. Directly opposite our bivouac rose the sheer wedge of Chisel Peak (10,005 feet), resembling greatly, but exceeding in height, the north face of Mt. Geikie from west of Tonquin Pass.[25]

The next day the going continued difficult, and a large thicket of alders required a good deal of chopping; at length we reached the flat at the west end of the lake and camped in a pleasant grove not far from the outlet.

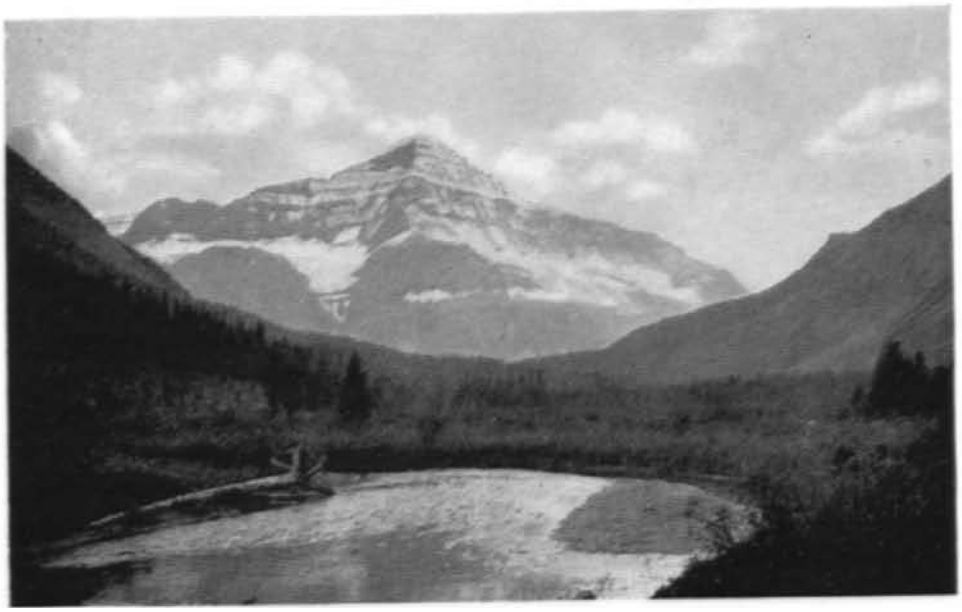
Somewhat more than four miles below Fortress Lake, the Wood River descends into a formidable canyon through which it flows for another four miles before spreading out over the broad gravel flats which, apparently, characterize its remaining course to the Columbia. The drop through the canyon is upwards of a thousand feet, most of which occurs in the first two miles. At the foot of this first drop Clemenceau Creek enters from the south, guarded on either side by Ghost Mt. and Mt. Bras Croche,[26] the latter standing close to the Wood River and rising so abruptly above the canyon as seemingly to close the valley to one approaching from the east, while Ghost Mt., on the other hand, is a retiring snowy summit of almost unearthly purity and whiteness, not fully seen except near the canyon. The Wood River at Clemenceau Creek is less than 3,500 feet above sea level, while Mt. Bras Croche reaches 10,871 feet less than a mile and a half back from the stream, a rise of 7,500 feet at the unusual average gradient of 45 degrees. North of the Wood River Mt.

24 A noble mountain, standing in the angle between the Athabaska and Chaba rivers, 10,400 feet high, with many turrets and towers, and a fine tumbling glacier, Mt. Dais, 10,612 feet, lies behind it, to the south.

25 The highest point of Mt. Geikie is 10,754 ft.

26 Named after John McDonald, of Garth, "a small maimed person of great courage and immensely effective energies," partner in the N.W.Co., 1799-1816, and a member of the overland party from Astoria to Rocky Mountain House in 1814, crossing the Athabaska pass about May 12 of that year. See Elliott Coues, "Early History of the Greater Northwest," p. 278., and Franchere's Narrative. It is interesting in this connection to recall that Fortress Lake, although rediscovered to the modern world in 1892 by Prof. Coleman, was known in the days of the fur trade. Thus DeSmet, writing from the head of the Whirlpool River in 1845, says (Oregon Missions, p. 202): "...on the other side of the (Scott) glacier, there is a large lake of considerable elevation."

Tusk Peak, 10,000 Ft.?



Mt. Bras Croche (10,871 Ft.) From Wood River Valley. Photos, A. Carpe

Serenity, the eastern outpost of the Hooker group, supports a large glacier from which Serenity Creek joins the Wood River just above the canyon, Ghost Creek flowing in from the south almost directly opposite. Above this point the valley is wide and quite level, containing on the right side of the stream a large amount of swampy bottom land, interspersed with good meadows and fans of gravel wash where tributaries enter.

We continued down this side of the valley to Serenity Creek, where we intended to cross the Wood River and start back-packing. On arriving here, however, we found the Wood River a powerful torrent, swift and deep, and with such steep banks that it seemed unwise to attempt the ford. After searching fruitlessly for a crossing or a suitable place for a bridge, we therefore retraced our steps and established a base camp on the gravel flats at Alnus Creek, a major tributary to the Wood River about a mile below Fortress Lake. Before leaving Serenity Creek, two of the party descended to the head of the canyon and climbed the slopes above the cut-bank, from where, rising more than 8,000 feet above the Wood River, the great white triangle of Mt. Clemenceau was magnificently framed in the deep trench of the valley.

A ford was soon found just above Alnus Creek, and we prepared for back-packing. Harris was to go with us as cook, and Swift part way as packer. Equipment and provisions for something more than two weeks amounted to nearly 60 Ibs. per man, which we elected to move in two relays. On the morning of August 3rd we ferried our loads across the river on a horse and started down the south bank with packs of 30 lbs. each. There is very little bottom land on this side of the river, the slopes being densely wooded and dropping away steeply to the bed of the stream, while outcropping cliffs, overgrown with devil's club and bushes, force frequent ascents and detours. After three and a half hours of heavy work, aided by a friendly game trail, we reached the broad gravel delta of a minor tributary to the Wood a fraction of a mile above Ghost Creek. We halted here, having advanced something more than a mile and a half, and in the afternoon retraced our way and fetched up the second load of supplies. Our camp was beautifully situated opposite Mt. Serenity, with Mt. Bras Croche closing the outlook toward the west. The altitude was 4,300 feet.

Ghost Creek and Clemenceau Creek are separated by a shoulder of Ghost Mt,, on which, at an elevation of 7,333 feet, is located the survey station Wood River South. The best means of access to our objective appeared to be to ascend this ridge and skirt along above timberline to the Clemenceau glacier, a total distance of some seven miles. Accordingly we left camp at ten the next morning, cross Ghost Creek by means of a small tree, and soon started up at a steep angle through the woods beyond, passing several cliff belts on the ascent. The survey cairn was reached at about 3 :00 p.m., the last thousand feet being above timber-line. Views had been unfolding as we rose, and now a magnificent panorama was disclosed, embracing Mt. Clemenceau and the whole course of Clemenceau Creek, Mt. Bras Croche, Ghost Mt. and the ample glaciers of Mt. Serenity and the Hooker group. Four thousand feet below us the Wood River flowed between frowning cliffs.

Caching our loads against the cairn, we started down, It now appeared that the strain of the ascent had been too much for Schwab's knee, until then well on the road to recovery, and on reaching camp the injured member was stiff and badly swollen. Further advance was impossible, nor was Schwab in a condition to reach the base camp on foot, and it therefore became necessary to get him across the Wood River, where horses were available and help could be summoned if needed. The next day Harris and Swift walked back to Alnus Creek and returned in the afternoon with Mellor on the opposite side of the river. An 18-inch tree was thrown across to an island, a smaller tree thence to a gravel bar, and the remaining channel was waded with the aid of a rope. The crossing was managed by Schwab with skill and courage under the circumstances, and a horse

was waiting on the other shore. It was agreed that Mellor and Swift should return with him to the Alnus Creek camp, where it was hoped that he might soon recover sufficiently to make the journey out to Jasper with one of the men, rafting the lake if necessary or obtaining the use of a canoe from the Hinman party which was expected at Fortress pass about the middle of August under Donald Phillips' guidance. We were glad to learn later that this had been done, and that our unfortunate friend had returned safely to Jasper, travelling part way with the Hinman party.

Hall, Harris and the writer now carried the remaining supplies up the shoulder of Ghost Mt. and continued for some distance along the slopes high above Clemenceau Creek, a barren and rocky terrain, intersected by steep gullies. Water was entirely lacking, the drainage apparently going underground at a high altitude, and not until 6:30 did we discover a stream, issuing at the very brink of a precipice just below tree-line and cascading over cliffs to the valley below. We established ourselves on a grassy shelf overlooking the cliff and commanding an imposing view of the Bras Croche group across the valley. This large massif, which connects to the west with extensive ranges not seen from this side, supports the main peak of Mt. Bras Croche and a nameless ridge-shaped mountain to the south, the highest point of which is 10,748 feet. A sizable glacier issues from a high cirque between the two and terminates in a broad and beautifully fractured frontal precipice above a sheer cliff more than five hundred feet high, over which the drainage stream tumbles in a graceful waterfall. Avalanches nourish a considerable ice mass below, and morainal detritus continues far down into the valley. The weather being smoky and hot, discharges were almost continuous, but on our way out there was less activity.

The next day we moved camp forward only a short distance, stopping near timber-line opposite a lateral valley separating Mt. Clemenceau from the Bras Croche group. On the 8th we spent a long day bringing forward the goods left in cache on the Ghost Mt. ridge, and on August 9th dropped down through the timber to the Clemenceau glacier, which we reached in about two hours. A stream coming down from the vicinity of '' Misty Mt." disappears in an ice cave about a mile from the forefoot, and just beyond this we made camp on a wooded promontory overlooking the ice and backed by a pretty waterfall. The altitude was about 5,500 feet. Here we found the remains of Mr. Campbell's camp of 1920, reached by arduous back-packing up the valley bottom. Across the moraine-covered snout of the glacier rose the great bulk of Mt. Clemenceau, with the Bras Croche group to the north blocking the view down the valley.

The trunk stream of the Clemenceau glacier, with a length of about four miles, is formed by the confluence of two main branches, the one reaching out toward the southeast to the great gathering basin of the Clemenceau icefield, the other extending west around the southern base of Mt. Clemenceau and, as we later discovered, connecting with névé fields far to the west. The two tributaries are of about equal length, the distance from watershed to forefoot along the direction of flow being in either case about eight miles, but the eastern arm is wider and carries the greater drainage. In the angle between the two ice streams stands an important range of mountains, the most striking of which is Tusk Peak, set somewhat apart from the others and towering in massive precipices to an elevation of approximately 10,950 feet not quite three miles south of Mt. Clemenceau.

Two miles further to the southeast, and joined to Tusk Peak by a high glacier col, is a delicately formed snow ridge of great beauty, bearing three summits of about equal height, one reaching 10,900 feet. This is flanked on the northeast by the glacier-capped mass of Mt. Duplicate (10,100—10,400 feet), which breaks off in abrupt rock walls toward the north. From the

1. Ghost Mt., 10,512 Ft.
2. Mt. Duplicate
3. Apex Peak.
Photos, H.S. Hall Jr.

nameless snowy ridge[27] a glacier descends, passing in a splendid icefall between Tusk Peak and Mt. Duplicate and joining with the other tributaries to the main glacier. There are two medial moraines, the one originating from Tusk Peak, the other from the cliffs of Mt. Duplicate; a minor surface moraine bows out from a glacial cirque on the southeast face of Mt. Clemenceau, but is soon merged into the broad, lateral debris-pile along the base of this mountain. The main moraines are unusually large.

Since our departure from Jasper the weather had been fair though smoky, but the afternoon of our arrival at the Clemenceau glacier brought a change, and unsettled conditions endured until our return. Rain fell copiously during the night of the 9th. On the 10th we returned through wet brush for a last load of supplies, rain coming on again in the afternoon. On the llth the two climbers left camp under lowering skies at 7:45 a.m. and followed the great ridge of the right medial moraine for a few miles, then dropped down to the clear ice of the eastern channel and eventually turned up the east fork of the glacier. This becoming somewhat crevassed, we took to the slopes along its right margin and walked for perhaps a mile over gently rising meadows carpeted with a profusion of mountain flowers, returning to the ice opposite Mt. Duplicate. Here, above the icefall, the glacier begins to open out toward the névé field, but on this occasion was lost in the ceiling of clouds which gathered lower as the day progressed. We plodded on for some time through the wet snow, rotten from recent rains, but at about 8,400 feet clouds enveloped us, and a driving snow storm forced a retreat at 12:15. In clearer intervals we obtained views of the southeast face of Mt. Clemenceau, of Tusk Peak, etc.

Mt. Clemenceau is a bulky mountain. From its base, which on the north is scarcely more than 5,000 feet, buttresses slope up steeply to an altitude of about 10,000 feet, and the summit ridges rise another 2,000 feet from this foundation. There appear to be three main arêtes, extending east, west and south. The north face is ice-clad and very precipitous, and being bounded by the rather steep and remarkably even east and west arêtes, forms a triangle or pyramid of unusual grandeur. The east arête is narrow and heavily glaciated, festooned with enormous cornices and cleft by great schrunds originating in the north face; from its base an icefall descends behind a lower buttress into the lateral valley between Mr. Clemenceau and the Bras Croche group. The southeast face is recessed and contains two icefalls, descending in cirques on either side of a buttress, the southerly one being the larger and making some contribution to the main glacier, while the other terminates on a shelf somewhat above the valley. The upper part of this face is rocky, with a cliff glacier at about 10,000 feet. The south arête is less steep than the others, and appears to be broader and to bear a solid ice-cap, in the manner of a summit glacier; it terminates in a great buttress opposite Tusk Peak. The country to the west was unknown, and our next excursion was a reconnaissance in that direction.

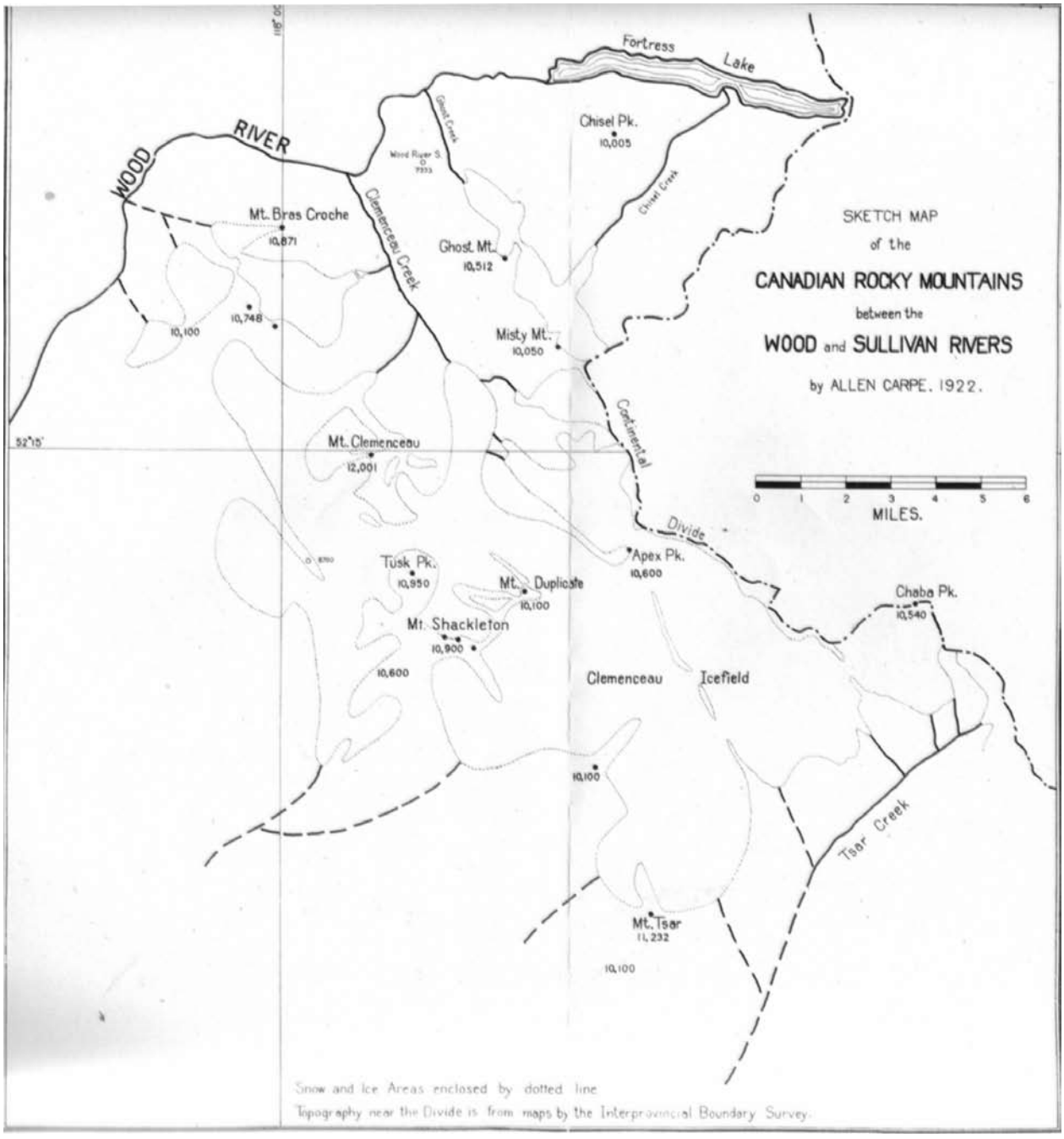
Following another day of rain, we set forth at 8:20 a.m. on August 13th to ascend the west branch of the glacier. The clouds were high in the morning, with a great clearness in the air. Crossing the two medial moraines, we followed close along the base of Mt. Clemenceau, the ice in the centre of the glacier being crevassed in a somewhat troublesome fashion, and after walking for some distance rounded the great south buttress of the mountain and climbed up on a ledge of rock beyond for lunch. The mists were already low above us. Returning to the ice, we struck across the névé to a low ridge bounding it on the west, the south end of which we ascended to an altitude of about 8,700 feet by 3:00 p.m., the higher points being in the clouds. This ridge extends north to the

27 Since named Mt. Shackleton by the Geographic Board of Canada at the suggestion of members of the party.—Ed.

Bras Croche group, and between it and the west base of Mt, Clemenceau the snowfield rises to a wide col, altitude about 8,300 feet, from which another glacier descends toward the north and east into the lateral valley previously referred to as separating Mt. Clemenceau from the Bras Croche group; this glacier also drains a large snow basin southwest of the latter massif and terminates along the north base of Mt. Clemenceau, being tributary to Clemenceau Creek. Between the southern extremity of our ridge and a western extension of Tusk Peak a second glacier pass gave access to a very considerable ice stream flowing south along the west base of the Tusk group, possibly draining into the Cummins river. The mountains southwest of Tusk Peak were obscured by clouds, but from other views are thought to contain a peak of over 10,600 feet. Immediately west of our station, a large flat snowfield drained to the south-flowing glacier, but further west the only glimpses were had through the drifting clouds, insufficient to resolve the apparently complicated drainages in this angle of the Wood River; we thought at the time to make out parts of the Selkirks along the Windy River, but it seems doubtful that anything was recognized with certainty. Close at hand, the west face of Mt. Clemenceau supported a large, steep mass of ice, much crevassed, which disappeared into the clouds above 10,000 feet. The lower part looked difficult but feasible under favourable conditions. There is also a steep ice slope just back of Tusk Peak, which may be the most promising line of attack on this mountain. We lingered for some time on our cheerless perch, hoping for better views, but at length returned down the glacier and reached camp in about three hours.

At the head of the eastern branch of the glacier, two and a half miles east-northeast of Mt. Duplicate and not far from the Divide, is a somewhat rounded summit, mostly snow-clad, contoured by the Boundary Survey at 10,600 feet. It is the highest point along the eastern confines of the snowfield, overtopping considerately the ridge system carrying the Continental Divide, and for this reason we called it "Apex Peak." It appeared that this mountain might be accessible even under the adverse conditions prevailing, and we made it our next objective. Leaving camp at 5:30 a.m. on the 15th, we followed our route of August llth to the base of the snowfield and continued up it to its crest east of Mt. Duplicate. On reaching the top of the slope, where a view to the south was possible, the whole peak of Mt. Tsar was suddenly disclosed, seven miles distant, standing forth for a moment with incredible clearness before disappearing again in the clouds. We continued for some distance to the south to avoid a heavily crevassed section of the icefield, then swung east and north towards the mountain and gained the summit at 12:40 over steep scree and rock, with a generous sprinkling of new snow. Prom the ridge, glimpses were had of Mt. Alberta, The Twins and Mt. Columbia, sixteen miles distant, but the summit itself was level with the clouds and little could be seen. We were so to speak, on the backbone of the névé, a crest extending southward in continuation of the Ghost Mt.—Misty Mt. ridge and cropping out here and there throughout the length of the icefield. The Divide leaves this crest about half a mile north of Apex Peak and follows a ridge some two miles to the east along the Chaba icefield. Between the two is a section of the Clemenceau icefield, extending seven miles southeast from Apex Peak. To the west, the icefield averaged three miles or more in width, being bounded by the Tusk-Duplicate group opposite our station, Mt. Tsar eight miles to the south of us and a third group of lesser importance between the two, the central point of which may be estimated at something over 10,100 feet. Long ridges radiate south from the nameless mountain[28] southeast of Tusk Peak, and between these and the central group the snowfield drains west, probably joining the glacier seen on August 13th and flowing to

28 Mt. Shackleton



Sketch Map Of The Canadian Rocky Mountains Between The Wood And Sullivan Rivers. By Alan Carpe, 1922

the Cummins River. Between the central group and Mt. Tsar another valley cuts in deeply from the west, possibly draining to the Middle River. To the south, all the drainage is to Tsar Creek, a source of the Sullivan River, which heads against a low glacier pass of the Divide (7,300 feet) west of Mt. King Edward, opposite the Athabaska. This is a large and very deep valley, probably less than 3,500 feet at the base of Mt. Tsar. To the north, we overlooked the Chaba icefield, and through openings in the clouds could follow the course of the Chaba and to some extent of the Athabaska as far as the Sunwapta. While on the summit, snow began to fall, and we were in clouds during the descent to about 8,000 feet. It took a few moments to find our tracks on leaving the rocks, but on the snow they were easily followed and we plunged along at a good pace through the white void, regaining camp at 6:30 after covering a total distance of about fifteen miles.

The next day being again unsettled, it became evident that the major peaks would not be in condition during the few days remaining to us, and at 8:00 a.m. on August 17th we broke camp and started back to the survey cairn. This proved to be the clearest day of our whole trip, and we enjoyed wonderful views from the high level route. The cairn was reached at 4:45 p.m. (slow going;). The air was clear, and the mountains round about were bathed in a mellow afternoon light, tinged with gold. We spent at least an hour on top—one of those glorious hours which are the choicest reward of the mountaineer. To the west, above the gleaming silver thread of the Wood River, Mt. Brown could be seen. A long ridge, on some point of which David Douglas must have stood in 1827, stretched southward to a large flat snowfield at the head of Jeffrey Creek. Beyond, perhaps twenty miles distant, rose three of the peaks along the Canoe River which are prominent in views as far north as the Fraser group;[29] these do not appear to substantially exceed 10,000 feet, but are good peaks and must be very imposing from the Canoe River side. Between the two highest, in the far distance, a summit of the Gold Range rose to a much greater height.

We dropped down a few hundred feet to a grassy shoulder at timberline and passed the night under the stars, in full view of Ghost Mt., Mt. Serenity and Mt. Bras Croche. The next day we descended to Ghost Creek and found our bridges intact across the Wood River. On the other bank we were met by Mellor, who by a fortunate chance had just ridden down to inspect the crossing. We loaded our packs on his horse and walked back to Alnus Creek, whence the return to Jasper was made in four straight marches.

The First Ascent Of Mt. King Albert.

By H. E. Sampson

At the annual Club Camp held in 1922 at Palliser Pass, the majority of graduates qualified either on Mount Back or Mount Tipperary which afforded fair examples of graduating climbs. In the course of these climbs many looks were directed at Mount King Albert lying immediately west of Mount Queen Elizabeth, both named after the reigning Belgian Sovereigns, and various opinions were expressed as to the climbing of Mt. King Albert which, although only 9,800 feet in altitude and quite accessible, had never been climbed, a fact thought by some to indicate that the ascent might be difficult. However, the climbing committee, to test the matter, on August 4th sent out two parties under the leadership of T. B. Moffat to ascend the mountain, and in such a

29 There appear to be four of these peaks along the southern course of the Canoe river. In the Geographical Journal, vol. 57, p. 26, H. Palmer places the most southerly one at 10,300 feet. It is doubtful whether those mentioned above reach as high.

Mt. King Albert From The North.
Photo, Topographical Survey, Interprovincial Boundary

way as to have sufficient difficulties, if they existed, to make it a graduating climb. The other members of the party were Miss Park, Miss Hickson, A. B. Hildreth, and J. H. Hall, Jr. on one rope, with H. Pollard, J. D. Merriman, W. J. Taylor, G. A. Gambs and H. E. Sampson on the other rope. The parties started at a leisurely pace at about 8:00 a.m. and, striking west from the camp started to climb a little south of the waterfall leading from Albert Glacier and then proceeded by the moraine to the north shoulder of Mt. Queen Elizabeth where the glacier was taken, the parties there roping.

For a distance it seemed as if the climb could be made from the col between Mts. Queen Elizabeth and King Albert, and the party advanced to the bergschrund, which was found to be wide, deep and impassable in spots. A couple of abortive attempts were made to get to the rock, and the party had to move further westward where a start was made. The strata of the rock at this point were quite perpendicular and the party had some difficulty and considerable delay, as a result of which, after conference, the second rope proceeded north to the col between Mt. King Albert and the ridge which eventually rises to Mt, Leman. From here it looked as if the ascent could be made without difficulty, except perhaps at one place near the summit, where there was a break in the rock caused by a change in the strata.

The second party took to the rock a little before noon arid soon were caught in a rain storm which lasted the better part of the afternoon. They lunched in the shelter of the rock and then proceeded upwards and diagonally to the left, making towards the break in the skyline, the arête being found slow and more difficult on account of the many large rocks which necessitated climbing down and around. No serious difficulty was experienced until about four o'clock, when they reached the break in the rock about 500 feet below the summit, and there they were met by a perpendicular wall about 100 feet high and 80 feet wide, with a chimney too small for a person to enter at the bottom, but accessible by boosting; however, owing to the rain, the rock here was in bad shape for climbing. They tried to find a way to the east but an ascent from that direction was impossible, while to the west it seemed more possible but yet quite difficult. The party conferred and, in view of the still threatening weather, the condition of the rock and the lateness of the hour, deemed it advisable to desist for the day, and retired, getting off the mountain a little after six.

In the meanwhile Moffat's party had been gradually climbing towards the top, hoping to reach the arête and then proceed northwest to the summit. However, the climbing was found to be decidedly difficult owing to the lie of the rock and the rain, and the party had to retire before reaching the arête. Moffat himself unroped and climbed to about 100 feet from the arête, from which point it appeared that the summit could be reached if time and weather permitted but, as it was late and the rock was in bad shape for climbing, it was deemed necessary to start the descent at once.

The party descended slightly to the east of the route taken by it in its ascent. The upper part proved easy but the descent became quite difficult and dangerous further down, and it was found necessary that they should descend one by one, unroping as they did so, a member having an unnerving fall but with no bad results. This party was still several hundred feet up when the second, which had been out of sight for some seven hours, now appeared on its return. Calls were exchanged and the second party drew over to where Moffat's had taken to the rock, and it was then suggested that it should remain for a while to assist if necessary in getting them off. However, they were making such slow work in descending that Gambs and Taylor dropped down to the Camp to have assistance and food brought up.

In the meantime Moffat's party which had slowly continued the descent was obliged to

Mt. King Albert From S.W. Photo, H.E. Sampson

Party Who Climbed Mt. King Albert. Photo, H.E. Sampson

desist when night fell, as it was too dangerous to proceed and with night came a very heavy mist which soon became rain and lasted until about four o'clock in the morning. About ten o'clock Ernest Feuz with Newcomb appeared with lanterns and refreshments and set to work to relieve the benighted company, which was done by relaying the members one at a time. The work was very tedious and, under the circumstances, very trying, all being exposed to the wind and rain and, becoming soaked, got badly chilled. All night long there was a bombardment from above of rocks loosened by the action of the rain upon the snow and ice. Fortunately those on the mountain were out of the line of fire and no injuries were received by any one, although those at the base of the mountain were somewhat nervous at times at the nearness of some of the volleys. Six lengthy relays were required and it was not until about 4:00 a.m. that the first pair reached the glacier. As day would soon be at hand, Ernest deemed it advisable not to do anything more until daylight. The members of the second party, which had stood by during the night, then left, reaching camp about 5:00 a.m., and in a short time the balance which had been met by a relief party with refreshment also arrived. The whole party was warmly received at Camp and, after hot drinks and soup, soon slept off the bad effects of the night out which had caused considerable anxiety to be felt in Camp.

As a result of the difficulties so experienced in the first climb, the idea of there being a "jinx" about Mt. King Albert became more pronounced. To remove this, on the Monday following, August 7th, a party consisting of Ernest Feuz, G. A. Gambs, D. R. Sharpe, T. B. Moffat, K. G. McClelland and H. B. Sampson started at 8:15 a.m. to make the climb. Ernest had, in the meantime, examined the mountain at a distance through his glass, and expressed the opinion that, from the appearance of the rocks, there might be some difficulty near the summit. This party in two ropes took the same route as the second party on the previous occasion, attacking the mountain from the col to the north. About 11:00 o'clock it reached the break in the rock about 500 feet below the summit. After some boosting Ernest was able to get into the chimney and climbed about fifty feet where he found the rock accessible but extremely dangerous on account of loose rock, and did not deem it advisable to proceed in that way. He descended by the rope and the party then moved around to the west. Here, after a little delay, was discovered a place where it might proceed, but only with much difficulty, owing to the smooth, slab-like rock with very meagre footholds and handholds. Ernest, however, managed to get a secure footing some forty feet up and the rest of the party, by fully extending themselves and with the comfortable security of the rope, followed. This was the only really difficult point in the climb, and from there to the summit was comparatively easy. At 12:45 the party reached the top and, after mutual congratulation, lunched.

Fortunately the day was very fine, with the visibility very good. Many looks were directed towards the Assiniboine group to the northwest, and special attention was directed to Mt. Eon which had not been seen by the majority of the party since Dr. Stone's accident, but more attention was given to the British Royal group to the south with Mts. Queen Mary (10,600 feet) in the foreground and King George (11,226 feet) in the background. Envy was expressed of those who would have the privilege of climbing in. the Royal Group.

After lunch the party built a 6 foot cairn, left a record and started to descend about 1:50 with the weather still very fine.

Mount King Albert from above resembles a gigantic starfish which has been through a severe storm and lies battered into irregular form with various bruises prominent along its arms. One of these arms stretches to the north, one to the northwest and one to the southwest into the valley where the Albert River runs, the fourth towards Mt. Back and the fifth towards Mt. Queen

Elizabeth. A traverse was decided upon, but as the crest was so torn by precipitous walls of rock, it was necessary to climb down to the right of the spur leading to Mt. Back with the idea of climbing over such spur when a favourable opportunity was afforded and then dropping down towards Palliser Pass. Various possible chimneys were examined in the descent which was made without difficulty, and finally, Ernest after careful examination tried one which was some few hundred feet in length. He started up with the first rope and in due time his welcome shout indicated that he had found a successful route. The whole party was soon up and on the way down, and reached the foot of a small glacier where it rested.

From this side it appeared that the easiest ascent of the mountain could be made to the east of the col between Mt. Back and Mt. King Albert, The party returned by the south shoulder of Mt. Queen Elizabeth, dropping down to the Camp, which was reached about six o'clock after a very fine day, full of interest and sufficient exertion to make the party ready for a good night's rest. Throughout the day splendid views were obtained and during the return Mt. Sir Douglas loomed up in fine form to the east.

First Ascent Of Mt. Queen Mary.

By F. N. Waterman

The announcement that the 1922 Camp of the Alpine Club would be held at Palliser Pass, at once suggested the unclimbed peaks of the Royal Group and aroused the longing for exploration and the seeking of untrodden paths. Accordingly, with Mr. Wheeler's assistance, it was arranged that Mr. C. F. Hogeboom and the writer should precede the Club by ten days and try conclusions with some of the new peaks. Thus it happened that on July 18th we left Banff and, with the glamour of unsealed heights calling us on, trudged along behind our pack train as it started up the Spray Valley for regions new to us. The other members of our party were our competent packer, Reno Fitten, of the Alpine Pack Train staff, and Rudolph Aemmer who, of all the Swiss guides, best knew the region and who as it chanced, was also to be one of the guides so generously furnished to the Alpine Club Camp by the C.P.R. We were a companionable party, generously supplied with food, Reno's cooking was of the best, the weather was fine, and there was the mystery and enchantment of new peaks ahead. What more could we ask by way of a propitious start? One thing indeed was lacking—the clear air needed for photographs of our hoped for conquests, and, glorious as was the weather and weird and mystic as were the mountains as they rose above us to be almost lost in the smoky distance, we would gladly have walked in the rain had it promised a change in that regard. We feared, and the event proved, that much of the large supply of film which we had brought would go back unused.

Of our camp in Spray Valley and our successful ascent of Mt. Birdwood, Mr. Hogeboom tells in this issue of the Journal.

The afternoon of the 24th found us again on our way and we camped that night at the southerly end of Belgium Lake and looked back across it to the site of the Club Camp where some tents were already pitched and active work was in progress. It is unfortunate to have to record that, little frequented as this region has been, we found our chosen camping ground in a most unsightly condition. It seemed that those who had camped before had no thought that anyone else would ever come after them. Rubbish in the form of empty cans and discarded camp equipment was scattered about, and brush beds were still where they had been made. It is strange that those who enjoy the unsullied wildness of the out of the way places should be so willing to leave them marred by the

evidences of their thoughtlessness.

How to get within climbing distance of the Royal. Group had been the subject of much study and discussion. The Boundary Survey maps locate the peaks but do not indicate their character or their surroundings. Rudolph's study of the region and careful examination of the few available photographs led us to the conclusion that the only reasonably sure way of accomplishing a climb of one of these peaks in the five days which remained to us was to approach from the northerly end rather than to make the difficult and hence slow trip down the Palliser River and then attempt to get up the Royal Valley, lying along the easterly side of this Group. He had been over Mt. Back and had viewed the range from one of the lesser peaks beyond, and believed the trip practical. Accordingly, we camped in the Palliser Pass as the nearest point to which it was possible to take horses, the intent being to spend the next day in a trip over the passes of the intervening ridges to study the approaches as well as to confirm the impression which Rudolph had formed that Mt. Queen Mary, the most northerly peak of the group was at once the most attractive and the most accessible of the remaining virgin peaks. The highest, Mt. King George, much further to the south, had been climbed by Mr. Fynn and Rudolph in 1919.

The next morning, however, proved stormy. The clouds hung low. shutting out the mountains completely, and it rained heavily in showers. We busied ourselves about Camp and explored the pass somewhat, in the less stormy intervals. One of our precious five days was gone.

That night, just as we were beginning to dream of path finding on the following day, we were aroused by a distant humming, very human in quality, proceeding from the direction of the tent occupied by Rudolph and Reno. It was repeated many times, at about thirty-second intervals, until the writer found himself humming in unison and wondering if Reno, the musician of the party, was practicing in his sleep. The notes comprised a minor seventh and were rendered quite accurately in a seemingly inquiring mood. They are closely represented by the following:

Presently there was a silence of a minute or two and then another phrase was sounded and repeated at shorter intervals. This one abandoned the minor interval and was sounded in a tone of supreme contentment. Presently the sound became louder and seemed to be moving towards us as though the singer, having finished his serenade at, the other tent, was coming to honour us.

When, however it came to rest at the saddle cache near the corner of our tent, the suspicion was aroused that the owner of the voice was not actuated by solely romantic impulses, and our flashlight revealed a rather diminutive porcupine industriously trying to work off the weighted cover, which Reno had thoughtfully placed over the saddles. Stockinged feet and a balky light, which went out just at the critical moment, combined to spare the tuneful singer for the entertainment of future campers, but he received punishment enough to cause him to remain at a respectful distance from our camp hereafter. The plentiful sprinkling of quills which marked his retreat indicated that

Mt. Queen Mary (10,600 Ft.) From The North.
Photo, Topographical Surver, Interprovincial Boundary

pursuit would have been hazardous under the circumstances.

In mountaineering "man proposes but weather disposes," and the second morning found the clouds still hanging low and the rain falling with no prospect of clearing sufficiently to give the visibility necessary for our reconnoitering trip. We were a rather discouraged party as the day wore away, and with it passed all possibility of any preliminary study of our mountain. Toward evening the prospects improved and our spirits correspondingly rose as we turned in early, resolved to make the three remaining days suffice for all we had intended to do in five.

Undisturbed rest did not seem to be normal to Palliser Pass for, just as we were beginning to doze, we were aroused by a crash and a shout from the guides' tent. Hastily turning out we found that the poles supporting one end of the tent had fallen and that one of them had hit Rudolph in the head, producing an ugly looking cut, extending through his right eyebrow, which bled so freely as to give the appearance of serious damage. Our chances of getting any further climbing would have looked slim at that moment, had we had time to think of them, but after such surgical attention as our resources and knowledge permitted, it was seen that the cut was essentially superficial and eye uninjured. It was a narrow escape from a most serious injury.

What brought the tent down we never found out. There was no wind and yet a heavy stake driven deeply into the ground had been pulled out. No tracks were found, but Reno, who had been sleeping with his head against the tent wall, declared that immediately preceding the crash something had stepped on his face and he had resented it, and a few black hairs found on the rope which had been fastened to the stake suggested that a careless bear had run against the tent and, in his haste to get away from, the unexpected commotion caused by Reno's resentment, had collided with the guy rope.

The storm wore itself out during the night and the morning dawned gloriously. Rudolph declared himself feeling fit, and we made haste to get our packs ready, midst much last moment discussion as to what should be carried in view of the fact that it had been decided that Reno should go with us. Just as we were starting, Mr. Wheeler passed our camp on his way to North Kananaskis Pass and cheerfully promised us more rain before the day was over.

Rudolph led the way over the high pass southeast of Mt. Back and down onto the long glacier which lies between the Mt. Back massif and Mt. Tipperary, and its unnamed companion peak. The upper end of this glacier extends substantially to the ridge which terminates the Royal Valley on the north. The view from this point is magnificent and we resented the presence of the pall of smoke, which even two days of rain had not been able to dispel, and which prevented us from getting adequate photographs.

The descent into the valley looked steep and uninviting, particularly in view of our heavy packs, and we were relieved when Rudolph found a long, gently sloping shelf on the side of the mountain forming the easterly wall which afforded us easy access and permitted us to descend to the valley floor without difficulty, at exactly the right point. The trip had proved a slow and strenuous one and the afternoon was well advanced when we sat down in the valley to rest while we admired its beauty and considered our next move.

It was evident that our mountain was excessively difficult if not altogether impossible on its easterly and northern faces, and that another considerable valley must separate us from the ridge which seemed to extend from its northwesterly arête. It was therefore decided at once to climb the intervening ridge and at least take a look before selecting a camp site. Haste was in order for the approaching fulfillment of Mr. Wheeler's prophecy was evident as heavy storm clouds gathered in the southwest and advanced rapidly.

A magnificent view greeted us from the top of this ridge. The splendid Royal Group stretched away to the left, particularly grand as the storm clouds rolled over it and the lightning viciously and almost continuously bombarded the towering peak of Mt. King George. In front was a wide and exquisitely wooded valley, apparently never visited by fire, down which flowed a small stream originating on a cascade falling from the snow and scree decorated peak of Queen Mary.

Following one of the numerous elk trails we made oar way down to timber line as rapidly as possible and, selecting the first available camp site, hastily gathered wood, erected a lean-to shelter, and managed barely to get a fire started when the rain began to come in torrents, and the wind blew as if determined to lift the tent and the intruders who had erected it back to the place from whence they came. After the first fury the storm subsided sufficiently so that we could fry a little bacon and make tea, and after a short smoke we stretched out, feet to the fire and as near as heat and rain would permit. It was not exactly a comfortable night as the temperature fell almost to freezing and the wind refused to be kept out of our rather open shelter. We had no blankets but each had a sweater or heavy coat and between turns at tending fire each managed to get a little sleep. How little it was, was indicated by the fact that each of us declared, at breakfast time, that he personally had spent the night tending fire while the others made believe they were sleeping.

Toward morning the storm seemed to pass and we were up in good season to get dried out and prepare for the day's adventure. The uncertainty of the weather delayed our start, however, so that it was 6:30 before we started to cross the valley to ascend the westerly ridge from which we hoped to find a possible way up the mountain. Again we made our way by the elk paths and reached the top at 7:50, decidedly a late start for an unprospected climb on an entirely unknown side of the mountain.

We should have felt repaid for our effort had we gone no further, for the valley which we looked down upon was, we agreed, one of the most beautiful we had ever seen. It was a natural park, seemingly completely surrounded by mountains and containing one lake, perhaps an eighth of a mile, long, and several smaller lakelets at different levels. Fine groves of larch were picturesquely grouped and beautiful meadows filled the open spaces. On them we counted fourteen elk. One big fellow who had apparently been descending the mountain side just below us was greatly alarmed at the strange apparitions that had appeared on the skyline and bounded down the rocky slopes with the agility of a mountain goat, along the shore of the lake and across the meadows and did not stop running until he was safely lost in a grove on the far side of the valley.

The ridge we had ascended was in effect a northerly extension of the northwest arête of the mountain and led easily to the arête itself. As a means of access to the top, the latter did not look attractive from this vantage point. There were several places that looked as thought they might prove impossible, and, also, such study of the top ridge of the mountain as we had been able to make from our bivouac had made the traverse seem slow and difficult, if not impossible. Rudolph therefore decided to take a look at the westerly face, and for this purpose we ascended a short distance up the arête and traversed onto a westerly extending buttress from which the general structure of the mountain was revealed to us.

For sheer desolateness, the view which opened to us from this buttress would be hard to surpass. No trace of vegetation was to be seen but only wastes of rock slide at impossible angles, and immense buttresses in advanced stages of decay. Instability seemed the fundamental law of the place. The mountain, which, from the other side had seemed a huge massif of everlasting rock, was seen to be a comparatively thin slab turned up vertically and braced from behind by four or five huge, disintegrating buttresses reaching far down into the deep valley back of the range. Between

were steep couloirs terminating above in deep cracks extending more or less vertically, to the top ridge. All were natural rock chutes.

We crossed the first couloir working gradually upward, and at 10:00 o ‘clock got onto a shoulder of the second buttress, where we put on the rope. From this we looked across a system of couloirs or gullies between it and the third buttress. One of the cracks leading to the main ridge looked possible and we worked our way over to the couloir leading to it with less loss of altitude than had seemed possible. Luck seemed to be with ms for the moment, especially as there seemed to be very little rock falling, in spite of the very threatening appearances. The crack selected was found to contain much ice, so we turned into an adjacent chimney somewhat further to the north, and more distant from the peak, which, apparently, also went to the ridge. The rock here was better and we made good progress, with interesting climbing until near the top when Rudolph was astonished suddenly to find himself looking through a window out across the Royal Valley and with a sheer vertical drop below. On either side the rock walls extended considerably higher, but the wall toward the peak was vertical or slightly overhanging and quite smooth. The first impression wais that we were trapped and that the only course open to us was to descend and try the other crack, a proceeding which we felt would also defeat us because of the time it would consume. We could see little from where we were so Rudolph climbed up a crack in the opposite wall to study the situation.

Immediately above the sill of the window, the rock forming the south wall of our chimney overhung on the Royal Valley side, and in this overhanging part was a vertical crack some four or five inches wide, Indicating that sometime the overhanging part would fall into the valley. Rudolph announced that the wall was only some thirty feet and that the crack ran clear to its top. He thought that if he could once get started he could make the climb. It was a perilous looking undertaking. The wall was actually vertical and the manoeuvre necessitated stepping upon insecure footing and then stepping out over empty space into a crack that was barely wide enough to permit of entrance of the toe of his boot. The window sill accommodated two with difficulty, so as Rudolph stepped up, one of us stepped up back of him and assisted while he transferred himself over to the crack, anchoring meanwhile as well as possible. It was a very tense period for us during which he slowly worked his way to the top, and a decided relief when he disappeared over it and called to us to follow. Notwithstanding the assurance given by the rope, the transfer into the crack had a real thrill in it. The writer is entirely free to admit that had he been called upon to lead at that point Mt. Queen Mary would probably have remained unclimbed.

Rudolph said nothing as we crawled over onto the top, but there was no expression of triumph on his face. The reason was at once apparent, for we were on a flat topped gendarme to which the only possible mode of access was the route by which we had come. At the south was an overhanging face leading down to an exactly similar window with a knife edge for a window sill. Next was a lower rectangular block of rock, and beyond that an immensely higher vertical cliff guarding the approach to the main peak. It now seemed still more certain that we were defeated. However, Rudolph does not give up easily and we turned our glasses toward the cliff to make a minute inspection of its every detail. This showed that there was a narrow ledge extending around it, some distance up, which ran out at the corner but reappeared on the west face and seemed to extend along the wall clear to the next buttress, but on the face toward us it was very narrow, and about three feet above it a curious slab of white rock jutted out and extended nearly to the corner. This rock seemed likely to make the turn impracticable.

The amateurs were inclined to doubt the possibility of getting onto the shelf at all, but

Rudolph thought that it could be done, and in any event it was the only chance in sight and only closer inspection could tell us whether the corner could be turned. We accordingly roped off and went down hand over hand into the window and worked cautiously down and around the small gendarme to the bottom of the next cliff. Detaching the rope after Rudolph had come down required the use of some persuasive language but it finally yielded and Rudolph joined us and proceeded to work his way up the face of the cliff to the ledge. A recess at that point enabled one of us to follow and anchor to secure Rudolph against a crumbling hold on the traverse. As he worked out toward the white rock he called back to us that it did not look good and that unless there was a secure hold at the end of that white rock we were beaten. In a moment, however, he shouted "it was made for the purpose, come on." We found that the point of the white rock at the far end afforded exactly the hold that was essential to make the last step and the turn of the corner possible.

No further critical passages were encountered. The traverse to the shoulder and the ascent to the ridge was good, but the result was never in doubt. The arête was magnificent and the traverse of the "threadlike crest with nothingness on either hand and the blue sky above" was thrilling and satisfying. It was broken at one point and we climbed down into a small rock and snow walled niche where the noon-day sun had melted the snow and formed a welcome pool of water practically at the summit of the mountain.

The ridge was in general very sharp, but at the highest point it broadened into a narrow, flat platform upon which we took great satisfaction in building a cairn and leaving a record. We reached the top at 3:30, and as we sat down to eat our lunch at 4:00 o 'clock Rudolph remarked that the climb had involved several portions of very great difficulty. He thought we were not only the first but quite probably the only ones who would ever stand on the top of that flat topped gendarme, as it seemed clear that by taking the southerly crack we would have come directly to the wall where the projecting white slab had first imposed difficulty and then rendered aid. We took this route on the way down and although it was necessary to either rope off or cut ice steps at a number of places, it certainly offers both a quicker and an easier way than that by which we ascended.

The view from the top was limited by the smoke to short distances. The ridge immediately to the west is much lower and not impressive, while the valley between, at its upper end, at least, is merely rock slide and glacial debris.

We had dreaded the return down the cracks, but on that occasion at least there were no falling stones which we did not dislodge ourselves. It is a difficult mountain on which to retrace one's steps, but with the aid of a number of small stone men built on the way up, we got back without much loss of time and reached the ridge from which we began the climb just before it became too dark for rapid rock climbing. Reno's camp fire looked like a nickering match across the valley but proved both large and welcome as we threw ourselves down beside it at 9:45 after a decidedly wearying struggle with the dense undergrowth of the upper end of the valley.

That night was milder than the preceding, and after a supper, which was excellent even though the menu was restricted, we were prepared to take full advantage of the opportunity for sleep which it afforded.

The western side of the Royal Group has never been described so far as we know, if indeed it has ever before been seen. The peak of Mt. Queen Mary is offset sufficiently to the west to permit a view of it for a considerable distance to the south. From that viewpoint it would seem that that face presents only sheer precipices and that the peaks are in general inaccessible from that side.

To the south of Mt. Queen Mary the ridge widens and the wall and buttress type of structure described above, seems to characterize this one peak of the group only.

Whether there is any other route by which Mt. Queen Mary can be ascended interested us very much. It is certain that it would do no good to reach the ridge any sooner than we did and so far as we could judge, it would be impossible to do so any farther to the south. Whether it can be done by ascending the third buttress all the way or by climbing to the col between Queen Mary and Prince John we cannot say, but it seemed improbable, and in any event the starting points would be too inaccessible to make these routes available. It would seem, therefore, that the narrow ledge which we discovered and the hand hold on the projecting white rock are indeed essential to the successful ascent on that side. Minor variations in other parts of the route are of course possible.

Whether the mountain can be climbed from the east probably depends upon its condition at the time of the attempt. Studying it as we approached, and before actually starting on our climb, we all thought it impossible, but in the better light of the following day Rudolph was inclined to believe that by getting into the col at the foot of the northeast arête and working up close to the edge a considerable distance it would be possible, unless the amount of step cutting involved was prohibitive. It would be an ascent strongly suggesting the face of Mt. Victoria, which was accomplished by Rudolph and Mr. Fynn last season after failing on three previous attempts, and at the best would involve much extremely steep climbing on snow and ice which is exposed during the first half of the day to the full effect of the sun.

Returning the following day we spent an hour and a half stalking elk in the upper end of the Royal Valley and witnessed the amusing spectacle of an apparently hypnotized bull who remained after the others disappeared in the distance and stood like a statute gazing at Rudolph for some minutes as the latter called and waved to him to move over onto an adjacent snow patch and have his picture taken. Although Rudolph expressed his opinion of his intelligence in several languages the elk still stood and gazed until Rudolph rose and waved both arms. Then he slowly started across the valley but the farther he went the faster he travelled, and by the time he had reached its far side he appeared to be breaking all records for the course. It was agreed that the effect of Rudolph's hypnotic influence seemed to be wearing off. In spite of this delay, our early start and lighter packs permitted us to reach Palliser Pass in time to pack our duffle and move over to the Alpine Club Camp for supper that evening.

As with regret we wrote "finis" to that chapter of our outing we voted it a conspicuous success and a permanent and delightful addition to our mountain memories. Best of all, we had made our peak.

The First Ascent Of Mt. Birdwood.

By C. F. Hogeboom

Mt. Birdwood needs no introduction to the members of the A.C.C. who attended the Palliser Pass camp. On the last day's trip into camp they have seen it to the east of the trail and from the camp could be seen the upper portions of the southwest face—a rock climb to the very top.

When Mr. Waterman and myself planned a trip of ten days in advance of camp, we had nothing more in mind than an attempt at Mt. Queen Mary in the Royal Group, but when Rudolph suggested that we had time for a try at Mt. Birdwood on the way in, we agreed at once. We recalled Mr. Hall's description of this peak in his account of his climb of Mt. French and Edward Feuz's prediction of the good climbing likely to be obtained.

On our way in from Trail Centre we were constantly on the alert for a glimpse of our first

objective. Unfortunately the smoke from forest fires so obscured the view that we could see little until we reached the junction of Birdwood Creek with the Spray when, looming up through the creek valley and about two and a half miles away, we could see the broken northwest ridge of our adversary to be. Mt. Birdwood remained serene and unshaken while we debated on the possibility of working our way up the draw and making camp at its north foot. Finally Rudolph concluded that the upper notch appeared too narrow and broken to get the horses through, so we proceeded about one and a half miles farther south and pitched camp at 6 o'clock on July 21st in a clump of spruce just off the trail and east of the north end of Lake Leman, which lay concealed on the other side of the Spray.

Waterman, Rudolph and myself soon started in to gather brush while Reno Fitten, our packer, cook and friend, rustled supper. Here I had a mishap. In bending down to gather some cut brush I did not see a twig projecting directly upward and this scraped violently across my left eyeball with painful results. The only cheer I could extract from the event was in the thought of my narrow escape from more serious consequences. We turned in early but my eye gave me so much discomfort that about 2 o 'clock I was forced to waken my side partner and beg for relief. After much manipulation of handkerchief, electric torch, boracic acid, etc., he extracted a large splinter, to my very great relief.

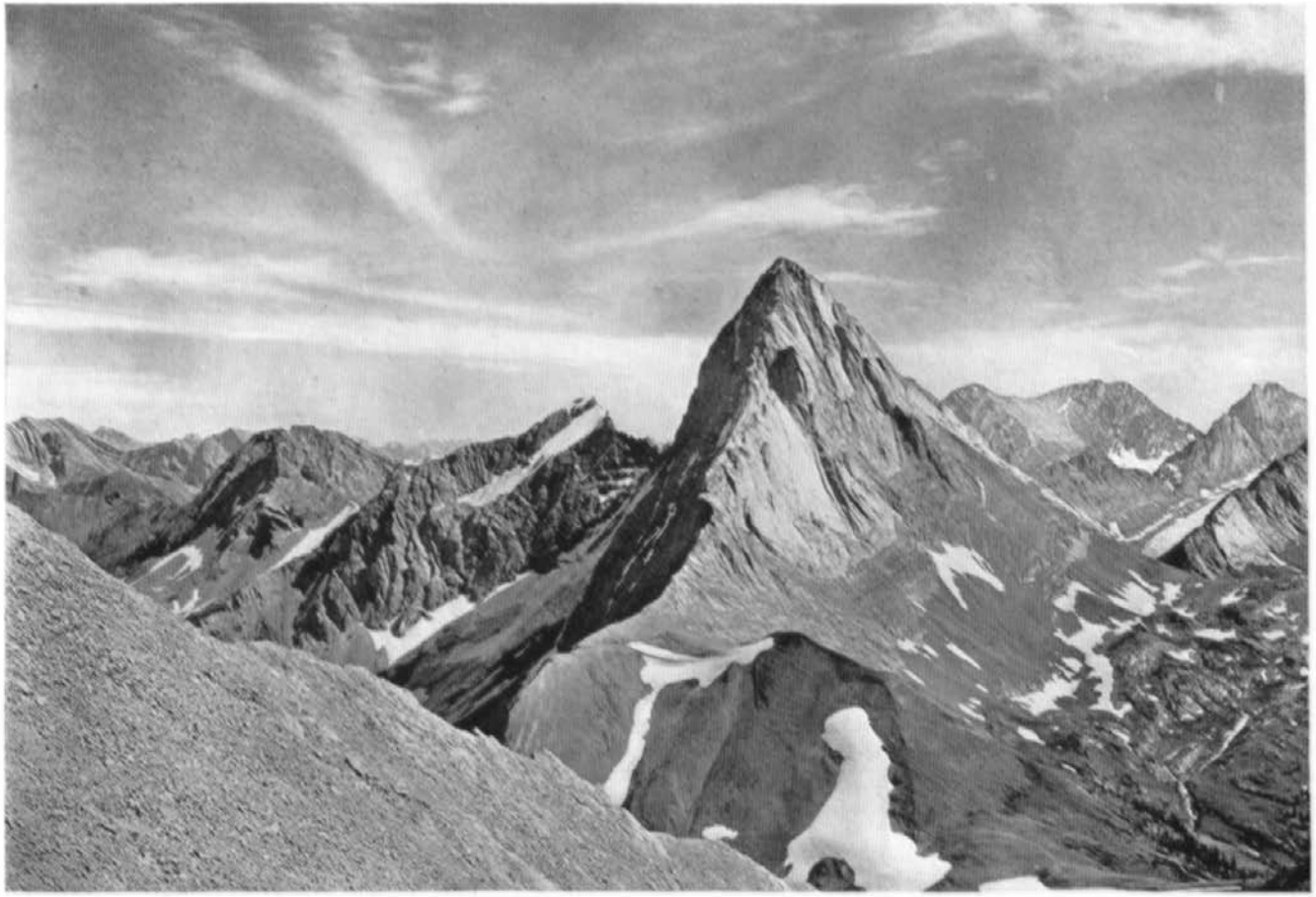
The next day was fine and Rudolph and Waterman started up the draw to survey the landscape o'er and pick out a practical route, leaving me to ignominious applications of boracic and wet cloths. They returned in time for supper with the report that we would have to make the climb entirely in gulleys and chimneys on the southwest face as both ridges were impossible. I gathered that if we could get into the lowest chimney and get out of it at the top we had a good chance of building a cairn.

The next day was the finest and most free from smoke which fell to our lot during our entire trip and we started up the draw at 7:25 full of "vim and vigour." About two hours tramp brought us to a ridge of about 8,500 feet elevation, where I got my first complete view of old Birdwood.

It rose from the valley just ahead with a long broken ridge running from northwest to southeast and leaning up against its broad and steep southwest face was a great talus from 900 to 1,000 feet high. Just above this talus and running south toward us was a ledge leading toward our first chimney. Above and always bearing to the north was a series of three other chimneys leading all the way to the summit ridge. No snow, no growth of any kind, even moss —just rock. It surely looked good to us. We made our way down a rather steep snow slope to the bottom of the valley and toward the talus. Near the foot was a little stream, which we really should have taken along with us, for old Birdwood is a strict prohibitionist with "No Drinking" signs clear to the top and back again.

At 10:00 o 'clock we started up the coarse scree and, at a big rock just below the top, cached our axes and nailed boots, changing to rubber soles or, in Rudolph's case, new Kletterschues. Then we roped up and at noon started on the real climb. We made our way along the ledge to the right for some 300 feet and swung around a nose into our first chimney without difficulty. We had started. The chimney quickly widened out to a gulley of some 300 feet high with considerable rotten rock in it. We worked up and to the left into a steep and narrow chimney of about 100 feet high, and for the upper 30 feet we would just stretch our arms from side to side both walls being rather smooth and the steep floor covered with ice. Here an axe would have solved all our difficulties, but we would have been the poorer for the loss of a very interesting bit of climbing.

Both Rudolph and Waterman successfully achieved it with arms and legs stretched to the



Mt. Birdwood (10,160 Ft.) From N.W.
Photo, Topographical Survey, Interprovincial Boundary

limit to the opposite walls. I could at times just see Waterman's head between his outstretched legs as he looked around for the hand-holes that were not there. This method was so lacking in every element of grace as viewed from below that I devised a method of my own and, thus proceeding, rapidly made my way to the top without being hoisted on the rope. If you suppose for an instant that every movement was not of extreme grace you are much mistaken, and this I say without fear of successful contradiction since there was no one below me.

Now, all we had to do was to get out. Both side walls were smooth, the right extending up indefinitely and the left about twelve feet high with a top gently rounded away from us. Directly ahead was an overhanging wall and below a tongue of ice a foot or so above the rock floor. The only way was over the left wall, so Rudolph got up on Waterman's back, then on his shoulders and received a shove with the hands as he finally went over the top. With the aid of the rope, it was simple work for the rest of the party. It is doubtful whether the top could have been reached had not that ice given just that extra foot or so from the rock bottom. Since conditions probably vary with the season, this ice may not always be available and climbers by our route would do well to ponder seriously the advisability of carrying up sufficient ice for use at this point. An alternative, of course, would be to include in the party a climber approximately two feet taller than Waterman.

Now we were out in the open for a while till we came to the top of a sort of buttress. We crossed to the massif on a very rotten ridge, straddling it part of the way and losing some height. After a bit of face work we managed to get into a gully leading diagonally up to the left and then into another steeply pitched chimney where the walls were entirely without hand-holds and about five feet apart. Here three different methods were used with apparently equally good results. Rudolph stuck to his system of outstretched arms and legs. Waterman worked his left foot into a crack along the base of the wall and held it there with a twist of his leg, both arms being on the opposite wall part of the time. I had my back to one wall and feet against the other. This bit was about twenty feet long and led directly into a gully extending up about 400 feet to the top ridge. A short traverse of a rotten ridge led to the summit (alt. 10,160 ft.), which we reached at 2:45, four and three-quarter hours from the foot of the talus.

Etiquette on first ascents seems to require that the cairn should be built before even taking a preliminary look around or a bite to eat, possibly because of the danger of omitting this function through sheer forgetfulness. At any rate Mt. Birdwood was treated with all the formality it deserved. Rudolph proclaimed that it had been ‘’ a peach of a climb’’ and we heartily agreed with him.

No doubt, in common with other members of the A.C.C. I have had considerable difficulty in convincing certain friends of the prime necessity of climbing mountains. With utmost conviction, I have advanced all our arguments only to be met with a smile of pity, the shrug of skepticism and the stock objections: “the risk,” “what do you accomplish?” “The King of France and twice ten thousand men,” etc., etc. Comfortable sanitariums have been recommended to me and the best of medical treatment guaranteed. Now-a-days I use an entirely different method of handling this situation. I simply state that we have to go up to build the cairns. “Every peak of 10,000 feet must have a cairn, you know. It's a rather complicated thing to explain and I doubt if I can make myself clear.’’ Then I turn, on the pitying smile. The first application of this method brought results far beyond my wildest fancy. When used with discretion, however, I have found it to produce gratifying and permanent results.

The view from the top is very fine. To the south lies Mt. Sir Douglas (Haig) and we could trace Dr. Hickson's route up one of the parallel glaciers to the ridge. Just over the left shoulder of Mt. Sir Douglas was the white dome of Mt. Joffre in the distance. To the right lay the splendid

Royal group, and you may be sure it received our most respectful attention, as Mt. Queen Mary at its northern end was our next objective. Of course, Mt. Assiniboine dominated everything to the northwest while near by and directly to the north lies Mt. Smuts, about 500 feet lower than Mt. Birdwood, but giving every promise of a splendid climb. The best approach to this peak is probably up Birdwood Creek. From the upper slopes of Mt. Birdwood we could see that the narrow notch which looked so dubious on the way in, was in fact quite practical and that we could have camped near the north ridge and thereby considerably shortened our approach.

While I have never climbed in Switzerland, I believe the views obtained from Rocky Mountain summits are quite different from those obtained in the Alps. My impressions of the latter are obtained principally from the stage setting for the final act of the opera "Alone at Last," given some years ago in New York. The lovers for two acts have had great difficulty in achieving any measure of solitude and finally climbing to the summit of the Jungfrau, are ‘’ alone at last." The scenery here is superb with wild crags, some bare, some snow-capped, but all bathed in the sunset glow and towering above all, an immense spruce. I have never seen anything approaching this in the Rockies where unfortunately the spruce do not seem able to grow with any degree of luxuriousness above timber-line.

Our lunch proved a thirst producer but we were without water. Just below the summit on the steep northeast face was a patch of snow and not caring to risk the climb down for it, we tied a small meat tin to a string and endeavoured to drag up some snow, but with meagre results. We simply retained our violent thirst and at 4:00 o ‘clock started down by the same route. I note only of this return trip, that the ice in the narrow chimney was circumvented without difficulty, for Rudolph looped the rope around its raised top and slid down with its help to the bottom. There is considerable loose rock in some gullies and even while using the utmost care a certain amount is bound to come down—just enough to make things interesting. But conditions are nowhere as bad as found on the south face of Mt. Sir Douglas, which will long remain in the memory of certain Club members as the supreme rubbish heap. At 7:30 we were back again at our cache where we changed back into our nail boots and after a short rest started down the 900-foot scree slope.

It was here that, for me at least, Einstein's theory of Relativity had its most convincing confirmation. Why is it necessary, may I ask, to send expeditions to the antipodes to prove that our measuring rods for size, time, velocity, etc., are not of fixed value but relative only, when the Rockies are so available for a complete demonstration? I know absolutely that 900 feet of scree at 8 a.m. is not the same as the same slope at 8 p.m. The "Vim and Vigour" of 8 p.m. may seem the same as that of 8 a.m., but a scramble on vilely coarse scree soon proves it quite otherwise. At 8 a.m. there was no nail working its red hot point into the ball of my foot, neither did my tongue have "chrome-tanned" plainly stamped on both sides. In the morning my companions did not suddenly break into a wild gallop and leave the landscape "to darkness and to me." And if they had done so my temper would have remained unruffled. That scree slope at 8:30 p.m. is exactly 19,002 feet high.

There is a mode of descending steep slopes which I fancy most of us have used from time to time, and described, I believe, in Raeburn's book on Mountaineering. It consists of a rhythmic sequence of three quick steps, a pause, then more steps, etc. The pause somewhat checks a descent which may become too rapid or out of control and the body weight is brought alternately on the right and left legs. It was the method which Waterman used in accomplishing his marvelous descent, but in my case it availed me nothing. No amount of ingenuity could change the fact that just about one half the time my sore foot had to carry my weight, pause, sequence or anything else

to the contrary notwithstanding.

I earnestly advise mountaineers making an ascent of Mt. Birdwood to allow ample time for a dignified descent of this slope, and if Waterman is along, manage in some way to give him a good drink at the shoe-cache or he will assuredly break into a lope and leave you to find your solitary way to the little stream near the foot. This is where I found him with Rudolph. There were still some traces of moisture in the deeper parts of the stream bed, which they had overlooked in the gathering darkness.

After a short rest, we again hurried on our way. We had to grope our way about a bit at some parts of the three mile return trip, and I remember one quite awkward place at a steep pitch where the stream bed was very badly broken. However, we arrived safely in camp at 9:50 after fourteen and a half hours of pretty strenuous work.

Of the joys of the safe return from a successful expedition, of the solid comfort of the campfire, supper and companionable pipe after a long day on the mountains, I will say nothing, for members of the A.C.C. know them well. There may be other things as satisfying, but their names are not legion.

The Climb Of Mt. Jellicoe And The First Ascent Of Mt. Maude

By M. D. Geddes

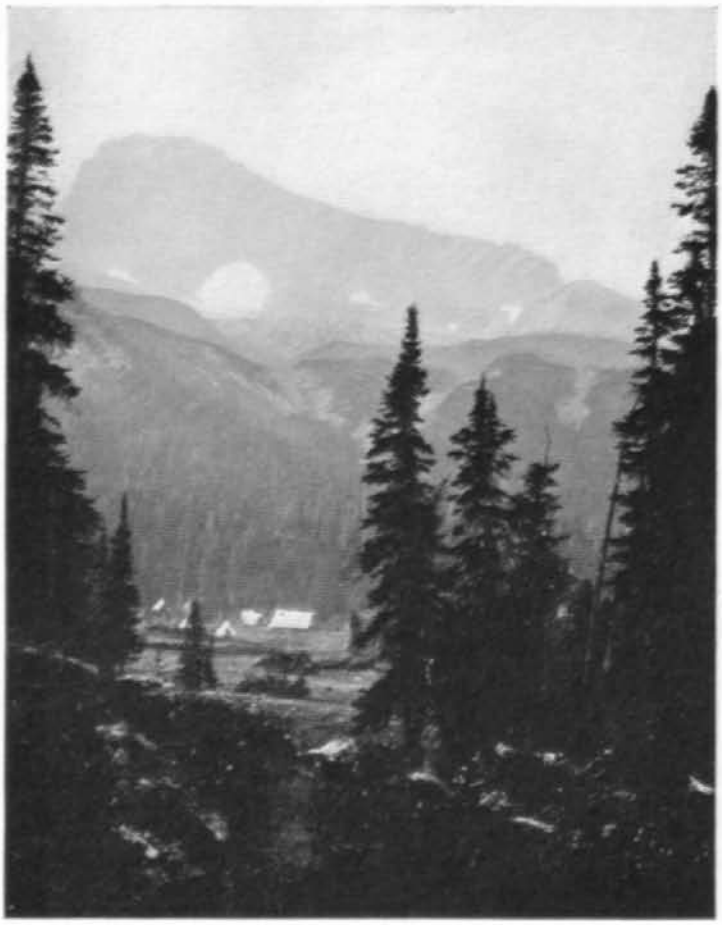
On August 4th, 1922, the two Miss Hendries of Calgary and Messrs. Crawford of Boston and Gillespie of Cochrane, with the writer as guide, left Kananaskis camp at 6:15 a.m. to climb Mt. Jellicoe. Our route lay northward up a grassy, wooded slope, then over rocks and boulders till we reached the marginal moraine of the Haig glacier.

Mt. Jellicoe being on the northeast side of the glacier, the most direct route would have been to go practically due north, diagonally across the glacier comparatively near its snout, but as it is steep and badly broken with crevasses in that locality, we followed the moraine for a short distance before starting across. The Haig glacier is quite large, being fully one and three-quarter miles wide and three miles long. From where we stood, Mt. Jellicoe was directly across from us with Mt. French northwest of it, then Mt. Robertson, and next Mt. Sir Douglas at the head of the glacier. It was a lovely morning, crisp, clear and calm, with the sun just rising over the ridge to the east of Mt. Jellicoe.

We roped before starting on the ice although it looked solid, without signs of crevasses. Before going far we came upon a small glacier table, and, soon after, small crevasses. These became more numerous and larger as we neared the Mt. Jellicoe side and in many cases were too wide to jump, so we had to zig-zag our way as best we could.

Mt. Jellicoe can be an easy, medium, or difficult climb, according to selection of route. It stands almost an island in a sea of ice, connected only to Mt. French by a narrow rocky ridge that is fairly difficult to climb from the south and appears absolutely impossible from the Smith-Dorrien side. We selected a medium route, using a snow slope as far as possible and were very careful where ice and snow met as there were signs of a bergschrund. The snow led us to steep shale with rock out-cropping. Here we switch-backed ever upward over a veritable paradise for fossil hunters. The shell impressions of marine life, presumably Cambrian period, were in abundance and it was difficult to tear some of the party away from this rich find. We kept up the shale till we came to the arête. At this point we encountered; a lot of badly broken rock of a very slabby formation and

Mt. Maude (9980 Ft.) From Haig Glacier. Photo, M.D. Geddes



The Kananaskis Pass Camp, Mt. Jellicoe (10,065 Ft.) In Distance. Photo, D.J. Mcgeary

two short chimneys which gave us a fair taste of rock work. We found Mt. Jellicoe (10,065) a sort of double header having two cairns with some good, jagged, knife-edge work between. When we arrived at the first (the most easterly cairn) we could easily see the other and for fear it might be a shade higher than where we stood, decided to visit it. The most thrilling part of all was this narrow ridge that separated the cairns. The knife-edge was quite spectacular. The north side in places was a perpendicular wall while the south had long, steep slopes and rough pinnacles jutting out in weird, fantastic shapes.

We reached the second cairn at 10:55 and found it larger and better built, so concluded it was in connection with Interprovincial Boundary Survey work.

It was a glorious day, though a little smoky, yet we got a magnificent panoramic view of the higher peaks, Mts. Joffre, King George, Queen Mary, Sir Douglas and many other lesser lights south and west of us, then to the north a reasonably close-up view of Mt. Smith-Dorrien. We spent some time with the field-glasses trying to locate a favourable route up Mt. Smith-Dorrien and feel we found two possible ways, yet concluded neither would be easy and both might prove impossible. So far as we could tell, Jellicoe is an impossible climb from the north.

We returned by the same route and Mr. Gillespie spent some time collecting fossil specimens, but easily overtook us before we reached the snow where we did some glissading and were soon on the ice. At once we noticed what a wonderful change the sun had made. What had been splendid, solid walking in the morning was now slushy and the murmur of water running into the crevasses made a sort of pleasing melody. We came across one or two tiny moulins, but nothing like the large ones some of us saw a few days later on the glacier north of the col between Mts. Robertson and Sir Douglas, when returning to Palliser camp.

We returned across the glacier by a slightly different route and reached the south side rather nearer the snout than the way we came. The water was rushing down this slope an inch or two deep, so we headed towards the moraine as directly as possible. Here it was very steep in places, so we had to be careful, otherwise would have had all kinds of rock accompanying us. Even with all the care we could exercise there were a few friendly stones that seemed to invite us to use them as one might a toboggan.

We also varied our route down the grassy hillside, catching delightful vistas of Mt. Beatty and its glacier as well as Maude Brook, which although clear and almost dry in the morning was now a milky-coloured foaming torrent. The creek which ran past our tents into Turbine Canyon, one of the wonder spots of the Kananaskis camp site, was regularly a clear, staid little stream each morning, but after old Sol got busy on the Beatty glacier it changed completely and the rock flour from the grinding of rocks and ice at the bottom of the glacier gave it its milky colour.

At 2:45 we were back ‘’ home’’ well satisfied with the enjoyment of a most delightful and varied outing and ravenously ready for afternoon tea and a little later a dip in that lovely sylvan Lake Lawson, just a short distance southeast of camp.

The First Ascent Of Mt. Maude

On the evening of August 5th, 1922, Rudolph Aemmer and the writer took a leisurely stroll from Kananaskis camp up the beautiful winding trail past Maude Lake to the height of land between Mts. Maude and Beatty. The object of our walk was to give Mt. Maude a look-over with the field glasses preparatory to a proposed climb the next day. During the previous night as well as the forenoon of August 5th, it had rained heavily, so there was no climbing that day. The eight of us who were at that delightful auxiliary camp, some nine miles by trail southeast of the main camp

at Palliser Pass, spent the forenoon around a small fire under the fly discussing which mountain should be selected for our next climb. Two of us wished to finish the Mt. Robertson climb which had been so nearly completed, when approaching darkness forced us to retreat some three days before; but as that would mean only three including Rudolph, it was agreed the unselfish thing would be to find a good climb in which all who wished might take part.

After studying the mountain for some time, Rudolph concluded there were three possible ways from the south. The easiest way we imagined would be up a long shale slope to a col between Mt. Maude and an extended slabby ridge jutting eastward, then by way of what looked like a somewhat difficult arête to the top. Another likely way was partly to circle the southwest base on an upward angle over shale and rock to the western arête and follow it to the summit. The third proposed route was the direct way up the south face and meant rock work almost from the base. This latter gave promise of a most interesting climb and we decided to try it next day.

The following morning at 7:20 eight of us started, led by Rudolph. Upon reaching the height of land between Mts. Beatty and Maude we stopped to have a final survey of our proposed route. It was a lovely, calm morning and the atmosphere was less smoky than on any of the previous days in camp.

While intently gazing on the south face we heard rocks rumbling on the rocky ridge east of Maude. Rudolph at once said it must be goats, for Maude is noted as a goat rendezvous. Quickly we turned the glasses and soon spied a fine, big goat gracefully bounding upward from rock to rock, till we saw him silhouetted against the sky-line. He seemed to be a real husky billy, well able to take care of himself in any tight corner.

The sight brought the following lines from ‘The Crag-master’ to the writer ‘s mind :

“On dizzy ledge of mountain wall, above the timber line,
I hear the riven shale-rock fall toward the stunted pine.
Upon high paths I tread secure. No foot dares follow me.
I ‘m master of the crags, so love to romp above the scree.”

Regretfully we turned from gazing on the graceful mountain climber, who required neither Swiss nails, nor ice-axe, and faced the short shale slope which lay between us and real rock work. Here, after “caching” our ice-axes, we roped and Rudolph led off with Miss N. B. D. Hendrie, Miss J. B. Wilcox and Miss M. P. Hendrie. The second rope led by the writer included Messrs. C. R. Adams, E. W. Crawford, and Wilbur Gillespie. After leaving the shale we started up an old, rocky watercourse which, owing to an extended stretch of steps worn exceedingly smooth in places, might well be called the “Goats Stairway,” as it seemed to lead towards their airy, attic home. Owing to the “tilt of the rock” being outward, coupled with the water-worn, smooth surface and the steepness of these massive, mountain steps, progress was difficult and slow. The whole formation was slabby and in places the angle of the rock strata so acute that we had to rely almost entirely on foot and finger friction. We kept steadily upward until faced with a sheer buttress which forced us to traverse eastward for a short distance. At this point, those of us who had rubber or rope-soled shoes, put them on. Rudolph then asked me temporarily to attach two of his party to my rope while he did some scouting. After a determined effort to find a direct route, he decided to traverse still eastward, which we did, gaining altitude wherever possible, until we reached the east arête about half way between the col, referred to earlier in the article, and the top.

We found the arête not nearly as well defined as it appeared from below and more difficult than we expected. On two occasions we had to leave it on account of perpendicular walls, which in one case included a slight overhang. The first of these presented us with the alternative of going up

what appeared an impossible vertical rock face or traverse south around a very ticklish corner. We chose the latter and it certainly was an awkward spot. Owing to the perpendicular, scaly formation, hand and foot holds were slight and insecure, and you could not see around the bulge. From there on it was easier, yet looked very formidable. Of course we could not see the top and soon we came to what appeared an impassible wall, but Rudolph found an irregular, badly-broken chimney with a sloping side which led us up within sight of the top.

Upon reaching what at first we thought was the top, we found a slightly higher point some distance ahead and between it and us a real knife-edge. This in places was practically vertical on the north side, and steep and badly broken on the south. Then, to make matters still worse, it had a jagged, saw-tooth edge and some of the gaps were so narrow that a sure-footed, seasoned climber could safely step across, while others found it safer to go on all fours. We reached the top, 9,980 feet, at 2:35, ate our lunch, and built a cairn as hurriedly as possible, for a thunder storm was bearing down upon us from the southwest.

The lightning flashes were vivid and frequent and steadily coming nearer. It is truly grand to see a thunder storm from the top of a mountain. As we were re-crossing the knife-edge the lightning was dangerously close and one of my party had a very small rucksack so well filled that the heel of one of his climbing boots was exposed. One flash made a long sizzing sound on these nails and Rudolph, who was behind, shouted ‘’ Get out of here!’’

There were lots of thrills in crossing that knife-edge. The air was charged with electricity and the jagged stabs of lightning were playing all around to the mighty crackling music of Heaven’s dread artillery.

Then we were fearing a heavy rain or snow storm, which would make the rocks slippery and prevent the use of our rubber soled shoes. The ascent was difficult and dangerous enough on many of the steep, slabby places where light, friction footholds were practically our only means of contact and it made us wonder what would happen should we be forced to make the descent under less favourable conditions. Providence, however, was kind, withholding the rain till we reached the shale.

In descending we followed the same route till we reached the spot where we first struck the arête. From that point we endeavoured to follow the arête to the col, but found this impossible so swerved northward, working our way down to the snow on the Haig glacier side, ultimately reaching the col, and then turning southward went down the long shale slope to Maude Lake.

As we came nearly on a level with the spot where we had “cached” our ice axes, three of us traversed for them and joined the main party at the Lake. Camp was reached at 8 p.m. and the resourceful cook of Kananaskis camp had an excellent supper steaming hot on the table in a jiffy to which every member did full justice.

The Second Ascent Of Mt. Sir Douglas

By T. O. A. West.

The pleasant day was rapidly nearing its close. We had returned early from our climb; enjoyed a hearty supper after an invigorating plunge into the chilly waters of Belgium Lake, and in small groups were discussing the events of the day prior to adjourning to the camp-fire, when, upon turning aside to scan the prophetic sky, I felt a touch on my arm, and a quiet voice gravely enquired: “How’s your anatomy?” Visions of the tragedy of 1921 flashed across my brain, and I

swiftly turned aghast, but to meet the quizzical gaze of Mr. Wheeler, who was enquiring in this novel way one's inclination and physical fitness to tackle Sir Douglas on the morrow, a party for which he was then making up.

It was a thrilling moment, and a word sufficed for answer, for it was a distinctly worth-while peak, and views from many angles during the previous few days had steadily increased the desire to try conclusions with the challenging massif, and to hope against hope that a climb would be attempted during Camp. The climb had not been posted on the notice-board nor made public, and so none were aware .of the personnel of the party until the following morning, when, at the cold, grey hour of 4 a.m. a round dozen of us congregated in the bleak dining tent and shiveringly prepared a hasty breakfast. However, it was not until nearly six o'clock that we were finally under way, with the good wishes of Mr. Wheeler ringing behind, and generous lunch bags forming a comforting bulge in our rucksacks.

Rudolph, the ever cheerful, was in the van, and steadily and remorseless as fate steamed us up the first ''mountain" of the day (ages afterwards we swore we had climbed dozens!) we gained the Williams Ridge, where, at 7 a.m. we had a short breather and revelled in a delicious drink from a moss-encircled spring. Rudolph found to his chagrin that we were all there, so found solace in a few minutes critical examination of the objective with his binoculars.

Striking N.E. we swiftly descended to the extensive moraine, and made our way up the fairly level glacier which trends S.W. until we reached the steep snow at the foot of the West ridge of the peak, passing on the way large patches of deeply coloured "Red Snow." At this point we roped, and prepared for business, as it were, the hour being 9 a.m.

Making for the extremity of a tongue of snow leading upwards, we were soon on the steep rock, and for nearly two hours we steadily forged ahead. The going was fairly strenuous, the face lying at an angle of about 60 degrees, whilst the friable nature of the rock demanded care and neatness of movement, but, notwithstanding one's efforts, those following had a decidedly unpleasant time of it on occasions. The W. arête was finally reached at 10:50 a.m., and in a convenient hollow we thankfully rested for 15 minutes and each sampled his favorite form of concentrated nourishment. By this time the various comments on the nature of the rock of Sir Douglas were caustic, to say the least but, as it happened, the most fervent and poetic descriptions were to come later. Resuming the assault, we followed the ridge which towered above us, seemingly at a steeper angle than the cliffs by which we had reached the arête, and the rock was, in places, even more exasperatingly shaly and unstable, although short pitches occurred at intervals, during which one could stand upright on the soles of the feet, instead of the toes and inner edges only, a support which perforce was used throughout the climb. The rock here was of the nature of very steeply sloping slabs, vertical cracks of varying widths enabling one to insert the fingers, and, in places, the sole of the boot, but horizontal ledges or fissures were conspicuous by their absence, and, on the rare occasions when a ledge did appear, it served as the temporary stopping-place of a sliding acre of gravel, shale and boulders. As before, those following were most interesting in their remarks on the scenery in general.

After half an hour or so on the ridge, it was necessary to avoid a large gendarme by making a short traverse to the right, where a smooth face was encountered and surmounted with the aid of vertical cracks to one side. We were now practically perched on the sheer "West face of the peak, and a few moments afterwards we were at the foot of a large ice-filled couloir which appeared to fling itself upward straight into the sky. The ascent of this was perhaps the most dangerous and unwelcome portion of the climb. Where possible, hand and foot-holds on the sides were used, but

owing to its steepness, and the fact that all ropes had to ascend it together—closely bunched—it was of the most vital importance that no holds be disturbed, and this unfortunately was not always humanly possible, so that owing to the precarious holds one was not always able to arrest the downward progress of a loosened stone. Added to this was the fact that up above Rudolph was merrily cutting steps in the flinty ice, the sharp fragments of which, hurtling downward, made their presence felt in no uncertain manner. By this time the remarks from the rear were plaintive in the extreme, and reached a climax of piteous entreaty when Mr. Pollard neatly turned aside a block of ice with his ankle-bone, shortly followed by a well-aimed stone which glanced off his left Knee-cap. The last rope would insist that the others were deliberately throwing assorted missiles at them, and probably believe it to this day.

After an hour and a half of trying work we finally emerged from the couloir, and then were greeted with sight of our objective. Another short traverse to the left and the further ascent of a more irregular face brought us to comparatively easy rocks, over which we quickly scrambled to the summit, where we lost no time in investigating the contents of our lunch-bags. There was practically no snow, only a few traces remaining in the hollows of the rocks, and there were no signs of the cairn which had been erected by the first party to reach the summit.

The hour was 2:30 p.m.; the ascent had been somewhat tiring; the descent promised to be more so; the smoke from prevailing forest fires blotted out all views, and—the actual summit proved to be a few hundred feet away, and perhaps a hundred feet higher. No time was lost after having consumed lunch, and we prepared to do the thing properly by reaching the other summit and leaving our records there. A very narrow and sharp ridge connected the two summits, with a gendarme or tower in the centre, so that this could not be circumvented, but all had to "go over the top," as it were. This was rather nasty, but we felt happier as we clustered on the sharp pinnacle forming the summit, and built a cairn enclosing our record placed in an empty pot of cream cheese, only a few stones remaining of the small cairn erected by Dr. Hickson, who with Edward Feuz first climbed the peak in 1919.

Leaving the summit at 4:10 p.m. we soon realised that if the ascent had been trying at intervals, the return journey was infinitely worse, and without an enjoyable moment, except for a short glissade down a sliding shale slope after we had reached the arête, which really did compensate for a great deal. Rudolph very kindly steered a course past one or two nasty bits, but the descent of those steep slabs, sans holds and sans rope-soled shoes, was a nightmare. Most of the party cast mountaineering ethics and science to the winds and literally slid in sitting posture from one slab to another, gripping betimes with the hands twisted sideways into vertical cracks, so that one's garments suffered considerably in the process, as evidenced next day when photographs of the party were taken in camp. The same route was followed as on the ascent, and the hollow on the arête in which we had rested on the upward journey was reached at 8:30 p.m., after nearly four and a half hours of nervous climbing.

The fact had already occurred to us that it was a question of racing with time, and it was therefore not expedient to indulge in rests, as we were even then a long way from camp, and the shadows were lengthening rapidly. The descent was therefore continued without interruption, and fast time was made down the face of the west ridge, a short detour enabling us to reach a scree slope down which we thankfully plunged in semi-darkness.

With almost uncanny precision Rudolph finally brought us to the foot of the cliffs at exactly the same spot from which we had commenced the climb, and as it was now quite dark, with no moon to help us, we came to the last of our difficulties, and one which very nearly necessitated a

Mt. Sir Douglas (11,174 Ft.) From Summit Ridge Of Mt. Williams. Photo T.O.A. West
Showing Glacier And Tongue Of Snow; Also The Arete And Face Ascended. Couloir May Be Seen Near Summit

bivouac for the rest of the night. This consisted of the descent of a smooth cliff of about 25 feet in height to a very steep snow-filled couloir, which ended in a yawning bergschrund, and thence over the lip of the latter to the névé beneath. Our only light was provided by Rudolph's candle lantern and an almost exhausted pocket flash lamp, and as this illumination was required below at the lip of the schrund, the descent of the cliff had to be accomplished in darkness by the sense of touch only, as no directions as to holds could be given.

The couloir was quite narrow, so that one had to wait until each had negotiated the snow steps, turned a corner, and over the schrund, so that an hour was consumed at this ticklish spot. It was then 11:15 p.m., and after a jog down the upper snow-field the glacier was reached, where we thankfully rested for a few minutes, enjoyed our first real drink of water since the morning, and scrabbled in pockets and rucksacks for stray raisins and the wreckage of chocolate bars. The nervous tension under which all had been labouring1 for the last few hours was now at an end, and Rudolph especially must have welcomed the relief, as the strain upon him had been so magnified by his added responsibilities. He acquitted himself nobly and well, and his "children" made short work of telling him so.

In a straggling line we then followed the dancing will-o'the-wisp of his lantern along the glacier, slopping through innumerable streamlets and sleepily tripping over stray boulders until the moraine was reached. Passing a veil over this stage of the proceedings, we greedily imbibed at our cool mossy spring of the morning, and in a more or less subconscious state of mind climbed ridges and valleys without end until the glow of the dying camp-fire appeared in the distance.

Summoning up our last remaining lung-power, a yodel shrilled across the valley, and in a few seconds we were rewarded by an answering shout, followed by a leaping flame as the camp-fire sprang into active being. Conversation for the next few minutes entirely consisted of a discussion as to what would form the most appetising dish for our belated supper, and corn soup won the day, one member going so far as to declare he could smell it cooking!

The next hour and a half were spent in the exasperating and wholly exhausting labour of descending into the valley and climbing two more ridges through a tangle of fallen burnt timber and outcroppings of rock. Rudolph's candle had finally given up the ghost after its hours of heroic efforts, and an eerie sight was presented as the party stumbled onward, now thoroughly tired, rocking from side to side and eke earthward like a set of nine-pins. One lady of the party was fast asleep, and perforce had to be awakened upon reaching camp.

The lake outlet stream was waded and camp reached at 3:30 a.m., where we found two kindly souls—princes, we named them—had heard our call, made up the fire, and had the stove going in the cook-tent, so that we soon realised our hopes of hot corn soup, and ravenously enjoyed a huge ration of it, flanked with ham, tomatoes, pie and coffee. We felt better after that, and soon wriggled into our sleeping bags after our 25 hours' absence, emerging in plenty of time for lunch, and feeling quite refreshed and none the worse for the climb, but, rather, very happy and elated over our success.

On future climbs of Sir Douglas, one would advise a small party; an early start—by moonlight if possible—a flask or two of water, and—an extra pair of breeches!

—Q.B.D.

SCIENTIFIC SECTION

Forest Line

By Francis J. Lewis

The transition belts between great tracts of forest and wide stretches of herbaceous vegetation are regions of great interest. When the change takes place at high altitudes on mountain slopes it attracts the attention of the artist and lover of nature, by reason of the beauty of the vegetation.

While the causes affecting the change from forest to grass land are to some extent understood, there may remain many factors whose importance varies greatly in different regions. The replacement of forest by meadows of alpine flowers or by a tundra type of vegetation is due to a variety of causes which vary according to climate, topographical features and the genera and species composing the flora. In the Rockies there is ample material for study, as the forest line ceases from two thousand to three thousand feet below the higher ridges and summits.

A little observation will show that the different types of forest trees with the shrubby and herbaceous plants usually associated with them, attain very different altitudes in the same district. Obviously this is due to broad climatic features and this becomes more certain when we find a gradual depression of the altitudinal limits on passing northward. The Rockies form the meeting place of two types of coniferous trees; those which extend from the mountains to the Atlantic and others whose area of distribution is from the Rockies to the Pacific. No eastern dicotyledonous tree reaches the Rockies except certain species of poplar of which the best known are the aspen (Populus tremuloides), Populus deltoides, and Populus balsamifera, the latter two only penetrating up some of the lower valleys in the south.

The main forest types of the Rockies belong to the Pacific floral province and either die out in the mountains or only reach as far east as the foot hills. The only Atlantic type forming forest of any extent is the white spruce (Picea Canadensis), and this has been replaced in the valleys and on the lower slopes in many areas, by the Pacific lodge-pole pine (Pinus Murrayana).

A number of forest trees are confined to the valleys and rarely or never reach timber land. Of these the most widely distributed is the lodge-pole pine. Extending from Alaska to Colorado and from the Pacific coast through the mountains, its eastern limit is reached where the foot hills merge into the prairie in the south, while about the latitude of the Lesser Slave Lake it is met by the Atlantic jack-pine (Pinus Banksiana), and the two intermingle for some hundred miles east of the mountains. The Pacific coast type differs slightly from the mountain type, the two usually being considered as varieties of the same species. This is the most familiar pine along the Canadian Pacific Railway belt, usually growing in dense stands seldom ranging more than a hundred feet in height and frequently a small tree of thirty or forty feet. The undergrowth between the older trees is usually thick, consisting of a number of shrubby plants such as Shepherdia Canadensis, Menziesia glabella, and herbaceous plants, of which the most common are Anemone multifida, Arctostaphylos Uva-ursi, Listera con-vallaroides and Calypso bulbosa. The upper limit is usually 6,000 feet although outliers of this type of forest may sometimes reach 6,500 feet. The replacement of burned white spruce (Picea Canadensis) by this tree is a constant feature. Up Forty-mile Creek the slopes and floor of the valley are covered with the stools of burned spruce while saplings of lodge-pole pine form a scattered brush. In the course of time this valley will be a dense pine forest with but little trace of the spruce remaining, like the lower part of the Spray valley. During dry

Fig 1 - Pinus Murrayana Forest Near Field At 5,400 Ft.

Fig 2 - Picea Engelmannii Forest At 6,600 Ft. On Healy Creek.

weather in early or middle July an immense amount of pollen is discharged from the male cones, sufficient to cause a thick yellow haze in the large valleys.

The trees which reach the forest line are associated with a different flora and often become much modified as they contend with the adverse conditions at high altitudes. Of the Atlantic types only the white spruce—and even that only occasionally—reaches the forest limit.

Timber line, forest line, tree line, scrub line are terms sometimes used with very different meanings. Three zones can frequently be seen, their presence depending upon different factors, of which the most important are topographical conditions and local variation in snowfall. Forest line is the altitudinal limit of close-grown trees. But trees either of normal size or stunted into bushes or even trailers may often reach many hundred feet above this point. We have thus, forest line, tree line and scrub line.

The forest at high altitudes is generally formed of Picea Engelmannii (Engelmann's spruce). This zone does not descend much below 6,800 feet and rises in some places to nearly 8,000 feet, but its lower limit is often irregular and the upper limit may vary as much as 600 feet, often showing different altitudinal limits on opposite sides of the same valley. The lowest limit is reached on slopes with a northern aspect. Such a feature tells us nothing about the factors operating to limit tree growth, it only suggests a number of factors, such as decreased sunlight, increased humidity, lower temperature, slowly thawing soil in the vegetative season and a greater or less depth of snow in the winter months according to the local conditions of wind averaging over long periods.

A number of other genera are frequently sub-dominant with Engelmann's spruce such as Abies balsamea, Pinus albicaulis and Larix Lyallii. The actual edge of the forest may in some cases yield abruptly to herbaceous vegetation, and this particularly the case on passes where a comparatively level col with a humus soil is flanked by steeply rising rocky slopes. In such spots the transition may often take place in a few yards and the boundary does not indicate true forest line, the stages of isolated trees and scrub being absent on account of topographical conditions.

The floor of the spruce forest is formed of deep wet humus carpeted with Cassiope mertensiana, Moneses uniflora, Anemone occidentalis, species of Saxifrage and Pyrola. Owing to the dampness of the humus and the fact that snowbanks often linger into July, fires have seldom penetrated these forests. At, about 7,200 feet occurs the tension belt where forest yields first to groves and even isolated trees and then to patches of scrub. It is amongst the groves and isolated trees beyond the actual forest line that the alpine meadows are found. Of many different types according to aspect, slope of ground and amount of moisture, the vegetation here shows more diversity and greater profusion of flowers than any other regions either in the temperate or tropical belts. On wet ground fed by snowbanks are found Antennaria lanata, Caltha leptosepala, Valeriana Scouleri, Pedicularis racemosa, Castelleja pallida, Erigeron salsurginosus. On drier ground and slopes the most conspicuous plant is the snow lily (Erythronium grandiflorum), which in July often forms stretches of gold alternating with masses of the white-flowered Anemone occidentalis and the purple heath Phyllodoce empetriformis. The chief trees in the grove or park-land zone are the balsam fir (Abies balsamea), white-barked pine (Pinus albicaulis) and the alpine larch (Larix Lyallii). None of these trees by themselves form forest but their habitat is the timber line. The alpine larch in particular often occurs as a fringe of woodland on ledges, contrasting with the rest of the vegetation by the vivid green of the young leaves in the spring and its golden colour in the autumn, for it is the only deciduous tree at high elevations. The transition zone from forest to alpine herbaceous vegetation may extend for miles where the ground becomes plateau-like at about 7,000 feet, and in such places the development of parkland and meadow is seen in its greatest beauty. In

Fig 3 - Snowslide Vegetation On The Bourgeau Range At 7,000 Ft., Covered With Mat Balsam Fir.

Fig 4 - Meadow Land And Groves Of Larix Lyallii At 7,200 Ft. Near Mt. Bourgeau.
In the background is Plateau Land at 8,300 ft., covered with Dwarf Willow and Arctic-Alpine Plants

Plants

exposed situations the balsam fir, white-bark pine and alpine larch frequently become stunted, the main stem creeping with short erect shoots, sometimes giving rise to weird and contorted forms well named as elfin growth. The description given by Warming of elfin growth in the Western Alps and Pyrenees applies equally well to many places in the Rockies, although the species are different. The stems creep over the ground, descend slopes, strike root and send up strong bow-like branches and are often packed together so tightly that they will bear the heaviest loads of snow.

Obviously the limits of the various forest belts and the changes at timber line are determined by climatic factors of which three may be distinguished, temperature, wind and snow-fall. Low temperature as such, rarely plays any part in the altitudinal limit of subalpine trees. For instance, balsam poplar, which is confined to the valley bottoms in the Southern Rockies stretches as far north as the Mackenzie delta, the white spruce nearly to the shore of the Arctic Ocean and even the aspen has a similar northern limit. Curiously enough the trees which reach the highest altitudes do not pass as far north; the balsam fir only reaches the latitude of Dawson and Engelmann's spruce hardly so far. Evidently temperature alone is not the chief factor concerned.

Wind is always an important factor both in changing the natural habit of trees and also in limiting their growth, a feature well shown both at the sea coast and on the mountains. The tendency is to produce shrubby and even herbaceous growth, for the velocity of the wind increases as the distance from the ground increases. Frequently, actual forest line may be depressed at the head of the valley and extends upwards on the exposed shoulders. This can be well seen in many of the high level valleys of the Bourgeau Range, the difference in level of the forest line generally amounting to 600 feet. This suggests another factor than wind.

The depth of snow in the valleys is often great and in addition snowslides frequently sweep the valleys while the exposed shoulders are undisturbed. We must conclude that wind and snow are usually the two main factors tending to limit forest growth. Areas liable to movements of snow possess a distinctive type of vegetation. Two such types are common in the Rockies. The one is covered with a close mat of balsam fir not more than a foot or so high with the close-set branches overlapping like the slats of a roof. Over this, snow movements may take place with little injury to the trees, but erect shoots are broken off whenever snowslides take place. The other type is covered with dwarf willows a few inches high, their flexible stems being but little injured by the sliding snow. The autumn tints on these snow channels offer a striking contrast with the sombre green of the surrounding coniferous vegetation.

Great contrasts exist between forest line in the Eastern Rockies and the central mountains of Vancouver Island. In the Rockies the average forest line lies at 7,000 feet, but in the milder climate of the Pacific coast at the same latitude it is much lower, the average being about 5,300 feet. This is due to the greater prevalence of winds, the far greater depth of snowfall, the relatively cool summers and the greater amount of cloud, causing the snow to linger far longer into the summer. In the Eastern Rockies little snow is usually to be seen below 10,000 feet in August, while in Vancouver Island extensive snow beds and even small glaciers are found at 5,500 feet. The flowering season of the alpine plants is correspondingly later; in the Rockies most of the alpine vegetation is in fruit in the middle of August, while at lower elevations at the Pacific coast the height of the flowering season occurs in the middle or third week of August.

Beyond the region of isolated trees the vegetation consists chiefly of alpine plants, many having a circum-polar distribution. Such a familiar plant as Dryas octopetela occurs in arctic North America, Greenland, Iceland, Spitz-bergen, Arctic Asia, the Himalayas and the mountain ranges of Central and Northern Europe. It also occurs sparingly on some of the higher Scottish Mountains

and in one spot on Snowdon. The same distribution applies to Silene acaulis (purple moss campion). Sedum Bhodiola, Saxifraga cernua, S. Hirculus, Oxyria digyna, Polygonum viviparum, Arctostaphylos alpina and all these are common plants above forest line in the Rockies.

Although the flora is scanty at altitudes over 8,000 feet it shows considerable diversity and some of the associations covering large areas may comprise only a few species. The similarity of some of the associations with those found in far distant regions is often striking, thus the associations occurring on the plateau in Fig. 6 are identical with the vegetation in some regions in N.W. Iceland, and this similarity applies not only to the flora but to the general habit of the plants.

Life On And About Snow Fields And Glaciers

By Titus Ulke

It is commonly believed that there is no life among the so-called barren wastes of snow and ice such as are found in the Arctic or Antarctic regions or on the world's lofty mountain ranges. Some will associate such regions bordering the polar seas with white bears, walrus, seals, puffins and penguins, but few that are not initiated will go so far as to admit the possibility of numerous kinds of plants and animals living on and about glaciers or flourishing on and about cold, bleak-looking alpine snow fields. Yet such arctic or alpine-arctic regions actually are capable of and often do sustain a considerable population of plants and animals.

My interest in the subject-matter of this article was first aroused, years ago, while mountain climbing, upon observing certain kinds of plants growing through and even flowering below the snow crusts on some of the highest peaks of the Swiss and Austrian Alps and seeing the so-called "red snow" and abundant animal life on the snow fields and glaciers of Mt. Rainier, and on the glaciers of the Rockies of Montana and Canada.

By way of example, let us note what may be observed in a favoured locality, such as Mount Rainier. Upon ascending the shallow snow slopes of this mountain above Longmire Springs, even early in the season, one may notice, near the edges of the fir and spruce timber, the darkening of the otherwise resplendent white snow by countless millions of black or bluish-black springtails or podurids, which are little wingless jumping insects of the genus Isotoma and order Collembola, popularly known as "snow fleas."

Further up on the snow slopes, or along the edges of the numerous glaciers of this practically extinct volcano, considerable areas of the snow may be blood-red or pinkish in colour, which often appears as if actually bespattered with blood. This is the so-called "red snow," its colour being due to the presence of countless numbers of a tiny alga name Sphaerella nivalis. Now it is fascinating to note what weird notions have been, or still are current, as to its true nature. Some early explorers considered this alga a fungus, others stated that it was merely volcanic dust, some scientists described it as a rotifer or infusorian or crustacean, and still other observers believed that it was the real blood of departed saints. A very recent newspaper account of red snow in Estes Park, Colorado, described it as being half plant and half animal. It has received as many as eighteen different scientific names or synonyms, according to the belief held by each describer as to what its nature is.

An article containing an abstract of most of the literature relating to this interesting plant by the present author appeared in the Scientific American Supplement of May 19, 1917, pp. 316-317, from which article the following notes on red snow and descriptions of the ice-worms are chiefly

TYPICAL SNOW ANIMALS AND PLANTS

Fig 1

SNOW WORM. (Mesenchytraeus Gelidus)

NAT. SIZE

Fig. 2

SNOW FLEA OR SPRINGTAIL (Isotoma, Sp.)

'A' NAT. SIZE. 'B' ENLARGED *After Brues*

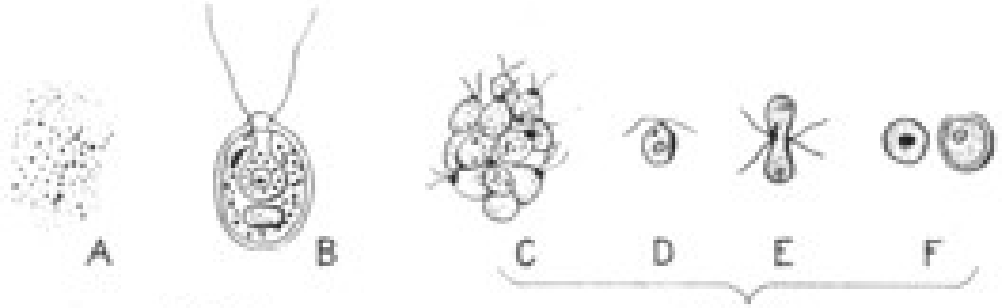


Fig 3

RED SNOW ALGA (Sphaerella Nivalis.)

A. NAT. SIZE, B. ENLARGED, C.D.E.F. YOUNG PLANTS.

1917 T. WILKE

taken: ‘’ The earliest mention of ‘ red snow’ of which I could find a record was by Francis Bauer, in a report made in 1820 to the Royal Society of London (Philos. Trans. Part 1, 1820, Pages 165-178) on the ‘red fungus’ which was found to colour the snow discovered extending over a range of cliffs in Baffin’s Bay by the polar expedition under Captains Ross and Kane in 1818. Bauer performed some experiments with the so-called ‘fungus’ and found that cultures of it remained colourless at the top of the original red sediment employed. He stated that the full-grown red fungus is a gelatinous mass, densely filled with spherical membraned cells, between 1/1600 and 1/1200 in size, and containing numerous red and green granules, and concluded that while excessive cold, such as 26° F. below freezing, and exposure to sharp air and wind, may kill the primitive fungi, the so-called seeds still retain sufficient vitality to vegetate and propagate, if immersed in snow, which appeared to be the natural soil of these peculiar fungi.

‘’In 1880 Prof. J. Brun reported to the Belgian Microscopic Society (Bulletin V. 1880, pp. 57-61) on a ‘Shower of blood which fell in the summer of 1878’ on the holy mountain of Djebel Sakra of the Atlas range in Morocco. The natives observed the red shower on the said mountain, which is an isolated mass of rocks, virtually bare of vegetation, rising to a height of 8,500 feet, and affirmed that it was the veritable blood of the saints which had once inhabited that locality. By employing strategy, owing to the superstition of the natives, Brun managed to visit the region, sacred to Islam, and collected specimens of the blood red material, which closely covered or spotted the rocks, shrubs, and lichens at about 7,500 feet elevation, for a space of many hundred acres. He reached the conclusion, after microscopic examination, that the red colour was due to a young and undeveloped Pleurococcus fluvialis mixed with organic debris and considerable very fine calcareous or alabaster-like sand. It was probably carried, Brun states, either from the snowy slopes of the Atlas Mountains or it consisted of mud from the dried-up brackish lakes to the southward, which had been observed to contain similar red algae, carried along by the dry winds from the southeast and precipitated by moist west winds proceeding from the Atlantic. Growth of the alga was at first given a tremendous stimulus by the heat and moisture and mud mixed with it, but was soon checked by the normal dryness of the arid environment. The natives stated that two similar downpours of ‘blood’ had been observed in the course of the previous decade.

“In 1881 R. B. Craft (Trans. Hertfordsh. Nat. Hist. Soc. 1881, pp. 170-172) noted that examinations of the ‘red snow,’ obtained in 1839 at Grimsel and in 1840 at the Aar Glacier of Switzerland, led Prof. Agassiz and others in 1841 to conclude that the coloration was due to immense numbers of moving animalcules and eggs of the rotifer Philodina, and Prof. Meyer in 1848 to remark that the cause of the red and green snow found on Spitzbergen was due to infusoria, namely, Euglena sanguinea and Euglena viridis. Craft also noted the occurrence of ‘red snow and ice’ in 1881 in Hertfordshire.

“Charles Hallock in 1886 in an article that appeared in the Amer. Monthly Micros, Jour. v. 7, 1886, pp. 42-43 stated that all the observations of naturalists point directly to the higher mountain slopes or glaciers as the birth-place of the plant from which the red deposits originate. In 1860 he and Prof. Elliott Coues, while cruising along the Labrador coast, in latitude 53°, saw a large gothic iceberg of opaque dead white, whose facade was crossed by a transverse vein of brilliant crimson, which colour was evidently caused by the same red deposit originally formed on the topmost stratum of the glacier from which the iceberg had broken loose.

‘’In 1881, M. Thoraude communicated a note on a supposed shower of blood which fell on December 13, 1887, at Tay-Ninh, in Cochin-China, to the Parish Academy. (Comp. Bed. v. 106, 1888, pp. 779-780.) While riding toward his home in a public conveyance together with

several fellow travellers at that time, he was suddenly accused by the angry young Malabar driver of having spread blood over his (the driver's) white linen clothes. It was immediately noticed, however, that similar drops of alleged blood covered the others' clothes, and that the heavens were darkened with dense humid clouds but that no rain fell. The natives recalled, with superstitious terror, previous showers of blood or 'water that was changed into blood.' As to the cause of the phenomena mentioned, Blanchard stated that Payen in 1836 attributed the red colouration to a minute crustacean branchiopod, to wit, Artemisia salina, which was probably transported, he thought, by wind and storm from the neighboring salt marshes.

"A really accurate description of the red snow alga, Sphaerella nivalis, finally is found in the American Botanist of 1912, v. 18, pp. 33-35. It is therein noted by S. B. Parish as a common alga in 1911 on the snow of the peaks above the Yosemite Valley, California, a phenomenon usually rare below the Arctic Circle and never before reported on this continent so far south in latitude. No other living organism appears to be able to endure such extremes of temperature as these algae. The 'red snow' plant certainly leads a hard life. It remains dormant during the long arctic winter, but the summer awakens it to activity. A consideration of the structure and methods of reproduction of this alga may well explain its marvellous capacity for multiplication and spreading over large areas of ice and snow with comparatively incredible rapidity. The alga is a free swimming cell with the cell membrane closely applied to the protoplast, at the anterior end of which two hair-like organs or cilia, for swimming and other purposes, and a red eye-spot are situated. It is characterized by the presence of a red pigment (haematochrome) in the cells. Reproduction is both asexual, by means of swarm spores, 2-8-16 of which are formed in a mother cell, and sexual, by conjugation of similar, small, biciliate gametes formed in large numbers (up to 64) in a mother cell, and uniting in pairs by their anterior ends to form a zygote. Thus the alga has several modes of multiplying its kind with great rapidity, and its transportation by wind and water and attachment to the feet of birds and other animals is facilitated by the long cilia with which each mature individual and each swarm spore is provided.

''Other data on 'red snow' may be found in the report of the Recherché Expedition by Kjellman in Spitzbergen, 1872-73, 'The Flora of the Snow and Ice,' 1883 by Wittrock, and on the occurrence of 'red snow' in the Antarctic by Bruce, Priestly and Charcot.

''Besides 'red snow' there are found in various parts of the world 'brown snow,' 'green snow,' and 'yellow snow,' each owing its colour to the presence of a different alga. Nor does this exhaust the richness of the snow flora, for over seventy species of plants, almost all of which are algae, grow in snow and ice.''

Associated, as a rule, with the red snow and snow fleas, on Mt. Rainier, are the remarkable ice and snow worms, described by Dr. P. S. Welch, Kansas State Agricultural College, in 1916, in a monograph entitled "Snow-field and Glacier Oligochaeta from Mt. Rainier," which paper is the chief source of the following observations:

"The snow and ice worms belong to the genus Mesenchytraeus, of which approximately sixty species and varieties are at present known in the world, and of which twenty-one species and three varieties are recorded from North America and are practically all confined to the Pacific slope. Five species and two varieties occur in California; at least two species are found in the State of Washington, while the balance, with one or two exceptions only, are restricted to the mainland and islands of Alaska and are not definitely known to occur elsewhere. However, only 3 or 4 species of ice and snow worms are definitely known to inhabit an environment of snow and ice continually.

‘’ Prof. Russell appears to have been the first to observe such worms on the snows of Mt. Rainier. Two species found there have thus far been described: Mesenchytraeus gelidus and Mesenchytraeus solifugus, var. rainierensis. Of the former, sexually mature specimens, yellowish to a dark reddish-brown or black in colour, about an inch long and 1/20 inch in diameter were found in February and April abundantly on the open snowfields of Mt. Rainier, at an elevation of from 2,700 to 5,600 feet above sea-level. They also occurred on the snow on the mountain slope in a dense forest of fir and hemlock. These worms have not thus far been found on solid ice nor on the glaciers, though they occur on the snow below the ice-front, and outside of the lateral moraines, of the Nisqually Glacier. The snow on which they were found is not permanent through the entire season, but melts with the coming of summer, and it therefore appears that a part of their life must be spent on or in the ground. During midwinter, when the temperature is very low, they are inactive and do not appear on the surface of the snow. Appearance at the surface accompanies the rising temperature in the spring, and their activity becomes noticeable when the snow is beginning to melt. When placed on hard packed snow during their active period, they are able to bore down through it at will. Under conditions of softening snow they exhibit a rather efficient locomotion. When taken in hand, they perform lively squirming movements for a time, but soon relax and become quiet. Bluejays and several other species of birds prey upon these worms, picking them off the surface of the snow. Nothing very definite is known concerning the food of these snow worms. Prof. J. B. Flett reports that the snow over which these enchytraeids crawl usually has a red colour, due to a minute unicellular plant which, in his opinion, serves as food for the worms. Dr. Welch found a considerable quantity of such microscopic algae, composed of very minute, globose cells, containing greenish and reddish pigments, occurring singly or in clusters, in the alimentary canal of these worms, thus leading to the conclusion that these snow algae constituted a large part of their food.

“Mesenchytraeus solifugus, var. rainier ensis, Welch, was found by Prof. Flett in June on the upper snowfields of Mt. Rainier, at an altitude of 7,500 feet. It is blackish in colour, but about half the size of gelidus. Worms of this variety occur on snowfields which seldom thaw during the summer, and they evidently pass their entire existence, generation after generation, in the snow and ice. There are reasons for believing that they may be found to live at an altitude as low as 6,000 feet. On the glaciers these worms coil up so as to appear as small spherical black masses or dots on the snow or solid ice, and it requires a considerable exposure to sunshine to warm them up to the active stage. The period of greatest activity, under normal conditions, is usually from the middle of the afternoon to about five or six o’clock.

In the same general habitat with the snow and ice worms, and often in the snow and fastened in the surface of the ice of the Nisqually and Paradise Glaciers, the writer, in 1916, found many species of insects and even several kinds of spiders. Some of the insects had probably been carried there by strong winds or warm air currents from the valley below, or crawled on to the ice from the rock ridges or so-called “cleavers” bordering the glaciers. Others, like many of the winged ants, evidently strayed there while on their nuptial flights, while still other kinds of insects, like one of the wingless grasshoppers, a meadow brown butterfly and certain flies and mosquitoes, seem—at least in the summer months—regularly to prefer these habitats.

Of the higher plants further up on Mt. Rainier, growing on morainal drift, or in sheltered rock crevices or in the pumice fields near the glaciers, may be found Lyall’s lupine, (Lupinus Lyallii) with its silvery leaves and numerous racemes of brilliant blue-purple flowers, Penstemon rupicola, with its rose-crimson flowers, the tiny lace fern, Cheilcmfhes gracillima, provided

against its inclement environment by a furry woolly covering, the lovely purple flowered silky Phacelia sericea, the skunk-like odoured Jacob's ladder (Polemonium elegans), bearing a cluster of blue flowers with yellow centres, the yellow mustard (Draba aureola), and finally the hoary white-flowered mustard (Smelowskia ovalis), which the writer found growing near Camp Misery on Mt. Rainier, at an elevation of over 12,000 feet. Two little meadow grasses, Poa lattermani and Suksdorfii, a small sedge, a Grimmia moss and two or three lichens compete for the highest honours, the last-mentioned plants even occurring at about 14,400 in the crater of the summit.

As Prof. J. B. Flett states, the season for all plants in these alpine regions is governed by the depth of the snow, or rather by the position and depth of the snow-drifts, which in turn depend on the varying winter conditions. In localities where but little snow has gathered, the plants spring forth early and often ripen their seeds, while about a deep snow-drift, which may not thaw for weeks, the plants may be buried and not flower until late in the season, and yet the autumn snow may bury them in full bloom.

High up on Mt. Ortler, in the Tyrolese Alps, one may observe the snow rose (Soldanella alpina) opening its lovely purple bell flowers in the immediate vicinity of the melting snow or even poking its pretty head through a foot or so of the snow cover in which it is said to be able to melt openings by its own warmth.

Ranunculus glacialis, a pretty rose-coloured crowfoot, is found on the very summit of the Finsteraarhorn in Switzerland, at an elevation of about 14,100 feet. According to Dr. K. Giesenhagen it grows the highest up of any flower in Europe.

Having now considered some of the chief plants, worms and insects which spend at least a portion of their life on the alpine or arctic snows or on glaciers, let us finally direct our attention to a few of the vertebrates normally found in such an environment. Strange as it may seem at first glance, the cold-blooded amphibians and reptiles are scarcely to be found, while members of the warm-blooded birds and mammals are often numerous. Evidently the latter are better equipped to meet the varying conditions of temperature than the amphibians and reptiles, which have neither feathers nor hair to retain air next to the body to serve as an insulator against loss of moisture by evaporation or of heat by radiation, which coverings enable birds and mammals to maintain a constant body temperature in spite of biting cold or extreme heat.

Among the mammals usually found in the arctic-alpine zone are the following: Mountain goat and sheep, which come down the mountain below this zone to feed at night, the goats, however, in winter, remaining chiefly on its wind-swept ridges; hoary marmots, alpine chipmunks, ground squirrels, conies, bears, porcupine and other small mammals, many of which eke out a scanty existence by feeding on the lichens, grasses, sedges, lily bulbs, mountain sorrel, alpine willows and other plants, bordering the ice and snow fields, or on the animal life living on or blown on to them.

Many animals, finally, will travel high up into the névé regions in order to escape their enemies, animal or insect. In this connection may be cited an interesting habit of caribou and mountain goat, not generally known, but observed by E. A. Preble and others, of travelling some distance from their feeding grounds, at times on to a snow field and then rolling in the deep snow to cool off and to get rid of annoying flies and mosquitoes.

Mountain Reconnaissance By Airplane

By A. 0. Wheeler And H. F. Lambart

Narrated by A. 0. Wheeler.

The permanent delineation of country and its various topographical features is made by map construction. Map construction is more or less crude, according to its amount of detail and finish. All maps are crude and unfinished as compared with the living terrain when seen from an airplane. As you float through the air with a gently swaying motion, you see spread out before you the work of that perfectly finished draughtsman, Nature; a map revealing the minutest detail and every conceivable shade of colour that is in use to express the handiwork of the Creator of our world.

Of particular interest to mountaineers is such a living map, when poised at several thousand feet above our Rocky Mountain areas; where the taller mountain tops are in the clouds; where deep, narrow valleys are in dense shadow and broad ones are streaked with brilliant sunshine; where great masses of snow are on all sides and ice-fields stretch far and wide, sending broken icefalls in every direction; where forests fill the valley bottoms and silver streams meander through them, showing glimpses of grassy spaces, and here and there lakes of all shades of blue, green and yellow like brilliant jewels. It is a living relief map spread out to the eye of the aerial observer, and as such puts the best efforts of the most skilful draftsman in the discard.

The survey of the boundary between the Provinces of Alberta and British Columbia had reached the Yellowhead Pass. Northward as far as Mt. Robson, 12,972 feet above sea level, I had made a preliminary map as far back as 1911, when exploring this region for the Alpine Club of Canada. Beyond, all was unknown areas of mountains, except to the hunter and trapper, whose knowledge was chiefly locked in his own breast. It is true that in 1914 an expedition was made by Mary L. Jobe, under the guidance of Donald Phillips. The result was a map published by Miss Jobe under the auspices of the American Geographical Society, Vol. XLVII., No. 7, July, 1915. It gives meagre detailed information except along the immediate line of travel, and wide blank spaces serve little to show the actual character of the country.

Through this terra incognita the Boundary Survey has to carry a topographical survey of the main watershed of the Rockies, which is the boundary between the provinces, and to construct maps showing where it lies.

The idea came from Mr. H. F. Lambart, D.L.S., who was in charge of a party sent out by the Geodetic Survey of Canada to collaborate with the Boundary Survey and supply fixed data on which to hang the topographical map. The Air Board was assisting Mr. Lambart, and he suggested to the British Columbia Commissioner of the Boundary Survey that probably assistance would be obtained from a reconnaissance of the unknown area. Application was made to the authorities and the superintendent of the High River Air Station was instructed to send up an airplane.

On July 12th the genial superintendent of Jasper National Park, Col. Maynard Rogers, accompanied by Mrs. Rogers, Mr. Lambart and the writer, motored to the landing place situated close to the Athabaska River, a mile and a half below Henry House on the Canadian National Railway, some ten miles from Jasper. Here is a patch of open prairie land, level and smooth as a board. A white tent was visible and two air machines.

The Government machine, a biplane, D.H. 4-B, with R.R. Eagle engine of 360 horse power, was in charge of Capt. J. H. Tudhope, of the High River Station, who was accompanied by a mechanician. The machine is a two-seater and the occupants are protected only by a narrow

Ready to Start. Photo, H.F. Lambart

No. 1

No. 2

Airplane Views By H.F. Lambart

No. 1 - Mt. Robson from the North

No. 2 - Looking down on Mt. Sir Alexander, showing sharp serrated top

windshield; a speaking tube enables a limited amount of conversation. The other machine was a privately-owned concern doing work for Jasper tourists while on its way to Hazelton to be used there for tourist and hunting parties.

I felt far more interested in the pilot of the Government plane, Capt. Tudhope, to whom I was at once introduced. A young man of great ability in his profession, he had served for a considerable period of the Great War. Quiet, forcible, active and keenly alert, he inspired the fullest confidence, and I felt very well satisfied to have the conduct of the exploration trip in his hands.

Colonel Rogers suggested a trial flight, to which I gladly assented, for, never before having been aloft, I had no idea what would be the conditions under which I should have to make my observations.

The morning of the 13th looked promising for a fine day, but soon the clouds came down over the tops of the mountains. However, it was to-day or not at all, so about 10 o'clock we rose into the air, and keeping well to the north of Jasper, flew up the Miette Valley. It was a revelation to me, the number of beautiful little lakes scattered about below. Jasper Park is truly an area of lakes. In a few minutes, travelling at a cruising speed of about seventy-five miles an hour, we were at the summit of Yellowhead Pass, and then, leaving the main valley, turned up the valley of the headwaters of the Miette River.

A voice in my ear: '' Hello! There's a camp down below us,'' and, looking down, I saw the white tents of my own survey camp, which had recently been moved to the spot. It lay in an open grassy valley and the horses could be seen lying around. The plane made a half circle about it to show it was duly noted and off again on our course. Proceeding northward we rapidly passed over a network of tilted rock masses, with very little open land showing in the valleys, and I soon saw that travel on the eastern side of the main divide would be difficult, if possible.

Turning westward, we were shortly over the valley of the Big Smoky River; and not far away rose the mighty mass of Mt. Robson, swathed in vapour, the great icefall of the Tumbling Glacier seen to fall directly from the clouds. We were flying at 6,000 feet and the clouds were not far above. Directly opposite was the square block mass of Mt. Bess, and to the right of it the snow-covered Mt. Chown.

Rounding Mt. Bess, we were soon over Wolverine Pass, and I recognized the glaciers falling from the ice-field below Mt. Longstaff. This was the end of my known country. We struck a N.N.W. course and followed the valley of Jack Pine River, passing over Meadow Lake Pass, Beaver Dam Pass and Avalanche Pass, and then we came to grief. There was a high ridge of mountains to be crossed, and the clouds were low over them. It was too dangerous to attempt crossing in the clouds, so of necessity it was a matter of beating around. This we tried to do, but got forced to the west, and eventually came out over a broad valley with a large river winding through it, and by its side the white roadbed of a railway. A voice in the speaking tube:

'' Good Lord! I believe we have struck the Athabaska River again."

A moment's consideration showed this to be impossible, so I replied: "No. It must be the Fraser."

Captain Tudhope turned the machine and tried to get on the proper course again, but the clouds were now lower and we were frequently passing through drifting masses.

It is an eerie sensation to be driving at seventy to eighty miles an hour through a dense cloud bank, knowing that sheer rock precipices are all around you, and not knowing whether you will break through the cloud belt in time. It was necessary to make a quick drop below the cloud belt. We swooped on a downward curve, the mist thinned and showed sheer rock walls all around.

We were in a pocket enclosed by rock masses and roofed by a cloud bank; the fact was emphasized by a jolting drop of the plane which added to the seriousness of the situation and made one think a bit. The thought was that between you and destruction was a thin piece of planking, and we did not know where we were except in a general way, which meant within fifty miles of anywhere. It was a queer sensation. I do not think it was one of fear. When one goes on a trip of that kind into the mountains on a cloudy day, one should be prepared for any event. It is more or less of a gamble when one cannot see landmarks that may be recognized, and when one is in and out of the clouds amidst mountain masses. You certainly become thoughtful of possibilities, and my real fear was that we should have to make a forced landing in some unknown and rough-bottomed valley, from which, if a landing were effected that left you alive and un-maimed, you would have to travel for days to reach some known landmark, such as the line of railway down the Fraser Valley. Subsequently the captain informed me that if no suitable landing place could be found the only thing to do was to "pancake," which, when more definitely explained, seemed to mean to the untutored mind to stop the engine and let her go until she dropped. I believe it means wrecking the machine but a chance of saving your life.

Sweeping out of the pocket, we followed the narrow, inhospitable valley of the West Branch of the Beaver River. The speaking tube again: "Hello! I am going to make a landing." "Can you find one?" "Yes, I'll find one." We had then been up two and three-quarter hours, and we had four hours gas, not enough left to go home.

And now the narrow valley opened on the broad one we had previously encountered, and there 6,000 feet below lay cropped fields and scattered houses, a larger collection of them showing a village. The railway wound down the valley and long red lines near the village, strings of freight cars, while the round house of a divisional point could be distinctly seen.

About a mile from the village a bright green field indicated a good landing place. The plane now swooped down in long spirals, the indicator rapidly sinking from 6,000 to 1,000 feet above the ground, now 500 feet, now 300 feet, now 100 feet. The captain flew across the green field, and finding it delectable, with a final swoop, skimmed the surface, the wheels touched, and we were rolling gently over a level field of well-grown timothy.

Almost immediately a broad-grinning inhabitant appeared, and small boys from everywhere. Inquiry told us that we had landed at McBride, 125 miles down the Fraser from our starting point. It was the first time an airplane had ever landed there. We could get lunch at the station, and, more important still, we could get gas.

Feeling well fed and happy out of the maze of mountains and clouds, we returned to the machine, where a goodly portion of the population was gathered. Taking on twelve gallons of gas, we returned to our Arctic clothing, climbed aboard, and made a rapid rise into the air amidst the cheers of the assembled crowd.

The distance back to the Henry House Landing was made at over a hundred miles an hour up the Fraser Valley. We passed Tête Jaune Cache and the C.N.R. branch to Kamloops, then by the mighty Mt. Robson, now clear of clouds, on a level with its crest. We were flying at 8,000 feet above the valley. Moose Lake, an eight-mile sheet of water, passed quickly by, and, shortly after, Yellowhead Lake and Pass.

The air in the valley was jolty, and the plane quivered and swayed like a sentient thing, which indeed it closely resembled. In what seemed a very short time, Jasper lay below us, then the white tent at the landing appeared, and the monoplane like a grey moth; a few quick spirals, the landscape rushing in on all sides, a tingling of the ears, and we glide gently along the ground to a

stop. The trip is over, and I have had the experience of a lifetime. To birds of passage like Captain Tudhope, an everyday incident had gone by. Somehow I felt older, and that I had experienced one of the biggest things in my life. I realized the relaxation of an unconscious strain which had left me with a feeling of physical exhaustion, and yet to fly is to want to fly again. The glorious exhilaration, the boundless spaces, and the feeling of superiority are magnets that will draw, and draw hard.

What of the results? As a means for mountain reconnaissance the airplane offers exceptional facilities. Given a clear day and the ability to keep to known landmarks, it is to a topographer a study of a living map, the most accurate that can possibly be had. I was enabled to get a clear conception of the country my future surveys would cover, and the nature of the access to them, and in one case was able to obtain information that will prevent a considerable loss of time. Nearly two-thirds of the desired ground was covered, and what I saw enabled me to secure a very fair estimate of the rest.

In conclusion I may say that the airplane service can be applied to distant and difficult survey work with great advantage, and I should think could be used as a means of saving expense. I Avould consider a hydroplane more serviceable owing to the numerous opportunities afforded by mountain lakes for landing, where it would be impossible for an ordinary plane to land in the rough and rocky valleys. The same applies to heavily forested areas where lakes are to be found.

Narrated by H. F. Lambart.

The Geodetic Survey of Canada, working in conjunction with the Provincial Boundary Surveys of British Columbia and Alberta, was given the opportunity of a very minute examination of the country lying to the north of the Canadian National Railway and the Yellowhead Pass, through the co-operation of the Air Board, who conducted a series of nights covering this country. Five nights in all were made, in each case carrying either Mr. Wheeler or myself. Two of the flights were made beyond the Mt. Robson district, on one of which I was fortunate enough to obtain proper weather conditions to make a flight through to the imaginary point where the 120 meridian intersects the continental divide, near Jarvis Pass.

This successful flight, made on the 16th of July, 1922, was from a natural flying field at Henry House (10 miles east of Jasper) and covered a distance of some 300 miles from Henry House to Jarvis Pass and back again in 3 1/2 hours.

In connection with the laying out of a triangulation net and assisting in the development of a topographical map, these flights have proved of great value. The operations afforded the unique opportunity of seeing three separate mountain groups distinct from their surroundings, higher and heavily glaciated, and of special interest to the alpinist seeking new fields.

The most distant of these is the Mt. Sir Alexander (Mackenzie) Group, situated near Jarvis Pass and consisting of two main peaks, the one just mentioned and Mt. Ida, both in the neighborhood of 10,000 to 11,000 feet of altitude, the former being much more conspicuous and perhaps a few hundred feet higher than the latter.

Mt. Sir Alexander will never be climbed. It is an absolute knife-edge of snow, not even corniced, along its full length. It is entirely surrounded by a high, level snow-field, the best approach to which is from the north. The only possible attempt at an ascent is on the east side. I have photographs looking straight down on the peak. It rises steeply like a wedge tent out of this elevated snow-field, which is definitely defined by steep walls of rock of almost horizontal stratification. These walls are more distinctly defined on the south side of the snow-field, and over them break glaciers flowing to the deep surrounding valleys of Black Bear Creek to the south and

another branch of the Big Salmon River, to the north. This northern fork of the Big Salmon River penetrates far into the range, with steep enclosing slopes, and is the course of the western drainage of Jarvis Pass, lying immediately to the north of the group. Mt. Ida lies, perhaps, six miles further to the east and north of Mt. Sir Alexander, and viewed from the southwest presents a profile not unlike Mt. Assiniboine with, however, a less pointed top—another Canadian Matterhorn. It is surrounded with glaciers, the upper névés appearing lower than the snow-field surrounding Mt. Sir Alexander. On examination of the photographs it can be seen that the summits of both these mountains would be difficult to make and particularly so in the case of Mt. Sir Alexander, of which the whole length of the serrated summit is a thin line of uncorniced snow.

The elevation of the machine while flying over the group was in the neighbourhood of 13,000 feet, and from this position in the air a very general and a splendid view of the whole of the surrounding country was obtained. To the north, the mountains are of a much lower relief and the long ridges seem to trend in an easterly direction from the main range and end in a wide, flat, timbered valley, swinging off to the northeast, into which also flow the eastern waters from Jarvis Pass. Jarvis Pass seems to consist of a long valley, the floor of which is made up of a series of lakes, or one large, elongated lake, probably four to six miles long, cut into by rounded points projecting from either side. The valley seems well timbered with spruce, with an entire absence of any hardwoods.

The descent from the snow-field surrounding Sir Alexander towards the north is gentle and the main glacier on this side in particular seems very placid and smooth, reaching the valley of a branch of the Big Salmon River by a long and wide, graceful sweep which commences in the snow-field at the northeast corner of Mt. Sir Alexander. The approaches to the group from the south seem easy enough through valleys timbered in the bottom and flanked by rocky ranges much eroded and rounded off. The group is fourteen days by pack train from the Mt. Robson station on the Canadian National Railway, the distance being, I think, somewhat less than 120 miles.

The Mt. Sir Alexander Group is separated from the Mts. Chown and Bess Group by a country distinctly lower and less rugged, the intervening gap being about 70 miles. The trail northward passes through this second group by way of the Bess and Jack Pine Passes. The latter group was first investigated by Dr. Norman Collie and A. L. Mumm, in 1910 and 1911, when Mt. Bess and other peaks were successfully climbed.

Mt. Chown—10,930 feet in altitude—the most conspicuous of the group, rises as an elongated cone covered by snow and ice, and protrudes from an immense snow-field which rises in a series of terraces to the upper reaches of a higher snow-field surrounding the final cone. This upper snow-field was traversed for six miles to make a station on a high, rock outcrop to the north of Mt. Chown. The edge of the snow-field was reached by ascending a rocky couloir from the valley of the Jack Pine River.

Mt. Chown would mean a long, hard walk over snow-fields separated at intervals by icefalls. Crevasses are numerous enough to make roping advisable. The entire snow-field is approximately 40 square miles in extent. A camp situated in Bess Pass would be the best location from which to climb the peak. A magnificent camp ground in a heavy grove of spruce bordering an open slope, kept clear of timber by the winter avalanches, situated between the Bess and Jack Pine summits would be the best location for an Alpine camp for those desiring to climb the other points of the group. It is a magnificent group, and the delicacy of the ice-chiselled rocks, with their innumerable waterfalls and magnificent Alpine flora, gives the whole area a characteristic charm all its own.

Thirty-five miles by trail separates this group from Mt. Robson Station by way of the

Smoky River, Robson Pass, Valley of the Thousand Falls and the Robson River.

Narrated by A. 0. Wheeler.

Reference has been made in the above to the pilot, Capt. J. H. Tudhope, who so skillfully carried out the flights for Messrs. Lambart and Wheeler under conditions at times adverse, and never free from danger should engine trouble or shortage of fuel force a landing, suitable or otherwise, in the mountain wilderness.

Mountaineers have often experienced the effects of electric clouds while on a mountain top. Not so frequently have electric storms—real lightning and thunder—been experienced when the climber was in the midst of the storm centre. The latter sometimes results in loss of life, or in severe electrical shocks. In view of such experiences the following incident which happened to Capt. Tudhope later in the same summer will be of interest. It is given as narrated by him:

"Flying from the High River Air Station on Forest Fire Patrol the following incident occurred:

"The machine in use was a single seater D.H.4, all the controls being in the back seat and having the front seat covered. I had just left the Forest Reserve, was flying at about 4,500 ft., and happened to be communicating to High River by means of the Radio Phone, the "Mouthpiece" or Microphone being strapped to my face."

"I noticed a rain cloud ahead of me but did not pay particular attention to it as it was small and I had passed through several while doing the Patrol; shortly afterwards I entered the cloud."

''I recollect feeling myself helpless soon after entering the cloud, the sensation felt was as if my head was being drawn back and all my muscles contracting; on regaining consciousness I felt sharp stings in my face and I immediately snatched the mouthpiece from my face and endeavoured to throw it overboard, but I was unable to do so as I could not open my fingers. My first thought was that I was getting shocks from my radio set till I remembered having gone into the rain cloud."

"I now became aware of the fact that my machine was out of control and that I was not very far from the ground. To regain control of the machine it was necessary to put up with the shocks which I got through touching the controls. A rough estimate of the height at which the machine was righted is about 300 ft., the height registered on my instrument was just on 100 ft.; however, the ground level is lower there than at High River, where my instrument was set at zero."

''Eyewitnesses at Rocky Mountain House have since informed me that shortly after the machine entered the rain-cloud a vivid flash of lightning was seen and soon after the machine was seen to be coming down in a very peculiar manner until they eventually believed it would hit the ground."

''For several days the effect of the severe shock which I must have received was felt, my arms, shoulders and neck being very sore and stiff; however, with the exception of slight burns on my face and my left hand no ill effect was noticed."

" To my knowledge there has only been one similar case recorded, but it is my belief that it has happened to pilots before and they were unfortunate in not 'coming to' before the machine has struck the ground, the usual unsatisfactory verdict, 'He must have fainted' being given by the Court of Enquiry."

Motion Of The Robson Glacier

By Arthur 0. Wheeler

The first measurements for advance or retreat of the ice-tongue of the Robson Glacier were made by the writer on August 10th, 1911, at the time of the Alpine Club Expedition. (See A.C.C. Jl. Vol. IV., 1912, pp. 44, 45.)

The next measurements were made by the writer on August 9th, 1913, during the Club's Camp of 1913. (See A.C.C. Jl. Vol. VI., 1914 and 1915, pp. 139, 140.)

August 7, 1922, measurements from the same marks were made by H. J. Lambart. The three sets of results are tabulated below :

As set forth in the above Journals the tongue of the glacier is divided into two separate lobes of ice by a rock nunatak.

The rock marked on the east side of the nunatak is a prominent square block of dark-blue crystalline limestone 14 1/2 feet by 7 feet by 7 feet high. In 1911 the main stream from the ice flowed to the east of it and immediately below it.

The rock was marked:

A.C.C.	To Ice
Aug. 10	338.6 feet
1911	

An arrow-head on the rock marks the point of measurement.

From this rock:

Distance to nearest ice in 1911—338.6 ft.
Distances to nearest ice in 1913—367.0 ft. Retreat 28.4 ft.
Distance to nearest ice in 1922—626.0 ft, Retreat 259.0 ft.
Total retreat—287.4 ft. Average yearly retreat—26.1 ft.

On the west side of the nunatak a vertical slab of blue, slaty limestone, forming its western wall, was marked in 1911. The slab shows striation and is quite smooth.

It was marked:
A.C.C. Aug. 10, 1911. To Ice 175 feet Along Wall.

An arrow-head on the rock marks the point of measurement.
From this point:
Distance to nearest ice in 1911—175 ft.
Distance to nearest ice in 1913—206 ft. Retreat-31 ft.
Distance to nearest ice in 1922—418 ft. Retreat—212 ft.
Total retreat—243 ft. Average yearly retreat—22.1 ft.

When the writer crossed Robson Pass on Sept. 9th, 1922, the entire flow from Robson Glacier was west to Berg Lake. It is likely that earlier in the season there had been some small flow east to Lake Adolphus.

MISCELLANEOUS SECTION

Fourteen Days In The Pyrenees

By Malcolm Bright.

". . . . There the torrents drive upward
Their rock-strangled hum;
There the avalanche thunders
The hoarse torrent dumb.
—I come, 0 ye mountains,
Ye torrents, I come."

—Matthew Arnold.

It was perhaps only fitting that our arrival at Luz-St-Sauveur in the French Pyrenees should be heralded by flashes of lightning and bursts of thunder, interspersed with downpours of rain. The mountains being what they are had seen fit to welcome us in bombastic style, although destined to bid us farewell in an infinitely more peaceful frame of mind.

On the evening of Friday, Sept. 16th, 1921, the little electric train, which runs between Lourdes (of pilgrimage fame) and Luz, and consisting of but one carriage, came to a standstill in the rain-blurred lights of the terminus station. Collecting ice-axe, rope, rucksack and other necessary impedimenta, I stepped out on to Pyrenean soil to be immediately welcomed by the two English ladies, who were to complete the trio that had come south for a fortnight's climbing.

A few minutes later over an excellent supper in the hotel we decided upon our immediate programme. We were to leave next morning on foot for the mountain village of Gavarnie, twenty kilometres further south, and situated at a height of 4,400 ft. in the centre of the Hautes-Pyrenees, occupying the best position whence to make the higher ascents.

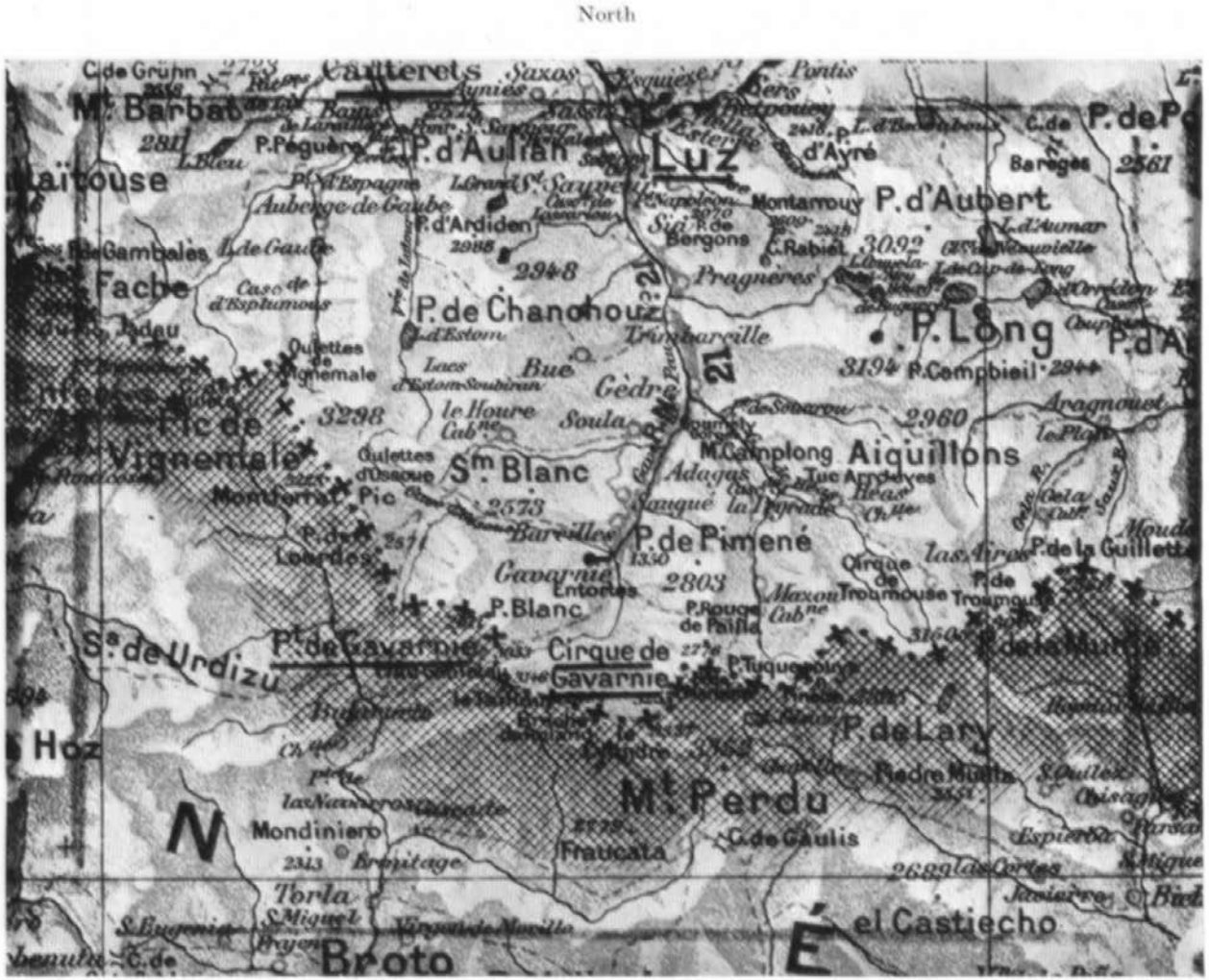
Next day, we moved out on to the Gavarnie road shortly after one. An early halt was made for lunch, on the sloping turf in front of a roadside cottage overlooking the Pont de Napoleon, after which we settled down seriously to the business in hand.

Behind, to the north, lay the valley with the plains of France fading from view. Ahead rose mountains as yet not much over seven or eight thousand feet. Below thundered the Gave de Pau, a mountain torrent which was to be our constant companion to Gavarnie, affording also excellent trout fishing.

The twelve miles ever up-hill along the hard highroad reminded one of the walk out from the station to the A.C.C. summer camp, which always used to seem the most tiring part of all. It was only after we had been on the road some hours that the heel of the "General's"[30] boot threatened to come off, necessitating temporary repair with the aid of some string obtained at a wayside peasant's abode.

Shortly before reaching the village of Gedre, which marked twelve of the twenty kilometres accomplished, we had our first glimpse of snow. It proved to be the Glacier du Taillon, leading up to the famous Breche de Roland (2,804 metres). According to tradition, Roland, when returning from Spain in the rear of Charlemagne's army, struck the impassible barrier of rock with his sword and so cleft a narrow opening back to France. There it was, plainly visible to all, the high narrow

30 The nickname given to the elder of the two ladies.



Map to Illustrate the Article
Franco-Spanish Frontier Shown +++

slit, like a perpendicular slice out of the mountain, showing up most strikingly against the skyline. The sight of one of our much read-about friends appearing so near put fresh life into tired limbs, and we entered a few minutes later the village of Gedre.

Here we partook of an excellent bowl of cafe au lait (not to say two) before continuing on the last lap of eight kilometres. To the "General" mountains were no new sight, she having in days gone by made some first-class ascents in Switzerland. But for her younger namesake, the "Debutante, '' who was seeing and entering amongst them for the first time, what terrors and nerve-shattering experiences were in store! As yet, such terms as crevasse, arête, bergschrund, and the like had no meaning for her. Their full and awful significance was to dawn later.

With a distinct nagging in our footsteps we pushed on, and with the failing light came upon the first houses of Gavernie. A group of men were chatting on a raised terrace, fenced in with a railing. They leant forward and watched us as we crawled slowly onwards. One called out, enquiring whether we needed a guide, to which the "Debutante" made answer, not wholly, I think, comprehending the purport of his meaning, that we were too tired.

We reached the bridge over the Gave de Pau as dusk set in, just in time to see the statue, built in the rock, of Count Russell, that eccentric Englishman, who was the explorer of the Pyrenees. A couple of minutes later we were in the Hotel des Voyageurs, where our baggage had already arrived, having been sent on in advance by carriage.

The next morning, Sunday, was a cloudless day, the forenoon being spent by two members of the party in attending Mass at the little old village church, which dates back to Saracen times. In the afternoon, the trio decided to walk out to see the celebrated Cirque de Gavarnie, a semi-circle of mountains rising to 10,600 ft. in the Pic de Marbore, and measuring nine miles in extent. This Cirque virtually constitutes the boundary between France and Spain, shutting off Gavarnie from the south. All day long throughout the summer a continuous stream of tourists on foot and muleback may be seen wending their way to the Cirque, distant one hour from the village. We passed an agreeable afternoon, the main outcome of which resulted in sharpened appetites for food and mountains.

The following day, Monday, was clearly going to turn into a '' drencher'' at no very remote period; but on the pretext of a little stroll, though inwardly with sanguine hopes of getting on to the famed Vignemale (10,800 ft.), the highest mountain in the French Pyrenees, the three of us set out along the Val d'Ossue, which runs westwards from Gavarnie to a little short of the base of the Vignemale. But we had not gone far ere the rain descended in no uncertain manner. We pushed on, however, in the wet, until chancing to meet a shepherd driving his sheep we took his advice and sheltered in a near-by low log hut. Not the least pleasant part of that morning was to see the bond of friendship existing between shepherd and sheep, as the latter nuzzled in his hands.

Inside the hut we ate our sandwiches and bumped our heads against the roof, until the rain had stopped when we squelched our way home. Throughout the whole day the clouds remained down, obscuring any glimpse of the Vignemale. But the walk, if it did no other good, at least toughened us up.

Our objective on the next day, Tuesday, was the ascent of the Breche de Roland, which lies to the west of the Cirque de Gavarnie, though part of that chain. An hour and a half saw us at the base of the Cirque, where we found ourselves confronted by a huge semi-circular wall of rock, down which fell two or three waterfalls, one of which for sheer height beats anything, I think, to be found in the Rockies.

In the west corner, and to the west of the last waterfall, there is a narrow passage way

View From Hotel At Gavarnie Looking Toward Pic De Marbore.

mounting obliquely across the face of the rock, known as the "Echelle des Sarradets." To those accustomed to climbing it is nothing unusual, but to a beginner with not too good a head, it is a veritable nightmare with its perpendicular drop, if you peer over the edge, to the scree below. It took a deal of persuading before the "Debutante" could be induced to venture upwards. Unfortunately, the worst part came at the beginning. However, at long last we reached the top, but through bad guiding on my part failed to bear sufficiently to the south keeping on instead in a westerly direction. The result of this was an unnecessary scramble over the shoulder of a low peak, and a long detour to bring us back to the rock terrace leading to the base of the snow slope beneath the Breche.

On rounding a bend of what must have been in some bygone age the bed of a glacier, the goal to which we were heading burst into view almost, it seemed, within hand reach. But the game was not yet won.

A wretched mount of very fine scree confronted us; at so steep an angle did this lie that the mere placing of one's foot upon it caused the miserable slate-coloured stone to avalanche. This part of the climb was so exhausting that the rope had eventually to be put on the '' Debutante'' and in this manner she was hauled up to the top. Here we were faced by the final snow slope, which being more vertical than horizontal and in a hard condition necessitated the putting on of the rope and step-cutting.

It was whilst on this that I had occasion to take off my rucksack and put it down. Instantly the loaf of bread, which was to comprise the greater part of our lunch, shot out and went bounding down over the snow and scree into the valley below. We watched it go with feelings of anger and regret at my unpardonable lack of precaution.

Having been more accustomed to have steps cut for me than to cut them myself, I most consistently over-estimated the length of the ladies' stride, or rather the width of their skirts. (In later climbs these were dropped and the excellent example of the A.C.C. followed.) Suffice it to say that at an hour when we should have made the ascent and reached the hotel again, we arrived at the Breche, and sheltered from the icy wind that was blowing in the little "refuge" at the southwest side of the gap. There we ate our chicken (without bread, alas!) and drank our wine, gazed at Spain lying at our feet to the south, looked at our watches and realising the lateness of the hour put on the rope and started the descent. But Ave had not gone far before trouble overtook us.

"We were at the time negotiating my unpleasantly wide steps and after having proceeded for some distance, allowing only one to move at a time. I was myself in the act of stepping down when the "General" moved also, slipped, and in less time than it takes me to record it, went shooting down the slope dragging the "Debutante" after her, and despite my efforts at anchoring pulled me out of my steps. As bad luck would have it, I lost hold of my ice-axe, which went off like "greased lightning" and reached the rocks before any of us. "With the exception of several scratches on the hands, which nevertheless took a long time to heal, no one was, luckily, any the worse on arrival at the scree; but it had given us a good shaking up and reminded us of the old rule, which was not quickly forgotten, that one moving at a time is the only possible arrangement on steep slopes.

All now went smoothly until it was announced that the "Echelle" had again to be faced. In vain the "Debutante" pleaded for some other route to be taken. There was no alternative but to descend by that narrow, steep passage. And so, manipulated it was in the gathering twilight.

We now found to our dismay that the three streams, which we had crossed in the morning had swollen to such an extent, owing to the rain of the previous day, that we should not be able to cross without considerable difficulty.

A youth with a couple of mules was noticed on the further side of a glacial torrent. After a

mad rush down the steep scree, which was intermixed with boulders, at imminent risk of spraining an ankle, his assistance was solicited; but for some reason which the thunder of the torrents rendered impossible to hear, he seemed indisposed to give it. Shouting something about sending help from the small hotel situated at the entrance to the Cirque, he left us and we, making the best we could of a bad job, pushed on and successfully jumped the torrent twice in what was now practically darkness.

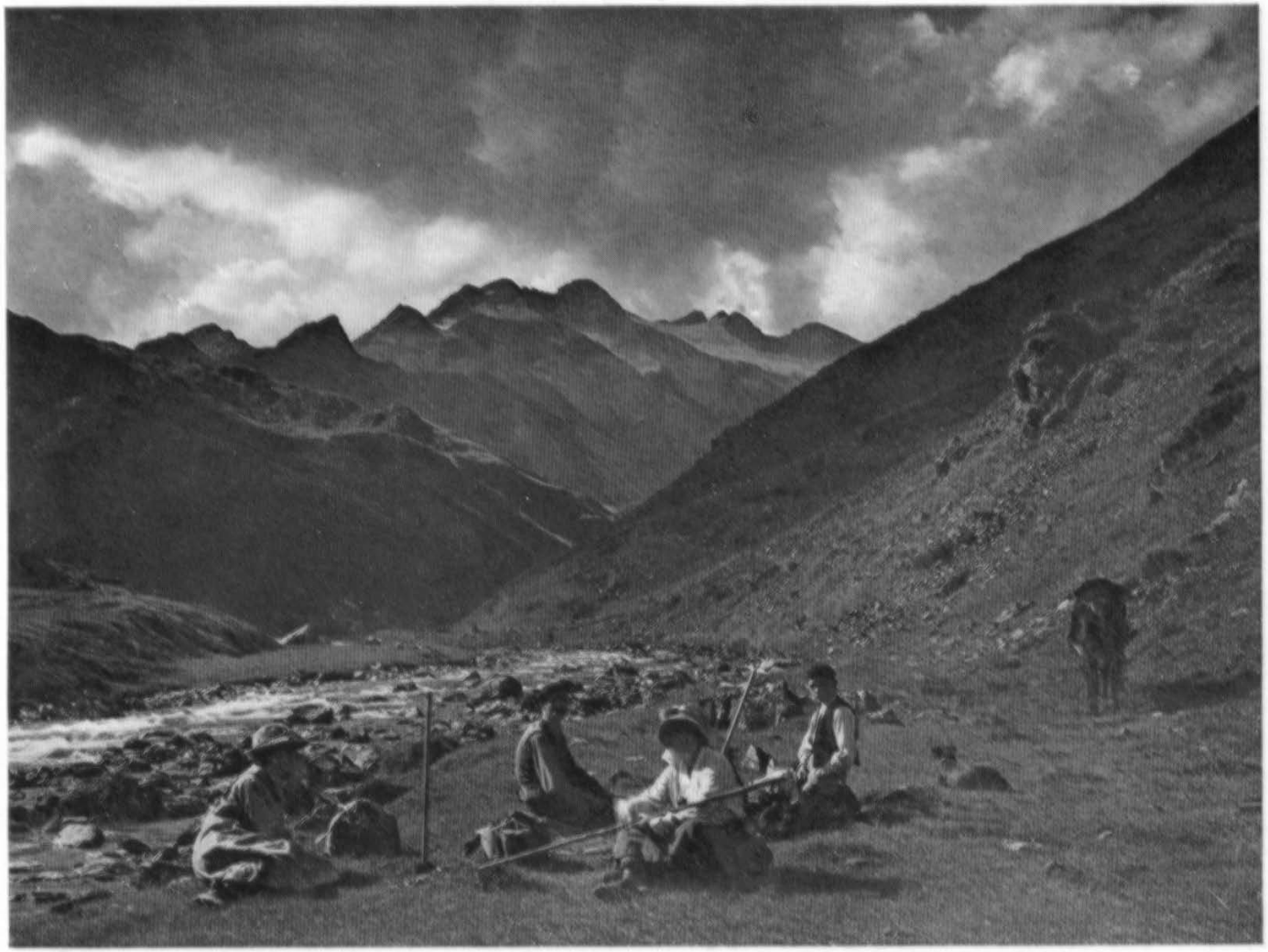
It was now that a new difficulty confronted us: the "Debutante" proved to be night-blind. Not a step could she see. At last, tired out and having had more than our fill of work for the first day's climb, we thought we detected through the noise of rushing waters the sound of voices ahead. At once I began striking sparks on the rocks with my ice-axe. A shout from ahead and our whereabouts had been revealed. A minute later two stalwart fellows— one French, the other Spanish—presented themselves. They were employees of the near-by hotel and had come at the request of our friend, the mule-driver. The "Debutante" and the "General" were taken in tow and in this fashion we reached the hostel at the entrance to the Cirque. Here we sat down to coffee whilst waiting for three donkeys to be got ready, for we were too done to continue on foot and moreover rain had started to fall. At about 9 p.m. we again set off, our two "rescuers," armed with sticks and lanterns, leading the donkeys. How surefooted are those extraordinary animals! Time and again in the inky blackness (for the lanterns soon expired) those patient beasts would turn and twist left and right to avoid boulders, which their unerring instinct warned them of, but which we failed utterly to see. At last, half asleep and dripping wet, we saw the lights of the Hotel des Voyageurs loom up before us. Great was the joy, but bitter the scolding that I received from M. Vergez-Bellou, the proprietor. Monsieur had no right to undertake with ladies and without guides what was invariably looked on as a professional guide's task. Monsieur might have been lost, and in that uninhabited region might have died before help was forthcoming. In vain Monsieur mentioned that he had climbed in Canada, Switzerland, and Spain; to no purpose, he had been "très méchant» and had given his friend the proprietor an evening full of anxiety. To those who know Zermatt I can best describe M. Vergez-Bellou as being the Alexandre Seiller of the Pyrenees. Pull of kindness, with an ever-watchful eye for the welfare of his guests, no amount of trouble was too much for him. Being there as we were from the middle to end of September when the Hotel was practically empty, we received perhaps more than our proper share. But not the least delightful part of our stay was the beaming face full of welcome which met us always at the end of the day's work on our return from an expedition.

The next two days were spent in fishing and picnics, and in making arrangements for setting off on the Friday, with the guide, Francois Trescazes, who is incidentally the local bootmaker, for the Vignemale, the highest mountain in the French Pyrenees (10,820 ft).

We got away at 1 p.m., this being only achieved by impressing upon the ladies the absolute necessity of our leaving not later than 11 a.m. A donkey was brought along for the ‘’ General," for are not officers of this rank always mounted ?

Again we walked along the south bank of the Gave d 'Ossue. But what a difference! The first time it had been drenching with rain, now the blue sky flecked with clouds crowned all, whilst a brilliant sun, all the more wonderful for its long absence, beamed encouragingly down upon us. But it was not to last, for storm clouds soon gathered upon our host of the morrow.

At last, after crossing the Gave several times, we reached a bend in the valley whence we obtained our first view of the Vignemale—Count Russell's own property. In order to carry out certain experiments, as I understand, he obtained a peppercorn lease of the mountain from the



The Montferrat And Vignemale Gave D'ossue In Foreground.

French Government for ninety nine years at the nominal sum of one franc per year.

Soon after this the mule was sent back (4:45 p.m.) and the upward climb started to the Refuge du Vignemale, where we were to sleep the night. Some twenty minutes before reaching the Refuge (7:15 p.m.) three of Count Russell's famous grottoes were passed. These consist of regular cells blasted out of the sold rock, some ten feet or so square, capable of sheltering parties for the night. How many of these shelters there are in all I am unable to say, but there is certainly one, which I saw for myself, constructed on the final peak some ten minutes below the summit at a height of 10,600 feet above sea level. It would be interesting to know if Switzerland can produce anything to touch that, and although by no means certain, I think I am safe in saying that this shelter stands at the highest altitude of any in Europe. But Count Russell is dead and so far as could be ascertained no one now uses his "residences. ' '

It was dark when we reached the Refuge—a spacious affair capable of sleeping eighteen persons and stabling six horses. It was constructed by the C.A.F. (French Alpine Club) and like all their huts is solidly built, with a sharply-rounded roof, and for protection against the weather is tarred all over. The sleeping accommodation is reached by an almost perpendicular iron ladder from the general feeding room, and is divided into two parts for men and women. When we entered a gay throng presented itself to our eyes. Some six or eight workmen were engaged in carrying out repairs on the hut, and the cheerful noise of their raucous voices full of good humour, together with the sizzling sound of meat frying on the fire, produced an air of jollity and homeliness about the place difficult adequately to describe. The two most interesting characters in the room were a local guide in a wonderful blue coat with large coster-monger-like pearl buttons and his charge, an old French lady of near on seventy years of age. Before the War whenever she wished to travel between Cauterets, a village in another valley, and Gavarnie, she chose to pass the night at the "Refuge" and always in the care of this same guide. Had money been the chief incentive he could have made far more, as he pointed out to me, by catering for the "tourist" trade since he was a first-class guide. But for some inexpressibly pleasant reason he invariably attended upon the old lady himself.

On the outbreak of War he was called up. His former charge adopted him on that excellent French scheme so thoroughly popular throughout France during the War, as her soldier "Godson." Like the good marraine that she was, from time to time as her scanty means allowed she would send him parcels of food. On meeting any of his brother poilus she would anxiously enquire for news of him. Was he well? Had he received her parcels? And here he was after the war back at his old post again, leading her on. muleback along a well-defined path, a task which the veriest lad could have undertaken. Yet she would have no one but him. He laughed in recounting this, and jerked his head occasionally in the direction of the old lady, who sat chatting with our party. Nevertheless, beneath the surface I could see he was proud and fond of his charge, and I doubt not but that it would have fared ill with any other who might have tried to wrest his position from him.

With that courtesy characteristic of the French, an adjoining room, which had previously been taken by some of the men, was evacuated and placed at our disposal. It possessed three beds on which, fully dressed save for boots, we endeavoured to make ourselves comfortable and fall asleep.

The next morning, Saturday, we were called by the faithful Trescazes at 4:30. He was very gloomy. The clouds were all down, he said, and for the present there could be no talk of starting. Not satisfied with his account I got up myself and went out. It was, however, only too true. Heavy, cold mist hung over everything and one could scarcely see a dozen yards. It reminded me of an

early morning in Switzerland during the winter sports before the sun has risen and with its radiant warmth dispelled the morbid fog. Hoping that the same thing might prove the case to-day I went back to bed and waited. Every half hour I got up to look, every half hour saw me forced back to bed again.

At last at 7 a.m. the mist showed signs of clearing. But the guides were unanimous that it was going to continue cloudy throughout the day, and clouds on a glacier, as the reader knows, means no climb.

The old lady and her faithful guide set off and his last words were to the effect that we should not see the summit of the Vignemale that day. I refused to be daunted, and as I could see the round disk of the sun through the now filmy mist, I used all my persuasive powers to win over Trescazes to see eye to eye with me. For a while he kicked against the pricks but finally gave in, when the clouds had lifted sufficiently to show us the near-by glacier, stipulating that neither of the ladies should come, as there was some sensational rock work of a variety not calculated to please the '' Debutante.'' Further, as we were excessively late in starting, the climb would have to be '' taken on top gear,'' a thing that cannot advantageously be performed with a party of four, of whom two are ladies.

At 8 a.m., when we left, Treseazes saddled with rope and I with quarter-plate stand camera and tripod lashed on to the ruck-sack. We skirted the boulders at the base of the glacier and quickly mounted the rocks which lead to the "arête" on the Montferrat, the mountain to the east of the Vignemale. By this time the sun was fully out and the mist in general retreat.

Narrower and narrower grew the arête until at length we reached the mauvais pas referred to by Mr. Harold Spender in his book on the Pyrenees. Treseazes offered to put on the rope, but feeling quite happy without I declined. We now left the arête and very gingerly crept out on to the nearly perpendicular western face of the mountain. Beneath lay the glacier with a jolly bergschrund waiting to engulf one should a slip occur. For a few minutes the position was ''interesting'' and mildly sensational. But it was manipulated without difficulty and at 9:15 we were at the southeast corner of the glacier. We now worked upwards and across in a northwest direction towards the middle and highest of the Vignemale's three peaks. The snow was in excellent condition, howbeit care had to be exercised in traversing a melting knife-edge of snow between two crevasses. At 10:10 we reached the base of the final peak and after twenty minutes of steep upward climbing over red slate gained the summit and stood upon the highest point in the French Pyrenees. The normal time taken from the Refuge to the summit of the Pic Longue, the highest of the Vignemale's several peaks, is from four to four and a half hours. Nevertheless, we succeeded in making our bow from the summit to the ladies watching below at 10.30 a.m., exactly two and one-half hours after starting. The view was superb. Banks of white clouds drifted aimlessly about, as though uncertain whither to go. To the southeast rose the partly-shrouded peak of Mt. Perdu (11,180 ft.), fringed with a background of fluffy white, and a filmy wisp playing about its summit.

Mt. Perdu, or to give it its Spanish name Monte Perdido, since it lies in Spain, is the second highest of all the Pyrenean peaks. Four days later we were to stand upon its summit, this time with both ladies strongly to the fore. Unfortunately, the highest peak of all, the Pic de Néthou in the Maladetta range was obscured from view by clouds.

Finally, after taking various photographs, eating a snack, and drinking each other's health in "Izarra" (an ancient Basque liqueur) and signalling to the ladies who were cooeeing from below, we left at 11:45, were off the glacier at 12:10 and joined them at Count Russell's three grottoes at 1:30. The donkey met us as pre-arranged at the head of the valley, and we entered Gavarnie

somewhat fatigued but victorious, with the ever-smiling face of M. Vergez-Bellou to welcome us at a little after 7 p.m.

The next day, Sunday, peace reigned in room No. 11 until a late hour of the morning. In the afternoon we went fishing, during which I missed a fine fellow, who took exception to the sudden movement of my fly as I turned at a shout from the '' General,'' who had succeeded in hooking another. Great was the pride we all felt in her achievement when unaided she landed her fish, a small half-pounder, if I recollect rightly.

Arrangements were completed on this day for the setting off of the party on the following morning for Mt. Perdu. As the ladies had been baulked of their legitimate pleasure on the Vignemale it was decided that this trip should be the veritable piece de resistance by making a three-day trip of it, in the following manner.

The first day we were to reach the Refuge de Tuque-rouye, where the night was to be spent; the second day to make the ascent of Mt. Perdu and drop down into the Spanish valley of Ordesa, continuing westwards to the little place of that name with its two wayside inns, where we were to sleep; and the third day pursue our course via the villages of Torla and Bujaruelo, sweeping northwards by the Port de Gavarnie, which is the Franco-Spanish frontier, back to Gavarnie again. This would take us up to the Wednesday and the following day would witness our departure en route for England.

Away we went then at 11 a.m., this time with two guides and a dog, following the path for the Cirque. Presently we left this and struck up to the southeast towards the Breche d'Allanz, the gap in the ridge which gives access to the next valley eastwards. Once through this we bore sharply southeast and after a further hour or so along a path through scree turned again south and started the ascent of a steep couloir. At the top of this in a little cleft in the otherwise unbroken rock lies the Refuge de Tuquerouye. This is another of the C.A.F. huts, but far smaller and less comfortable than that on the Vignemale.

As we rounded the corner of the Refuge at 6 p.m. there met our astonished gaze the first view we had had of the imposing figure of Mt. Perdu. The dying sunlight was playing upon the small white crown of snow, like some monk's skull cap, that formed the final approach to the summit.

A photograph was obtained and in the hope of getting another by moonlight the camera was weighted and the tripod legs fixed firmly with rocks, for fear of wind in the night.

A few minutes later a shout recalled the attention of the rest of the party, and as we looked towards the setting sun an exclamation of astonishment and admiration broke from us. Of all conceivable sunsets it was the finest. Every shade of colour was there from blood red to the palest tinge of pinky mauve. Very gradually whilst we watched it became fainter and fainter, until at length it died away into the oncoming night.

We then retired within the cabane to eat the evening meal. A few clouds drifted up, but these cleared away later, revealing a perfect evening. When next we came out to look the heavens were scintillating with brightly twinkling stars, and our host of the morrow loomed up like some colossal seated statue with his glacier spread out like a napkin upon his knees.

Within the hut the merry chatter of contented mortals after a good meal betokened high spirits for the next day's work. Quite in keeping with our good humour we asked the guides for some Pyrenean folk songs. But they declined through shyness, leaving us to lead the way. We sang on far into the night, in fact the guides were half asleep when we finally subsided. Three times during the night I got out to try an exposure of the mountain, but the moon refused to oblige, and

the attempt had to be finally abandoned.

At 5 a.m. we disentangled ourselves from the hay and began to prepare for the coming fray. By 6:30 we had started. Dropping down to the Lac Glace lying at our feet and skirting it to the eastwards we crossed round behind it westwards again and began the ascent proper. An easy face of rock followed by a fleeting passage across the west comer of the glacier brought us to a tiresome scree slope culminating in the col between Mt. Perdu and Le Cylindre. This last is to the west of and slightly lower than the former. From here we dropped down to another Lac Glace (10 a.m.) where we had a snack before starting upwards once more over a mild patch of snow with a substratum of ice, followed by rocks to the summit which was reached at 11:45 a.m.

The "Debutante" had climbed her first mountain, no mean affair either, of 11,180 ft., requiring distinctly more nerve and effort than is needed for the average "graduating" climb in the Rockies. But as is so often the case in climbing the worst was yet to come.

The day was magnificent, with no clouds in sight, save in the distance where they hid the Maladetta range from view. This is the massif which boasts in the Pic d'Aneto (3,404 metres—11,400 ft.) likewise in Spain, the highest peak in the Pyrenees.

After taking numerous photos, entering our names in the register and drinking the special liqueur, mentioned above, to the health of Mt. Perdu and ourselves, we left at 12:15 and stopping at the Lac Glace for lunch continued on down the south side of the mountain. The going was very tiring, being composed of an enlarged form of scree which played havoc with one's boots, and rattled the life out of one's feet within.

At last we reached a spot known as the Echelle de Gaulis. The '' Debutante'' took one look at it and then sat down. It was certainly something for a beginner to sit-down over. We had arrived at a spot where the ground suddenly vanished before us in a perpendicular wall of rock. In the face at convenient intervals iron stakes had been fixed to make reasonably pleasant an otherwise ticklish proposition. Brandy and sugar had to be resorted to in order to stimulate the "Debutante" to the required pitch. Even then the rope had to be put on her, held six feet away by the guide, and thus we reached the bottom.

We now had a simple, straight-forward task before us. We had but to follow a footpath alongside a pleasant trout stream. As the ploughman, in Gray's Elegy, who "homeward plods his weary way,'' so likewise did we pursue our course through the Val de Ordesa to the two wayside hostels that together with another farmhouse constitute the hamlet of that name.

Once we stopped, took off boots and stockings and soaked tired feet in the refreshingly cold water of the stream. But we were late and far behind our scheduled time. So there was nothing for it but to continue in the ever-lengthening shadows of the woods. The "Debutante's" night blindness necessitated one or other of us holding her arm for fear of a bad fall over the rocks.

Not until eight o'clock did we reach the two inns of Ordesa. There was not a light to be seen. Both had the appearance of being deserted. No sound save that of the babbling stream broke the stillness of that never-to-be-forgotten night. We walked up to each house and tried the doors. They were locked, and the window shutters barred. The guide turned to me and in a few words the unpleasant truth was told, that owing to the bad weather of the previous week both hotels had obviously closed down for the season a fortnight earlier than was their wont.

We sat down at one of the canopied tables, used in fine weather as an outdoor dining room to discuss what was to be done. To go on to Torla, an old Spanish village, would take a further two to three hours. Already the "Debutante" was showing signs of fatigue, having been on the move since 5 a.m. that morning. At the same time it was equally clear that we could not spend the night

in the open. Besides, our stock of food was nearly exhausted, so sandwiched between Scylla and Charybdis we decided to face the lesser of the two evils and continue on in the darkness to Torla.

Never will that night be forgotten! Up and down, and in and out wound the rough path, now near to the stream and in the open, now high above it and through pitch black pine woods. And ever the "Debutante" had to be guided by a friendly but tired arm.

There comes a degree of fatigue when one ceases to care what happens, when one's feet and legs function in a purely mechanical fashion. More than one of us reached this state within no great time of leaving Ordesa.

On and on we trudged and stumbled, intent only on reaching Torla, where we could sleep—sleep for evermore. But no Torla showed up. Not a glimmer of any description broke the blackness of the night.

Every half-hour or so we sat down for a few minutes' rest, and then continued on the path with weary limbs. Overhead not a star shone out to look with pity on five belated travellers. Nothing but the gloom and the sound of the stream near at hand. Nine o'clock came and went, half-past, ten, half-past ten, and then at last far away we saw one solitary light shining. It was Torla.

But even then it took us another hour to reach it, and it was half-past eleven as we stumbled across the bridge spanning the stream and slowly moved up the steep old cobbled street leading into the village.

We knocked at the door of a little Spanish "Fonda" (country inn) and I, as the only Spanish-speaking member of the party, pleaded in eloquent Castilian with the good woman to let us have food and rooms for the night. And now mark the courtesy of the Spanish peasantry. The good woman got up and dressed, roused her son, made us as comfortable as she could, whilst the fire in the kitchen, which in a Spanish household consists of charcoal fanned into flames by hand, was re-kindled, and after a somewhat lengthy wait a meal fit for the gods on Mt. Olympus was spread before us.

The next morning I breakfasted alone on that splendidly-made Spanish dish tortilla, for the Spaniards, like the Italians, are past masters at omelette-making. There was no stirring in the ladies' room until far into the morning, and even at lunch it was a tired party that sat down to eat of arroz, that popular course consisting of boiled rice with meat, vegetables, mussels, and various shell fish cooked in their shells, all in one glorified jumble.

In the afternoon we sauntered down to the stream, there to picnic and fish with hopelessly inadequate gear for the nobly-proportioned trout that abound in this and many of the Pyrenean streams.

But that peaceful day passed all too quickly, and on the morrow we again set foot, this time with a couple of donkeys for the ladies, to complete our round journey back to Gavarnie.

We made a stop at the village of Bujaruelo, which possesses an ancient chapel, part of which had been turned into a granary.

From this point the path climbed steeply in a northerly direction. We were soon to leave Spanish territory and re-enter France at the Port de Gavarnie. This was reached in time for a most enjoyable picnic lunch. Here the donkeys were despatched homewards again, and we, skirting the west flank of the Pic de Gabiéton (the westernmost of all the peaks in the Cirque de Gavarnie) descended by a pleasant path new to us and further north than the much-dreaded Echelle des Sarradets, reaching the hotel a little before supper time.

And so ended our last climb for the season. After supper the guides came in to present their account over coffee and liqueurs. François had taken a great fancy to some trout flies, brought out

by us, and these were accordingly exchanged in part payment of the bill. The customary eulogy was inscribed in their books, though I never wrote two with more sincere pleasure, for they were both excellent fellows. Notwithstanding, one of them should have retired ere this on account of anno domini. But I shall always look forward to the day when health again permits me to rope myself on behind François Trescazes. One can pay him no greater compliment than by saying that he possesses to the full all those inherent qualities which have made the Swiss guides famous throughout the world.

On the following morning most reluctantly we packed, and after an early lunch bade a fond farewell to our delightful proprietor, M. Vergez-Bellou, and drove quietly down to Luz. Fourteen days before we had walked laboriously up with an ambitious programme, and now we were driving away having fulfilled every item.

It is not given to all to know and love the mighty peaks. But to those who do there is a certain indescribable bond, which is denied to the great mass of humanity. It is denied to the tourists, with their paper bags and egg shells, and to those who visit the mountains because "it is the thing to do;" it is denied to virtually all, save that much-maligned class, the climbers; and it is only revealed to those who climb because they must, because something within compels them so to do. They cannot keep away, even if they would, for when the climbing season comes their blood surges up at the first promptings of the mountain fever, and before they are aware of it they are crying with Matthew Arnold:

'' Blow, ye winds! lift me with you! I come to the wild. Fold closely, 0 Nature! Thine arms round thy child."

The brake carried us all too quickly away from the scene of our perfect holiday. Soon we were at Gedre. Once or twice we stopped to take a photograph of some exquisite glimpse of a mountain half hidden behind furry clouds. One last peep of the Breche de Roland, then a bend in the road hid it from our eyes. The last sight of snow had gone and with it came an intense yearning to turn and go back to the little village hemmed in on three sides by mountains.

We reached Luz to find the autumn fair in progress. Cattle from all parts had been driven in for the annual sale, and flocks of sheep occupied most of the open spaces.

We left in the late afternoon by the little electric railway for Argeles, a small town situated in the lower Pyrenees, further down the line. And ever and anon as the diminutive train swung round sharp curves we caught sight of high peaks whose acquaintance through lack of time we had been unable to make. Gradually these were left behind, and comparative foothills took their place. One last lingering look at the spot where the giants lay hidden and we settled back in our seats with nought but memories to view.

That night we slept in Argeles, and the next day were being borne swiftly northwards, bound for Paris and home.

Lake Gwendolyn, One Of The Sources Of The Red Deer River.

The Valley Of The Hidden Lakes

By Walter D. Wilcox

[Published by Permission of the Geographical Society of Philadelphia.]

One of the chief attractions of the Canadian Rockies is that they still possess little areas here and there, many of them quite near the railroad, that have never been explored. Even to the tourist who walks a few miles into the woods from the great hotels at Banff and Lake Louise, there comes a feeling of being in a primitive wilderness where the possibility of meeting bears or Indians or other imaginable dangers gives a delicious feeling of insecurity and adventure. The idea of penetrating still further into the mountain fastnesses and of finding some region hitherto unseen by any human visitor, in a word of being ‘’ Monarch of all he surveys,’’ for a time at least, makes an appeal too strong to be resisted by the real nature lover.

A remarkable example of the proximity of such little known places came to the writer’s experience in 1921. The region in question is not more than twenty miles from the Chateau Lake Louise, and lies in the next range to the east from that famous resort, in the limestone mountains of the Slate Range. It is the valley of a stream that is one of the principal feeders if not the true source of the Red Deer River. At its end, Bonnet Mt. (10,615 feet altitude) is a conspicuous landmark and the Bonnet Glacier, more than three miles long, is the source of the principal stream-Further down the valley rise the two peaks of Mt. Douglas, each about 11,000 feet high, which from their difficulty caused such a stir among mountain climbers a few years ago.

That no one, apparently, had ever entered this valley seems little less than a miracle. Located in such a comparatively well-travelled region as the valley of the Red Deer River and visible from the main trail and from surrounding peaks one marvels that it had riot been well known for years. Its area was indicated by a blank on the latest available maps and no one of the old timers could be found who claimed ever to have entered the valley. Every one agreed that the lower part of the valley was swampy and difficult of access, and so in the multitude of other wild places it had been passed by and neglected. Obsessed by the idea of a muskeg at its mouth, impassable for horses, my friend A. L. Castle, Albert Halstead, Jr., and the writer had made, five years previously, a complete circuit of the surrounding mountains trying to discover some easier entrance. We found it completely enclosed by a continuous rampart of mountains. We did, however, get one glorious vision of this mysterious region after having climbed up from the head of the Panther River and after having reached an altitude of 9,000 feet on the afternoon of a day crowded with adventure. This was indeed the banner day of our trip, and one whose memories will never fade for any member of our little party. Imagine three worn and weary travellers, shaking somewhat at the knees but with hearts beating high in hopes and expectation as they approached the crest of a ridge where a view probably unseen before was suddenly disclosed. Some one shouted ‘’ There’s Bonnet Peak,” and, as we ran eagerly forward and a little down the further side, a smiling picture of glaciers, lakes and forests lay before us. It would have been very easy, besides being a very pleasant thing, to have run down the long scree slopes two or three thousand feet into the new valley, but we were miles—how many we did not realize at the time—from our camp, which we barely reached at nightfall. Bad weather and heavy snow prevented further attempts that season.

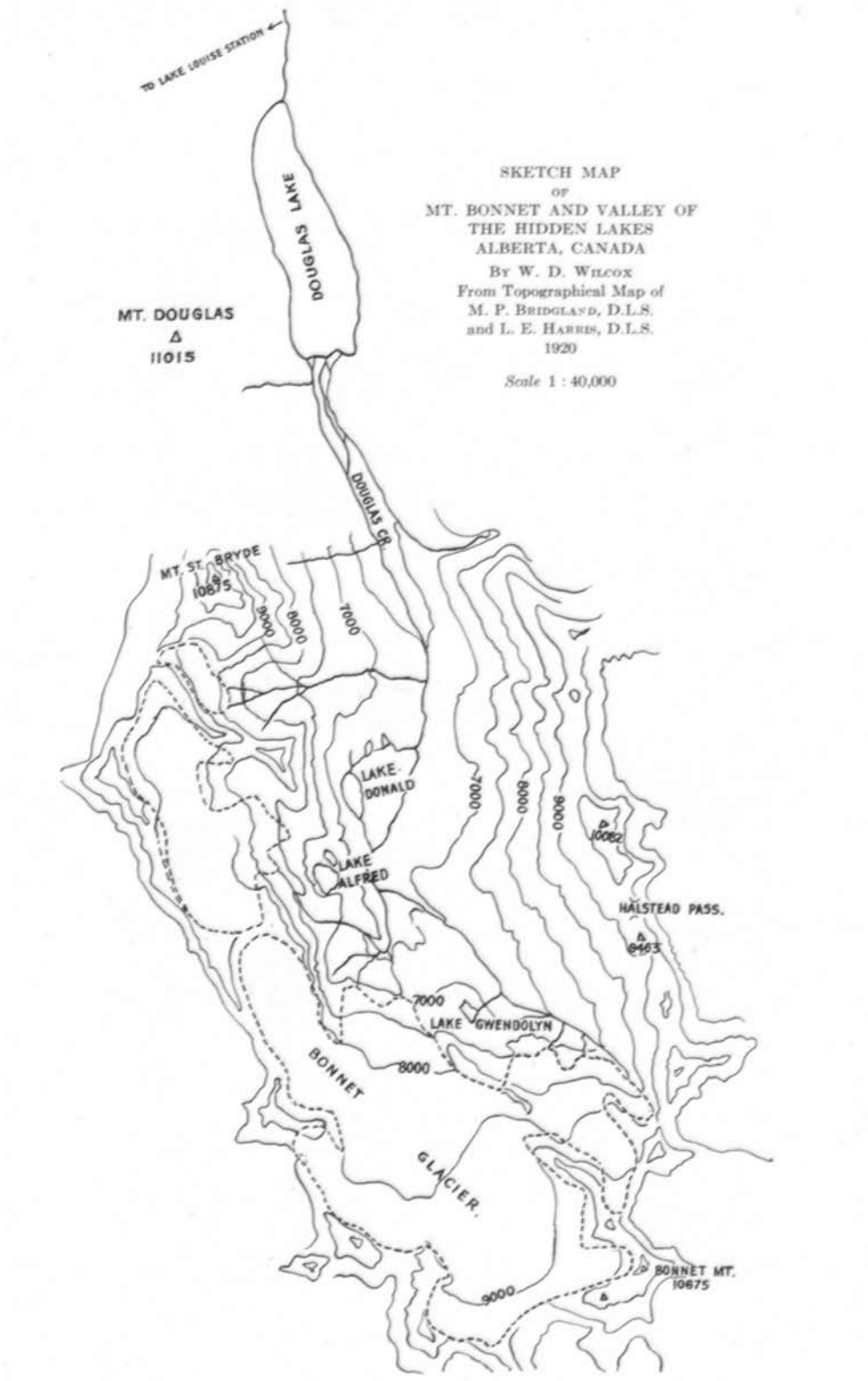
Memories of our first trip still lingered, and again in the summer of 1921 Mr. Castle and I decided to enter the valley by its natural entrance, muskegs or no muskegs. Leaving the Canadian Pacific Road at the station of Lake Louise, we ascended Corral Creek and passing Ptarmigan Lake, whose wild and barren grandeur was enhanced by a brief shower of hail and thunder, we camped

after a march of twenty miles at the game warden's hut in the Red Deer Valley. On the second day's march about noon we forded the Red Deer and struck east across the lower flanks of Mt. Douglas. Our packer, Stephens, had never seen this region before, but he was an expert with pack-horses and showed the utmost patience and good judgment in finding a way through the timber. We had many ridges and side valleys to cross and for part of the time we could not see our bearings in the thick forest. After about two hours, however, we realized that we were nearing the top of the principal ridge and shortly after this to our great joy we saw the waters of the large and muddy Douglas Lake lying below us. Glimpses through the forest showed the entire valley which we had first seen five years previously and it certainly was a beautiful sight. Descending rapidly we came out on the shore of the lake where a faint game trail aided us in skirting its shores. The only sign of human handiwork were axe marks on some of the trees, which, judging by the subsequent growth, we estimated to have been made not less than twenty years previous to our arrival. Beyond the lake there was no sign of axe or fire, of horses' hoofs 01 camp site, and it seems more than likely that we were the first party ever to have entered and camped in this valley if we except some Indian hunting expedition.

The day of our arrival was one of the most perfect I have ever seen. The air was full of ozone and the fragrance of pines after a night of rain. The sky was cerulean blue above, and green near the horizon, while cumulus clouds threw purple shadows over the gray mountain slopes and forests. We could hardly keep up with our horses in our endeavour to get photographs of the ever-changing and exquisite views. The lake is about two miles long and, arrived at its end, we came out on hard gravel washes where the river sweeping back and forth had levelled the valley floor somewhat like the gravel washes of the Saskatchewan and the Athabaska further north. Instead of muskegs and other difficulties we found a level surface so hard and smooth that one could have driven an automobile for long stretches over it.

Now that we were in the valley proper we soon realized that we were surrounded by no ordinary scenery. Every detail was cast in a large and inspiring mould. The cliffs rose in tremendous leaps more than 5,000 feet above us and their lower flanks were covered with a virgin forest untouched by fire. The only bad feature was the almost total lack of grass for our horses, and, after skirmishing around in several side pockets in vain, we sent Stephens up the main stream, but he came back and reported that a canyon and beyond it a glacier seemed to block our way. So we camped in the woods in early afternoon with the idea of making further explorations the next day on foot.

After lunch Castle and I scrambled up the slopes near our camp so as to get a better view of the country ahead of us. It has always been my experience that more can be learned about a new country from a height than by going along the lower levels. Of course, from a height it is not possible to learn many important details such as the location of trails, fords or other items, but one can get a general idea and pick out alternative routes so that in case one is blocked another can be utilized. We climbed through thick forests of beautiful timber a thousand feet or so and came out on open limestone slopes from which we commanded an extensive view. About a mile above camp the gravel flats came to an end and, as Stephens said, there was a sort of canyon. We noticed something very peculiar about it, however, and it reminded me of those landslides that are more or less common to the Canadian Rockies such as in the Simpson Valley near Mt. Assiniboine. Immense blocks of stone were scattered about and the main stream seemed to force its way through them, though its location was concealed by the forest. Beyond the canyon another level stretch appeared and then beautiful slopes sparsely timbered led up to the foot of a large glacier gleaming like silver



Sketch Map of Mt. Bonnet and Valley of the Hidden Lakes, Alberta, Canada. By W.D. Wilcox

in the sunlight. Our hearts were immediately set on this region for a camp, and we discussed plans for moving the next day so as to have the advantage of being in the midst of so many interesting places that invited exploration. We hastened back to camp and advised the men of our change of plan. Our tepee was well lined with balsam boughs, whose fragrance mingled with the aroma of the camp fire smoke and later on with the odour of frying bacon and sundry items that made a very powerful appeal after our long day's march. We managed a bath in the icy water of a nearby stream and then after a nip of Scotch sat down to a splendid repast. Presently the chill of night fell over the forest, the stars twinkled amid the evergreens and the crackling fire within the tepee threw shadows of our figures on the canvas. At length the fire died down, our voices were hushed in slumber and no sound except the distant murmur of the glacial stream disturbed the silence of a wilderness never-before broken by a human visitor.

The next day proved a continuation of the fine weather we had enjoyed on our arrival. While the men were packing, Castle and I went on ahead with the idea of finding a route through the rock slide. Skirting the banks of the stream for a mile or so we reached the scene of a great catastrophe in some former age, though it must have occurred since the last retreat of the glaciers. There were immense blocks of blue or yellowish limestone piled up in wild disorder and forming, in some places, grottoes secluded from sunlight and hung with ferns. Tall spruces grew among or on top of these massive blocks of nature's architecture and with the distant peaks and glaciers appearing between them made a landscape that was most unusual and attractive. The valley stream leaping in foam from one level to another in a small canyon added its wild voice that seemed to harmonize with the character of the place. While Castle was photographing in the canyon I went a little further and reached a point where the upper part of the valley opened to view. From here the large glacier at the valley end appeared far more impressive and an ideal landscape was disclosed over and above the winding stream now glistening brightly in the sunlight.

Absorbed in the beauty of the scene, I was quite unaware of something that was observing me with hardly less interest. Turning slightly to one side, I saw a splendid buck standing only a few yards from me, with head and antlers raised high, and regarding me, apparently, with the utmost astonishment and curiosity. We continued to gaze at each other till at length the beautiful creature bounded away. A short way down the trail he almost ran into Castle, who was sitting with camera in hand but had not time to get a snap shot. Meanwhile we heard the bell of our pack train and could descry our horses approaching. The buck continuing his flight encountered our file of men and horses and for an. animal that had probably never before seen a human being it must have been a rather strenuous day.

There was not the slightest difficulty in getting the outfit through the slide and we advanced rapidly over gravel washes and then followed a side stream through willow and alder bushes, where we saw two more deer. Arrived at the •final slopes of the valley, we entered a magnificent forest of very large spruce trees where from time to time we paused to admire the perfect symmetry and proportions of some of the larger trees. Splashing through shallow streams, we began a sharp ascent of the forested slope and soon began to enjoy views of the entire upper part of the valley. The horses made faster time than we, and Stephens stopped from time to time to admire the views. His picturesque figure with leather chapps and gaily coloured bandana made a typical picture of the west. We were on the edge of a high bank which rose 500 feet or more from a torrent below, and beyond it and not more than a mile distant the immense tongue of the Bonnet Glacier descended below tree line. The great amphitheatre of peaks made an encircling wall of fine proportions, everywhere hung with glaciers and streaked with foaming streams and waterfalls. Stephens could

not restrain his admiration, but held the horses back and said: ‘’ Well, I have travelled a lot through these mountains, but have never seen anything finer in the Canadian Rockies.” It is difficult to make comparisons, but we were much inclined to agree with him.

As we reached an altitude of about 7,000 feet we came to more open country, and ascending a final ridge looked down into a little side valley a mile or two in length which at the time seemed one of the most charming places I have ever seen. It was perfectly green, watered by a pretty stream that came from snow-banks and was encircled by rugged peaks. The trees grew in little clumps scattered here and there through the open reaches and the whole place had the peculiarity of appearing neat as though it had been trimmed and cared for by some expert gardener. No dead trees or ancient stumps marred the scene or even suggested the primitive wilderness. Enchanted with what seemed an ideal camping place, we descended a quarter mile, unpacked the horses and soon had a fire going and the teapot boiling.

So far we had not seen a single one of the three or four lakes that had made so much of an impression on us five years before. It seemed more than likely that one of them was located on a bench about 500 feet above us to the south. After lunch Castle and I ascended the steep grassy slope in that direction and passing through spruce brush covered with the white wool of the wild goats, we followed a pretty cascade till at length we came upon a little tarn or upland lake of clear blue water. It was hemmed in by a broken shore made irregular by ridges partly covered with spruce trees. The views across the water of the mountains and glaciers on the west side of the valley were unusually fine. I had carried up my eleven by fourteen camera and immediately began a search for good compositions. The day was not propitious as the sky was perfectly clear and for such scenes it is necessary to have clouds and cloud shadows, but I was looking forward to another day. We went back to camp, but hardly had we arrived there before the sky became flecked with cumulus clouds and I rushed back, making a breathless ascent and reached my camera just in time to take a lovely effect of cloud shadows and calm water, which was never again repeated while we were in that region. Thirty seconds later and I should have lost what turned out to be an unusual photograph. We named this beautiful sheet of water Lake Gwendolyn and the two larger lakes now visible across the valley Lakes “Donald” and “Alfred,” after Sir. Castle’s children.

We decided to remain a day or two longer in order to explore more thoroughly the surrounding region. Together or separately we visited one of the lakes across the valley, and the foot of the Bonnet Glacier, which creeps over a cliff with a many pointed and much crevassed lip, and supplies great torrents of muddy water to make the source of the Red Deer. Castle climbed again to Halstead Pass which we had reached from the Panther, and much to our surprise Stephens rode his horse beyond it to a height of over 9,000 feet. An even slope and a fine hard scree made this possible.

When we arrived at this camp we saw a goat scrambling along the cliff above us. A little later we saw a herd of fifteen or twenty on the bare slopes on the east side of the valley, but as evening came on there was a veritable gathering of the clans from all the feeding grounds so that we had difficulty in counting them. In one herd there were more than forty and in another about sixty-five. These eventually joined up and made the largest herd I have ever seen in the Rockies. They ascended to about 8,500 feet and passed the night among some cliffs, coming down the next day to feed. The clouds had thickened up and a slight trace of smoke from forest fires appeared. As the last traces of twilight were fading the mountains were outlined in pale bluish gray, the nearer forests in a dull green, and over some of the clouds were lines of rose and fiery red. The whole scene was depicted in three colour tones and through the bluish haze gave a wonderful impression

of distance and grandeur. The question came to our minds why the artists do not abandon the stereotyped sunlight views and try to reproduce such effects of much stronger appeal.

Before closing it seems appropriate to express a few general ideas about this region. The valley is about twelve or fourteen miles long and more than three miles wide. So far as scenery is concerned it is far more impressive than the average valley in the Canadian Rockies and has more variety of interest than many of them. Almost entirely enclosed by high continuous mountains and yet with an imposing width, with virgin forests and unusually large glaciers and several lakes, the general impression is that of noble grandeur somewhat resembling the Yosemite, though with more variety. The beauty of the vegetation, the abundance of wildflowers and the presence of game, which was evident on every day of our visit, add to its charm. Throughout our exploration we failed to see any sign of a previous human visitor. The heavy tracks of a horse in certain kinds of ground leave an imprint that is visible for ten years or more, while the marks of a camp fire will endure longer than the average human life. We had a narrow game trail in many places, but a game trail is full of unaccountable twists and turns and takes no account of fallen trees or other obstacles that would stop a pack-horse.

The conspicuous features of the valley are the several fine lakes and the large glacier that descends from Mt. Bonnet. The latter is about three miles long and more than a mile and a half wide, an unusual size for this range of the Rockies. A certain mystery is attached to the lakes which seem to have been overlooked till our first sight of them in 1917. The records show that Mr. Drewry climbed Mt, Bon.-net in 1890, but it seems that these lakes and much of the valley itself are no visible from that point. Later on the two peaks of Mt. Douglas were climbed several times, but the Swiss guides seemed astonished that there were such lakes as we reported in that valley. Finally when we came in 1921 we had the greatest difficulty in locating them ourselves. It seemed appropriate to call this place the ‘’ Valley of the Hidden Lakes,” which name has been accepted by the Geographic Board of Canada, as well as those suggested for the several lakes themselves.

I was much surprised and not a little disappointed to learn later that this valley had been surveyed by the Topographical Survey of Canada, but on further inquiry was informed by Mr. M. P. Bridgland, who did the work, that he had never entered the valley, but that the survey had been “made from peaks at the head of the Panther and Cascade Rivers.” It is truly remarkable that such a fine bit of scenery as is to be found here has remained so little known to this late date. One marvels even more at the fact that the very heart of the valley may be reached in two days’ march from one of the largest summer resorts of the Canadian Pacific Railway. In fact, an active horseman could make it one day by a forced march. A trail could easily be cut through from the Red Deer River to the end of Douglas Lake and at small cost. For those who wish to visit this region in the meantime, the easiest way would be to ford the Red Deer about a mile below where the McConnell stream comes in and then work east and south till Douglas Lake is reached, after which there is no difficulty.

A Trip To The Geikie Valley

By H. E. Bulyea

While with the Alpine Club of Canada at Mount Assiniboine in the summer of 1920, in conversation with Mr. Cyril Wates of Edmonton, I learned that he had a strong desire to visit the Tonquin Valley which lies southwest of Jasper. He learned too, I think, that the desire was mutual.

We had both been in the vicinity, had looked and been fascinated. Like so many tales in fiction where youth meets maiden fair, gets one glimpse, and feels his heart surge with the world old passion—love, we had fallen under the spell of this charming region. But truth is often stranger than fiction. In our case we had hardly seen the object of our desires face to face. Like Isaac of old we had only heard of Rebekah's charms. But it was enough; our hearts were stirred, and the Tonquin Valley had since been the object of our dreams.

I will let Wates tell his part of this affair. As for me, it came three years ago while standing on the rocky slope of Mt. Edith Cavell. Looking up the Astoria Valley I beheld a sight I shall never forget. Great snow-fields in the dazzling sunlight of the early morning made a picture of the rarest beauty, and I was seized with a longing to see what lay beyond. At last the opportunity came when Wates invited me last summer to join him in an expedition to that region.

The morning of July 30th, 1922, found us both at Jasper in readiness for the start. Wates had preceded me by twenty-four hours, taking with him two young men —Gerald Wates and Lawrence Richards—who were to share our joys and vicissitudes and look after the horses. When I arrived the process of packing was already well advanced, and at first the number of horses tied up to the fence gave my monetary feelings rather a heavy jolt. But upon the explanation being offered that the greater share of these benign quadrupeds were intended for Mr. Brewster, his packers and a lady from New York, who were to accompany us part way, I soon recovered my equilibrium.

Shortly after noon all was ready, and amidst a cloud of dust our pack train of twelve horses swept through the town and, at last, we were actually on our way. Four miles up the beautiful Athabaska and then a turn to the right brought us face to face with Whistler Creek, one of the hardest parts of our trip. It was a hot day and at the hottest time of the day, and, without much previous training, we found ourselves up against a pretty tough proposition in making the four thousand feet ere we reached the top. Frequent rests were necessary, but our horses kept plodding on, and when at last we reached the camping place we found they had reached it about an hour in advance. One small tent was pitched for the lady of the party, but the rest of us preferred more room—the great out of doors. Soon after supper we rolled up in our blankets, and after our fatiguing day you may well judge we did not need much rocking to put us to sleep, I will not speak for Isaac, however, (one of the packers— not the Isaac first mentioned), for he undertook to look out for the horses when it was discovered that they had a tendency to feed towards home. The rest of us had such confidence in our Indian friend's ability under the circumstances that we were entirely care free and when morning came, as it seemed in an incredibly short time, we were soon ready for another start.

From our breakfast table we saw quite a remarkable thing—a range of mountains as if blocking our way, and with some of the most brilliant colours I have yet seen in rocks. Bright chrome yellow in places, great patches of brilliant red, and greys ranging from almost white to black, placed as if intended to enhance the brightness of these showy colours. Toward this our train was soon wending its way, and turning to the left just before reaching the foot of our recent brilliant acquaintance, we arrived at the summit of Marmot Pass about ten o'clock.

A sharp, descent was now in store for us. Mountaineering, like life, seems full of ups and downs, and I never did admire the downs in either case. After our laborious climb of the previous day, a descent of 1,400 feet seemed a great waste of effort. But such is life and such is mountaineering, so we must bow to the inevitable.

Without further mishap than the shifting of a few packs we found ourselves at last at the bottom and wending our way up the other side of a rapidly running stream—Portal Creek. Here we

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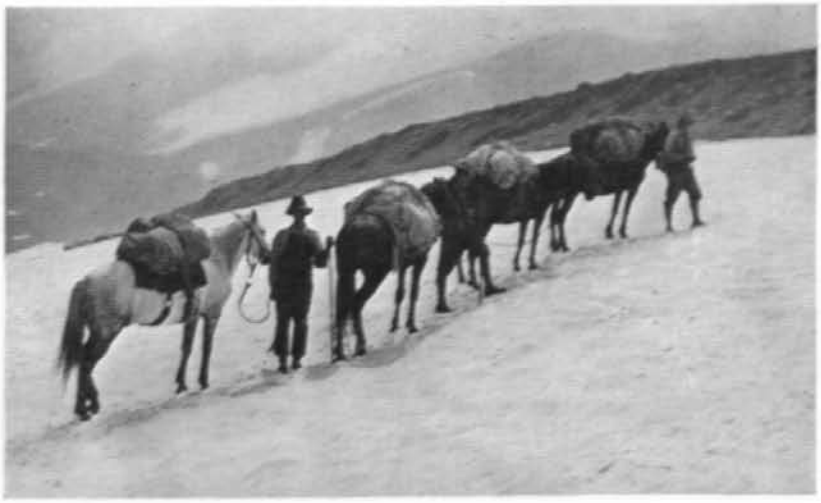


No. 2

No. 3

1. Amethyst Lakes, Tonquin Valley
2. Crossing The Ridge To Geikie Ck. Valley
3. Cirque At Head Of Geikie Ck.
Photos H. E. Bulyea

let the pack train proceed at its usually steady gait whilst we, who preferred to walk, ate delicious strawberries by the wayside and followed as we felt inclined.

After a rather uneventful but altogether charming day, we reached Amethyst Lakes at 5:00 o'clock, where we found camp already made and supper waiting. We did not keep it waiting long.

Here we had been promised a concert in the evening and Wates brought out his radio outfit, and soon we were busy stretching wires to big trees and making connections, hoping to hark back to the folk in Edmonton. But alas! this time we were doomed to disappointment, and only once when it came to my turn to listen in, was I reasonably sure I heard a voice. There were other voices that at first deceived me—cruelly deceived me. The sounds in my ear were accompanied by sharp jabs at the external part of that organ of sense, and I was soon reminded that mosquitoes have voices too and, because of my defenseless state, they were picking on me.

Amethyst Lakes are beautiful. Their colours are unique as far as I am able to judge from my knowledge of mountain lakes. Their name hardly gives one a true conception of their nature. There is something of the deep blue of the large fresh water bodies, together with hues reminiscent of the ocean. It was a delightful spot and we did not wonder that it seemed to be a favourite camping ground for those who had been going that way before. Things seemed to be growing better for us and we wondered why so few had gone beyond. Next day we were to learn the reasons: for from then forward the trail is rather tiresome—not from steepness, as in our first day's effort, but a great deal lies through low, meadow-like, flat stretches soaked with water, making poor footing, especially for the laden horses.

The morning of the third day we parted company with our genial outfitter and his party at Amethyst Lakes, and with four pack horses we set our faces once more toward our goal. We had high hopes of reaching our destination that night, but it always looks easier on maps, and the difficulties just mentioned made the journey still more arduous.

Mt. Geikie was our objective but, as we approached, we saw that the north face gave ample proof of its reputation as an impossibility. There was, as we had been told, no pass in the immediate vicinity of Mt. Geikie, so we made our way toward the pass which lies west of Mt. Barbican—the next peak beyond.

Here we were travelling over territory, for the most part making our own trails and without anything on our maps to show us how to proceed. This made slow going and, in attempting to cut off distance by skirting the west base of Mt. Barbican, we found our way blocked by impassable rock slides and had to retrace our steps to the water-soaked valley beside Tonquin Creek. By that time the day was so far spent we saw we could not make the pass that night, even if we found the way, which seemed unlikely, so we found as dry a place as possible by the edge of the trees and made camp.

Next morning the boys went back with the horses to Amethyst Lakes for some supplies we had cached at that camp and Wates and I started out on foot to explore the pass. The approach to the pass lies through a band of quite heavy timber, much blocked up with fallen trees, and at first we had difficulty in getting toward the rocks. At last, however, we found opposite the west side of the pass, running up beside a stream, a very easy path which evidently had been made by caribou as they had gone back and forth to their feeding grounds.[31]

31 The path, which we clearly blazed through the timber, starts in just south of a very large, flat rock lying in the middle of Tonquin Greek, well to the west of Mt. Barbican, at a point where the creek forms a sort of loop, which is directed towards the pass.

This led us to the west side of the pass, where we had calculated the day before we might find a way over. Our assumption proved to be correct, although we saw that it would be far from easy going for our horses. However, we picked out a route well up on the side of the small mountain to the right. It was strenuous, even for us, and at times it looked too difficult for the horses.

When we reached the summit we found ourselves on a narrow ridge, at an altitude of 8,200 feet, the other side of which sloped gradually away to the Geikie Valley. We had been travelling since leaving Amethyst Lakes most of the way through difficulties and were little in love with our surroundings; but now this ridge seemed like a sharp line of demarcation between the lower regions and a veritable paradise. Our spirits rose as suddenly and we felt that our troubles, if not entirely over, would henceforth be much less.

Here, under the bright sunshine of the southwestern slopes, the superfluous moisture had dried up. Flowers of every hue and of exceeding beauty grew in great profusion. Bees flitted from blossom to blossom, and the place seemed so different to the side from which we had so suddenly emerged that it hardly appeared possible we had not been transported in a dream to a beautiful fairyland.

Only one thing marred our pleasure. The scenery would have been magnificent but for this: a heavy pall of smoke, which had marred to some extent our views as we came along, now seemed denser as we looked toward the sun, shutting out much that we would liked to have seen beyond and making photography impossible. Indeed, this was to remain our chief disappointment during our stay in that part of the mountains. Little photography had been done in this great amphitheatre and we were anxious to bring home something that would show the wonders of this delightful region. As it is, our minds are filled with impressions which time will never efface, but words alone at my command seem very inadequate, and I feel at a loss in describing what I saw without the aid of our photographs.

To proceed: We explored the foot of Barbican Peak and passed around to a point opposite the Geikie-Barbican Col, where we found an ideal camping place. Here was a fine stream where we could get water for man and beast, and as fine a feeding ground for the horses as one could desire, right between our prospective camp and the neighbouring mountains. After these observations had been made, we returned to our camp we had left in 1lic morning and announced the good news to the boys who had returned from their journey a little ahead of us.

Next morning we had considerable difficulty in locating the horses, so we did not break camp as early as we had planned, but by ten o'clock we were on our way and after leading the horses up our "cow path" to the rocks, we began a somewhat laborious ascent of the pass. It was rather strenuous work, but we soon learned that our horses were going to fulfill our fondest hopes, and they certainly did good work that day. Mr. Brewster had told us that Thelma was one of the best lead horses in the mountains, and she seemed to be trying to live up to her reputation. She succeeded-—and so did the others as it were by force of her example—and, without mishap, we reached the ridge and were soon sliding down the shale of the other side to the meadows below.

We reached our chosen camping ground early in the afternoon and before the sun had set we were quite comfortably situated. Our sleeping tent was set up on a ridge overlooking the pasture, and another one pitched over a fine sandy bank, where a level excavation had previously been made for the purpose of improving the floor. This was to serve as cooking place, living room and dining hall, and we soon were able to get full satisfaction from our plans; all but in the last named requirement, and this was not due to lack of appetites but because of them.

And now another kind of feast was in store for us, one. for the eyes. Occasionally the

smoke cleared away sufficiently to give us a better peep at the mountains on the south side of the valley, an immense ditch that lay between. Wonderful! Yes, more than wonderful! How-shall I describe the beauty and grandeur of these huge locks and great intervening masses of snow and ice! To the south and west seemed to lie, half hidden in the haze, a vast number of snowcapped peaks. These were often enhanced by the colored light due to the smoky atmosphere, but we longed to see beyond.

Looking to the southeast there was enough that we need complain no more. Simon Peak, of the Fraser Group, arose amidst the many fields of snow as if it had struggled hard to lift its monstrous head and at last had burst its bonds and come forth, leaving oil its breast the great, white, dazzling weight that had been holding it down. To right and left and much nearer, two great pinnacles of rock stood guard, and well they had been named respectively, Portcullis and Postern.

Further to the southeast were the other peaks of Mt. Fraser; and whilst we were unable to see much of the mountain from our camp, we later had an opportunity when we made our first attempt on Mt. Geikie. Here we got a great view of this splendid mountain and its five mile glacier which must be one of the most wonderful sights of its kind to be found anywhere. To describe all we saw would far exceed both my ability and the space allotted to me. I can only say it seemed to us the best yet. The rest—the richness of the colours, the immensity and the grandeur of this great amphitheatre—I must leave to your imagination.

The following day, after looking over the possibilities of climbing Mt. Geikie from the west, we decided to look for something easier and went around to the southeast side on a reconnoitering trip. We were somewhat surprised to find two small lakes: one near the face of the mountain, into which tumbled the water from two long couloirs that seemed to reach to the very heavens, the other, opposite the Geikie-Turret Col. Neither of these showed on the map, so we considered ourselves the discoverers and therefore entitled to the privilege of naming them. Wates suggested the ‘’Inkwells,” due chiefly to their colour resembling that of ink, but there was also something about their peculiar, cup-shaped shores and positions almost side by side that made the suggestion sound like a very happy thought. The two new found (I very nearly said new born) twins were thereupon duly christened without waiting for the approval of the National Geographic Board. Prom the first of these lakes we decided there looked like a feasible route to the summit, so we returned to camp, packed up a few supplies and bedding, and that evening were taken by Gerald with one of our horses to our chosen bivouac by the side of the lake. Gerald returned with the horses, after having been instructed to come for us the next day at six. This he did, and not finding us there, watched and waited until bedtime; then rolled up in our blankets and spent the night alone, much disturbed with anxiety concerning our safety. You will see in my companion’s account of our climb that we did not come down that night. We did, however, come down next morning and were met shortly afterward by our faithful Gerald and his favourite horse. Needless to say our sleeping quarters at camp that night, after spending the previous one high up on the mountain, was an improvement that was much appreciated.

We had been defeated on our first attempt but, after a day’s rest, we were off again on our second and also unsuccessful attack.

Our vacation was now drawing to a close and the weather looking unfavourable, after a day’s waiting hoping that it would clear, we decided to break camp and trek for home.

Defeated at every turn, but still alive and cheerful, we were anything but discouraged. Even the bad weather was not an unmitigated evil. We were photographers as well as mountain climbers, although amateurs in both lines, and we had been praying for rain to clear away the smoke. Before

we left the smoke had been sent where we so often would fain consign it, but now the clouds and mist remained. However, the sun did peep out occasionally and, after long waits, we once in a while got a picture that partly compensated for our previous disappointments.

Then back again we went, back to our camp by the swampy meadows, halting only to take on our cached supplies; back to our delightful camp by the Amethyst Lakes, more beautiful now than ever in the cloud and sunshine and shadow and clear, smoke-freed atmosphere. Here we did not mind halting for a night. In fact, had time permitted, we would have enjoyed a week in such a happy hunting ground for the camera fiend. But we must keep going, and in the morning, as soon as our stray horses could be located, we packed and were off again.

Three days, this time, instead of five, took us over the reverse of our journey. As Sunday had sent us forth, Sunday received us again. So did our outfitter, hosts and friends, Fred Brewster and his genial partner, Mrs. Brewster.

They seemed glad to see us, but I am sure no more so than we were pleased to sit at their table and have once again a real good meal, and never did the best culinary art make a greater appeal. I am free to confess that our experiences in cooking at camp and on the trail most assuredly had something to do with our appreciation; but I am equally sure that, apart from that, we had ample proof of the Brewster's reputation for hospitality.

A Pack Train Trip, North Prom Jasper, Alberta

By Caroline B. Hinman

In the summer of 1913, in the lovely Lake O'Hara Valley, at the foot of Mt. Cathedral, the Alpine Club of Canada introduced me to the glorious snow-capped peaks of Canada, and to the exhilaration and abiding joy of camping among them. So deep an impression did that experience make upon me, so much benefit did I derive therefrom, physically, mentally and spiritually, that before the following winter had half begun, I had determined to go back and to take with me others who, without being led, might never find the way to that health-bringing wonderland of unpolluted air, warm sunshine and brilliant flowers—the land of the spruce, the rock and the snow.

I set to work, mapped out a trip, secured reliable guides, saddle horses and a pack train, and with a little band of six girls, all eager for the great adventure but inexperienced in the ways of wilderness travel, crossed the continent and plunged into the Canadian wilds.

The plan succeeded, the girls came home, extravagant in their enthusiasm, and their parents were so overjoyed with the health, energy and bounding spirits which their daughters brought back from the mysterious land of mountains, that they all said "Take them again next summer." And I did, with others added.

Every summer since then, with the exception of two, each time with a fresh group of novices, I have ridden and camped in the Canadian Rockies, from the Waterton Lake country in the south to the Sulphur River in the north, from the untracked forests of the Goat River district on the west of the Divide, to the Southesk River and Mt. Dalhousie far to the east. Forty-six different individuals have camped with me—boys and girls, and men and women. Of this number twelve have gone twice and one three times, which proves the strong call of the mountains. All have come back with health and energy and renewed vigour, and all have been filled with enthusiasm for Canada's great playground. For this chain of events and the good resulting therefrom, I hold the 1913 camp of the Alpine Club of Canada entirely responsible.

In 1921 we had an especially interesting trip. There were twelve in the party. We reached Jasper, Alberta, on July 20, and put ourselves in the charge of our guide and outfitter, Donald Phillips, and his efficient corps of men (four packers and a cook). We were delayed one day in our start, because of the high water in the Stony River. Our trail should have led us from Jasper back along the Athabaska to Devona, near Jasper House, then across the Stony not far from its junction with the Athabaska. Phillips had ascertained, however, that the ford was washed out and the water so deep and swift that he considered it unsafe to put our horses through. We therefore shipped the whole outfit of forty-seven cayuses and 5,000 odd pounds of equipment by freight train to Bedson, thus safely transporting them, by railroad bridge, across the turbulent Stony. We passengers, with out personal duffel, followed by the evening train from Jasper and arrived in Bedson at ten o'clock, by the light of a full moon.

It was the mysterious and fascinating beginning of a trip full of adventure. The puffing engine of the train, the startled horses waiting in the shadows to carry our duffel into camp, the dim forms of the men unloading the dunnage from the baggage car, the dusky mountains standing guard around and the open, rolling hills bathed in brilliant moonlight, made a scene which I shall never forget. The snorting train finally rumbled off, the men packed the dunnage on the horses and drove them ahead while we followed on foot, a quarter of a mile across the stubble, to the white tents of our camp on the bank of a fresh-water stream. Soon we were all tucked in our sleeping-bags, and the quiet which in the mountains is made up of a myriad of different noises, chief among which is the sound of running water (and that night, unfortunately, the buzz of many mosquitoes), descended upon our little encampment.

For two days we followed the Stony River, past the lovely eighty-foot fall below which the river narrows to a precipitous gorge. Where the Stony swings to the west we kept on to the north, up Willow Creek, crossing Rock Creek and skirting the western shore of Rock Lake. At the head of the lake we camped for two days to catch some of the fine lake trout from a raft which Phillips made for us. Our route followed the North Fork of the Hay River to Thoreau Creek; then we crossed the alp-lands, brilliant with wild flowers, with a gorgeous view of the valley of Hay River behind and the valley of the Baptiste ahead.

At the forks of the Baptiste we stopped for another day, which each one passed according to his task. Five of us climbed a bare summit across the river to the south of camp and were repaid by an extensive view of the main Baptiste flowing eastward to the plains, which spread like a sea on the horizon with the big defile made by the Athabaska River, as it cut its way through them, easily discernible. To the northwest stretched the timbered valley of the north fork of the Baptiste and to the southeast we could follow our route of the last few days. When we returned late in the afternoon we found the camp in great excitement over a ten-pound Dolly Varden trout which one of the girls had caught, playing him until he was near enough shore for her to descend bodily upon, with both arms clasping him tightly, for fear he should escape before she could lift him on her light rod from the water.

Then followed days of beautiful travel over a high pass between the north and south forks of the Baptiste, on to the Muskeg River, over the rocky pass to the Sulphur, where we camped for two days near a solitary Cree Indian grave with its little fence and sloping rock enclosing the mound with a cross at its head. We here picked a lofty summit to the northwest of camp across the Sulphur River and made an all day's climb. As we emerged from the last timber we surprised a band of five mountain sheep who bounded away at our approach not more than twenty-five yards distant. We lay for half an hour in a basin near the summit, watching, through our glasses, the playful antics

of thirty-one sheep in another basin opposite. There were big-horned rams, watchful ewes and the most sportive of lambs frisking about and butting each other in sham battle, apparently much to the edification of their mothers, who seemed to be watching them with a human pride and affection. It was five o'clock before we reached the final summit and in the soft, late afternoon light the view that spread itself on every side passes description. To the east stretched the prairies, luminous in the glow of the afternoon sunlight. To the north rose the mighty glaciered mass of Mt. Sir Alexander with soaring Mt. Ida nearby. To the southwest rose Mts. Bess and Chown, and farther south we could distinguish Mt. Robson.

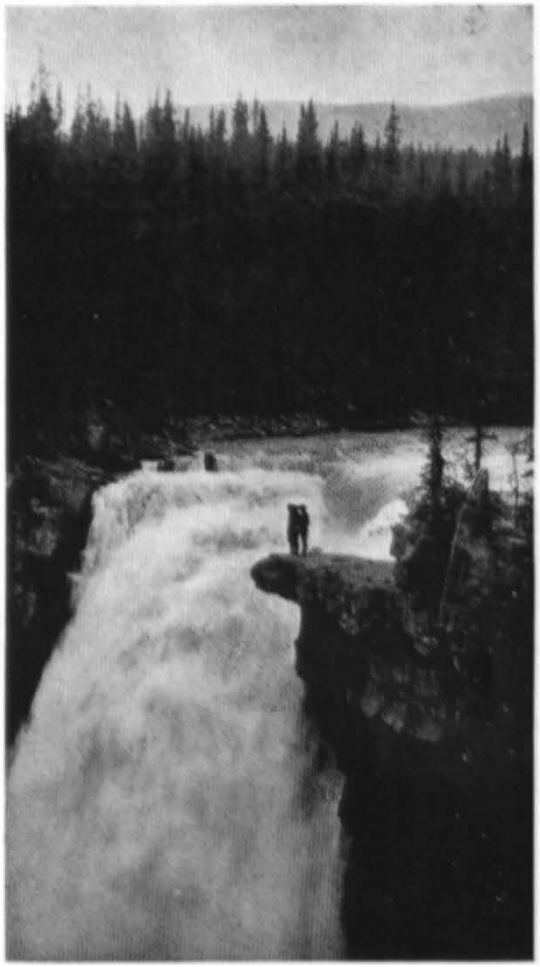
We left the Sulphur and turned westward, crossing a timbered pass and coming on to Hardscrabble Creek some miles from its junction with the Smoky. We followed the Hardscrabble to its source and there on the summit of the pass came upon a monstrous grizzly, grubbing for gophers. We saw him from a distance and, being to the windward of him, approached cautiously nearer and nearer. He was facing us, but so engrossed was he in his absorbing occupation that we were able to get within 150 yards of him before he became aware of our presence. He was in the open and through our glasses we could see the very expression of his face and watch it change when he glanced up and saw the cavalcade of horses and humans silently gazing upon him. The awkward, ambling, but terribly swift gallop with which he made off made us realize what a horrible sensation one would have if chased by a grizzly.

We followed Blue Creek from its source on the summit of Hardscrabble Pass to its junction with the Stony River, travelling pretty nearly due south. We stopped to investigate the graceful and lofty arch of a natural rock-bridge, which spans a fifty-foot waterfall, high up on the east side of the valley of Blue Creek. As we came out from the thick forest of jack pine which fills the Blue Creek Valley, we found ourselves upon a high, open bluff with the Stony River flowing below us and to the west, far in the distance, the lofty summit of Mt. Robson.

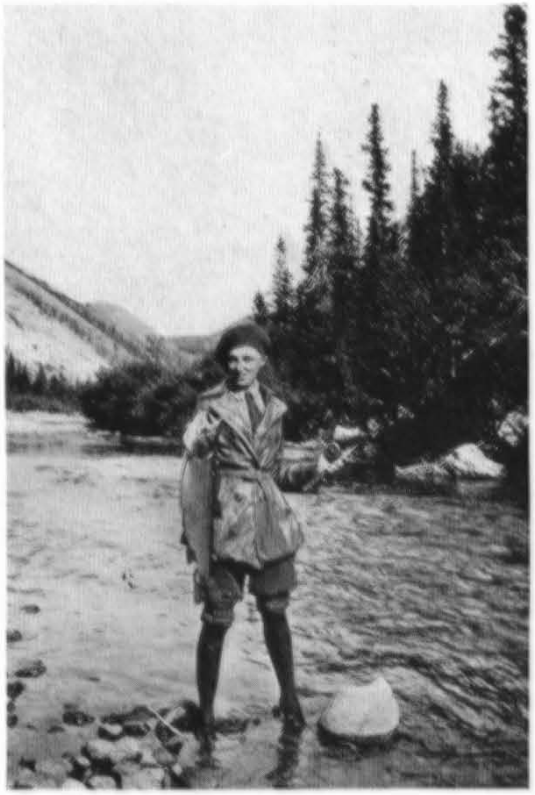
We followed the Stony to its source on Stony Pass, where we came suddenly upon a bill bull moose, a cow and a calf. We watched them lope swiftly away through the scrub balsam on the open mountain side, in full view for nearly ten minutes. We descended the Pass to Twin Tree Lake, then on down and across the Smoky.

Here we left a cache and travelled light for a four-day trip to the head of Short River, from where we hoped to make the ascent of Mt. Chown. The valley of Short River is soggy and wet and there is no good camp ground in it. We took the outfit Jo the snout of the Short River glacier and camped on the moraine in a small but thick tangle of spruce and underbrush, in the lee of the high wall of the glacier. In claiming this spot for our camp, we had to oust a patient black bear, who with her two tiny cubs had taken up her abode here. We drove them off, wishing that we might keep the babies as playthings. Such cunning, soft Teddy-bears I had never seen before.

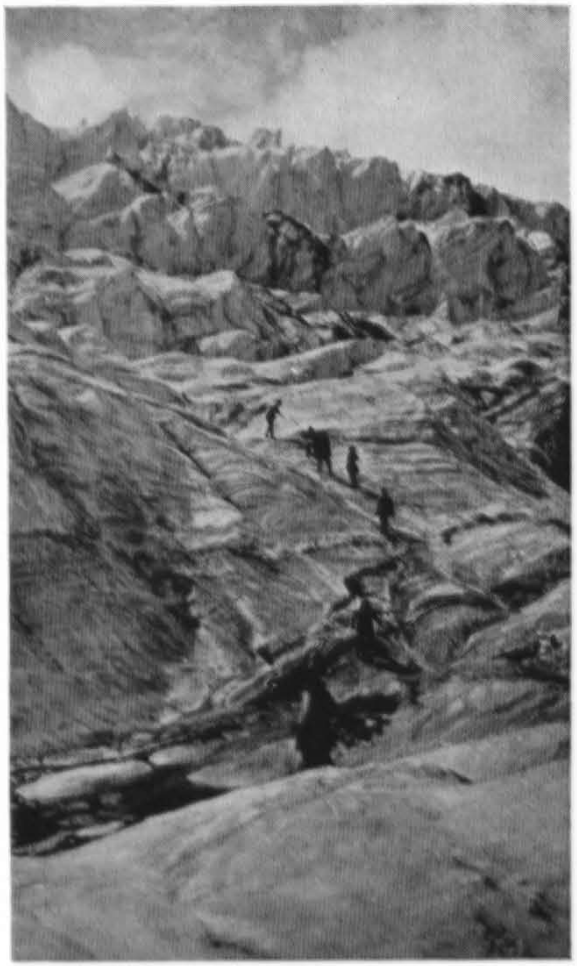
We spent one day exploring the huge glacier that pours itself into the short but torrential river which carries its silt and ice out into the Smoky. We picked out what we thought a possible route to the summit of Mt. Chown, whose snowy head we could see behind a nearer range of mountains. The following day was cloudless and we started off in high spirits to make the ascent. We climbed the main glacier in a westerly direction for an hour, then turned sharply to the south and ascended another uncrevassed glacier, which we thought would lead us to the main glacier from Mt. Chown, over which we could ascend to the summit. It was easy going and we made good time. Instead, however, of leading us to the Chown Glacier, it took us to the summit of a mountain of its own, from which we looked down on to the Chown glacier, with Mt. Bess and Mt. Chown immediately opposite and to the west of us, but with precipitous cliffs between us and them. Our



Falls on Snake Indian River. Photo, L. A. Lewis



Big Trout Caught Baptiste River. Photo, Donald Phillips



Seracs on Short River Glacier. Photo, C.B. Hinman

disappointment was keen, but there was no possible way of reaching our mountain that day and we could see that the best way of approach was from the head of Glacier Creek* and not from Short River at all.

In clambering over the cliffs we came into close proximity with a band of sixteen mountain goats. The ridge of rock on which we found ourselves was so narrow that the goats could not well get out of our way without passing very close to us. This near view of the agile and timid creatures, as well as the glorious panorama of mountain and glacier which lay below our airy perch, made up in part for the disappointment we felt in not having even set foot on the mountain we had started forth so hopefully to climb.

We broke camp the next morning and journeyed back to our cache on the Smoky, picked it up and went on an easy two day's journey to the head of Glacier Creek,[32] where we camped on the gravel flats below the big Chown Glacier.

Here we waited a day for the weather to clear and on the morning of August 24, Phillips, Miss Merck, Mr. Richard Day, Mr. O'Brien and I set forth once more to try to conquer Mt. Chown. We left camp at 6:30, climbed the steep ascent to the glacier and by seven o'clock were on the solid ice. Here we were greeted by a view of the summit of our snowy mountain with the sun shining upon it. It seemed a good omen, although when we had arisen at 5:30 the weather had not looked too propitious. The glacier upon which we found ourselves wound gradually upward in an easy ascent, around the foot and past the precipitous cliffs of Mt. Bess, with a frozen, uncrevassed surface. We swung along, unroped, at an easy pace, and made such good time that in three hours we had reached the snow-covered glacier above. Here we roped and had to proceed more slowly. The grade was steeper and the big crevasses which we had seen through our glasses on a reconnoitering climb of the previous afternoon, began to appear. Now, too, the sky became somewhat overcast and occasional snow flurries occurred. However, the sun appeared between each flurry and we had no thought of an approaching storm. After an hour's further climb we stopped for a bite of lunch on the last rocks which jut out from the glacier, on the side opposite Mt. Bess. Then began the hard pull toward the summit. It, however, seemed so near above us that each time the clouds lifted enough for us to see it we were renewed with hope and determination to reach the top. For two hours we climbed steadily and silently upward, skirting the big crevasses, whose yawning openings were enough to make the experienced as well as the inexperienced members of our little band shudder. All this time there was intermittent sunshine and snow flurry. In the sunshine we looked joyfully to the summit, now easily discernible close above us, and in the snow flurries we kept our eyes on the foot prints of the one in front and plodded slowly on.

About one o'clock the atmosphere seemed to change. It grew colder, the sun disappeared entirely, the snow-flakes became larger and steadier, all contours disappeared and we were enveloped in a rather terrible and silent whiteness. Everything looked the same, ahead, behind and on each side—there were no contrasts—and except for the shortness of our breath it would be hard to tell whether we were going up or down. We knew we were just approaching the arête which led to the summit, which we estimated was not more than 300 feet above us. We saw the arête loom out of the whiteness ahead, but between us and it was a foot and a half wide bergschrund, about the level of our shoulders as we stood on the slope. In. sunshine this difficulty would have been nothing to overcome, but in the blinding whiteness and silence and cold of the falling snow it seemed too dangerous to attempt, and I gave the word to Phillips to turn back.

32 Apparently the Glacier Creek here mentioned is Bess Creek, the stream flowing from Bess Pass, and augmented by the flow from Chown Glacier.—Ed.

Each member of the party was plucky to the core, and none wished to say turn back, but I could sense the relief which each felt when we left that bergschrund behind and started down the steep slope toward camp in the valley. How far away and unutterably cheerful the thought of the camp fire was. It was a long way off and we had serious business and many hours of travel before we could hope to reach it. There was not a word of complaint from anyone, and the girl in the party even sang. Our tracks made so short a time before, were entirely obliterated by the swiftly falling snow. We trusted to Phillips' unerring sense of direction and prayed that a miracle would save us from those horrible crevasses, which we knew were all about us. but which, in the blinding storm, we could not see. Slowly and cautiously we progressed, sounding each step with our ice axes.

It was fifteen minutes perhaps after we had turned around, when hearing a muffled cry ahead I, who was fourth on the rope, glanced quickly up and saw Dick Day who was second on the rope, on his knees in the snow, grasping the rope which slid from his coil down, down into an opening in the snow a few feet ahead of him. Phillips was no where to be seen—only the telltale rope, which was fastened to his waist, disappearing in the snow.

Dick cried ''Anchor for your lives," and we anchored, digging our ice axes deep into the snow and bracing ourselves against them to pull on the rope. We pulled as though expecting to lift our one hundred and eighty pound guide bodily from the crevasse in which he dangled. A muffled voice then reached us "Give me slack. You are cutting me in two." Relieved to hear his voice, even coming as it did from the bowels of the earth, we gave him slack and awaited his directions. He was in a narrow crevasse which he could straddle. Using his ice axe, he hacked out a toe-rest in the straight ice sides of the crevasse, shouted to us to pull, and bracing himself got his toe in the niche. Then he hacked another hole in the other side and through his own ingenuity and what little aid we could give by hauling, he emerged in five minutes time, breathless and with a broken rib, but otherwise unhurt. Our rejoicing for the moment was great, but we were sobered quickly when we gazed ahead into the vast whiteness of the storm, in which the whole world looked like a flat white surface.

We could not stand there and freeze, we must go on. Still more cautiously we proceeded, straining our eyes in the dreadful whiteness for any sign of danger. No lift occurred in the clouds, no cessation of the falling snow, and with utmost caution we skirted the big open crevasses and for twenty minutes avoided the thin snow bridges of the covered ones. Then, without a moment's warning, the surface before me opened in a chasm twelve feet long by six feet wide. On the opposite side stood Phillips and Dick Day, on our side were Mr. O'Brien and I and in the centre, out of sight over the broken edge and straining on the rope around my waist, hung Olga, the young girl of the party. As cheerfully as we could, we called out to her and she pluckily replied "I am all right," then with a little break in her voice, "but I hope you'll get me out soon." We assured her hopefully that it would be but the work of a moment. She had fortunately fallen into a kind of niche on the further side of the crevasse and by bending her shoulders forward, she could half sit on a little ledge and so take the strain from the rope supporting her and relieve the tension around her own ribs. There was an overhang above her head, and carefully and slowly the two men on the further side hauled her over it, she using her hands stretched up over her head to push herself from under the overhang. Once she was clear of it, it was a simple matter to draw her up and out.

Just as she emerged and stood upright on her own two feet, as if in token of the relief and relaxation of our own tense nerves, the clouds suddenly lifted and for the space of three minutes permitted us to scan the landscape get our bearings and map out our route. One glance was sufficient for Phillips' keen eyes and we felt that once we could clear this chasm we would reach the smooth

ice of the lower glacier in safety. It was, however, somewhat, of a problem how Mr. O'Brien and I were to join our friends on the opposite side of the six foot crevasse. We tested the snow above and below the opening only to feel our ice axes break through the two-foot snow-bridge.

It did not seem wise to proceed in either direction along the edge of the crevasse, three on one side and two on. the other, for fear it might widen out under the treacherous covering of snow and we all go down together. We chose a spot some six feet above the opening, where the snow-bridge seemed pretty firm, and, lying flat on our stomachs so as to distribute our weight over as great a space as possible, first I, and then Mr. O'Brien, was pulled safely over by Phillips, who had taken a firm stand on the opposite side and braced himself to withstand the strain en the rope, if one of us should break through into the crevasse.

From there on the going was better. Little by little the clouds lifted and through the snow we could distinguish on our left the rocks upon which we had eaten lunch and on our right, but still ahead of us, the cliffs of Mt. Bess. At last we struck the hard ice of the lower glacier, where, amid a mixture of snow and rain, we made good time and were finally off the glacier entirely, and in fifteen minutes more, at 6 :30, were in camp and toasting ourselves before a roaring fire the others had heaped high for us.

On no winter night, when the storm has howled without and I was snug in my own home, have I had a more cosy, warm and comfortable feeling than I had that evening when the five girls and I were going to bed in our big tepee, with a cheery fire burning in the centre, wet clothes hanging from pack saddle ropes, slung between the tepee poles, and the incessant patter of the rain beating upon the canvas above our heads. I suppose it is the danger and the excitement of mountain climbing that helps make it so interesting, and surely it is the contrast from the cold, snowy glaciers, with their treacherous crevasses that makes camp in the friendly timber seem like the most comfortable home on earth.

The next morning we rested in camp, riding in the afternoon to the summit of Bess Pass and on to the shoulder from which Phillips, Miss Jobe and I had climbed Mt. Bess six years before.

We broke camp the next day and travelled up the Smoky, past Wolverine Creek, and on to Moose Pass, where in warm sunshine we camped in an open grove of spruce, near timber line. Just above us a little trail led to the open meadows on the summit of the Pass where we gathered big blue forget-me-nots by the armful.

Another day's travel brought us to Robson Pass where we stayed over a day hoping for the big mountain to clear. But rain beat down incessantly and gave us not a glimpse of the dazzling white knife-edge of the summit.

As we came down through the Valley of a Thousand Falls, we witnessed the biggest snow slide I have ever seen. Plunging down a deep gully from the high cliffs of Whitehorn, it rolled with a crash and a roar far out into the valley, and we from a high open spot on the trail gazed at it spell bound.

On September 1 we bade farewell to our guides on the little platform to the west of Robson Station and at five o'clock boarded the Eastbound Express, and that summer's life on the trail was over.

Athabaska Pass To Tonquin Valley Via Goat And Fraser Rivers

By Donald Phillips

Looking for some new country to route a party over for a long trip last summer, it was decided to go on the B.C. side of the range at Athabaska Pass and work through via Goat River and Fraser River to Tonquin Valley. Personally I had never travelled by this route but knew trappers had been over the most of it with horses at one time or another. From Mr. A. 0. Wheeler I learned that in connection with the work on the Interprovincial Boundary Survey they had gone through from the middle branch of the Whirlpool to the head of Goat River and then over Fraser Pass to Fraser River.[33] This would mean that we would have to retrace our steps a day or more down the Whirlpool which we did not want to do. I had talked the matter over with Geo. Hargreaves of Mt. Rob-son and he said he had been through from Lucerne to Athabaska Pass with Frank Bowen several years before and showed me photographs of all the main features of the country. He said they had been at the head of the middle branch and then went back down the Goat and came over above tree-line to Athabaska Pass. He exhibited a photograph looking across the Athabaska Pass and showing rather rough alplands on the west side of the Whirlpool, and said they travelled along them and came down at the Committee's Punch Bowl. In coming up the Whirlpool I located the place where I understood they had crossed over to the Whirlpool, as there was a low range and what looked like a pass, But from there to the Athabaska Pass along the alplands was pretty rough looking for even Frank Bowen to negotiate. Although it looked impossible to get along there with horses to my practised eye, I still had the memory of that photo and the words of George that they travelled along the alp-lands and came out right at the Punch Bowl.

We camped just over the pass at the foot of a little lake and a very beautiful camp it was, and the following day though it was stormy and the clouds hanging low I decided to look for Bowen's trail. Miss Hinman and her sister volunteered to go along, as they were as interested in this new country as I was myself. We located a route up to tree line without difficulty but there was no sign of a trail or evidence that anyone had ever been up there with horses. We went up over benches and ledges of rock where in places there were caribou trails and finally came out on the summit of a pass with a glacier on the left side coming down from Mt. Brown and the waters flowing off in a westerly direction, evidently into the Goat. I could find no trail down this creek and to go on to the next pass along the alplands was simply impossible, as there was a line of cliffs that only a goat could negotiate, so I made up my mind that if Hargreaves and Bowen came out at the Punch Bowl they had to come by that creek for it was the only possible route.

The party at this time consisted of eleven people with Miss Caroline B. Hinman, Summit, N.J., in charge, who has personally conducted parties pretty well all through the Canadian Rockies and Glacier Park. This was the third time I had outfitted her parties in this section of the country. I had with me as packers Dad Neighbor, Entwistle, Alta., David Moberly and Frank Moberly, Entrance, Alta., Swift (who had just returned from helping to establish trading posts on Coronation Gulf on the Arctic Coast) and Jack Jensen, Innisfail, Alta., as cook. A shift in guides a few days before had deprived me of Adam Joachim the only one who had ever been over the country we were now in. Adam had hunted here before the advent of the railroad and Jasper Park. The Moberly

33 The Interprovincial Boundary Survey went through twice by this route. In 1920 by Canoe Pass, some three miles north of Athabaska Pass to Goat River and in 1921 by the middle branch of Whirlpool River and Whirlpool Pass to Goat River; then over Fraser Pass.—Ed.

Summit Of Canoe Pass. Photo, A.O. Wheeler
Pass Crossed By Phillips' Party From Whirlpool River To Mazama Creek (Goat River).

boys had been over some of the country around the Whirlpool and Fortress Lake but they were too young then to remember much about it. David told us of having gone up the Athabaska once to a point near a goat lick which is above the falls, and then up a creek and over a glacier with their horses, where a colt fell into a crevasse and was rescued with a rope. He said they came out above a big lake in green timber and came home down the Athabaska. This was evidently Fortress Lake so that the Indians had a trail in the early days up the big creek that enters the Athabaska above the falls and crossed over to Fortress Lake on some flat glaciers probably free of snow.

I was interested in the possibility of a trail from Athabaska Pass to Fortress Lake and the second day we were at the pass, although it was still stormy, I decided to have a look over the country in that direction and Mr. 0'Brien went with me. It was all easy enough for a few miles but then a range ran right out to Wood River and ended abruptly. We continued on down the long ridge on the east side of Pacific Creek in hopes that we would get a view of Fortress Lake but were not able to do so. In climbing the last and highest peak on that ridge we got a little stiff work and, as it was sleeting and everything wet and slippery Mr. 0'Brien decided to give it up. I went on to the top but could see very little as it was too cloudy. It may be possible to get a trail through to Fortress Lake from there but it will be rough and a lot of work.

The following day though the weather was bad we broke camp and headed for Goat River. It was then the 25th of August and we had to be in Jasper on the 29th, and had no time to lose. We crossed the summit easy enough and the first mile or so beyond was open but as soon as we got down to tree-line trouble commenced, as the whole valley was covered with broken rock patches, very dangerous for horses to cross. Out of the forty that we had, nearly half of them were new horses not used to mountain work except for the last month. I tried to keep along the tree-line but rock ledges made this impossible so we had to follow near the creek. There were many open slides but between them the growth was very dense and we had to cut our way. There was no trail, and I soon decided that nobody had ever been through there with horses. After a few miles of green timber we came into an open burn with shin-tangle waist high, and soon commenced to go down hill as steep as it was possible to go, which is the case everywhere along the west of the divide in this country. We were soon down into Douglas fir and cedar, and pines that had cones about eight or nine inches long. Finally we hit the bottom and a large glacial creek which comes from part of the glacier that covers the range along the head of Jeffrey Creek and the back of Mt. Brown. Here we found a poor camp ground in thick growth and surrounded by swamps and beaver ponds.

A few miles below there was a fork and up this branch to the right we would have to go to get the right direction, so I decided to go ahead and see what it looked like and whether it would be possible to get through. I reached the forks to find a much larger stream coming in from the right- and one that it looked almost impossible to cross, as it was a raging torrent filled with big water-worn boulders. I followed it upstream some distance to where a log jam on the opposite side and a pile of boulders offered a chance to fell a tree across so as to gain the opposite shore. I nearly had an accident here as the tree landed directly on top of one of the smooth boulders with the limbs in the rushing water. I had just passed the boulder and was still walking towards the log jam when the tree was whipped from under my feet and I landed in the water up to my waist. Had I been in midstream when that happened I should have had a rough ride down the turbulent torrent.

I knew that Frank Bowen had come up the Goat River the year before with a bear hunting party and if it were the Goat his trail must now be on this side of the river. Of course, six horses don't leave much of a trail, but if I could find it I would be sure that this was the Goat, as nobody had ever been up it with horses except Bowen. The trapper always back-packs up these streams in

the winter. I soon struck tracks that were certainly not made by caribou arid there was no moose here. After following it a while without finding any axe marks in the thick places I began to doubt it being a horse trail, so I climbed up the hillside and found a blazed trap line but no trail and went back down hill until I picked up the tracks again, and after a while found a single, branch cut off a jack pine and carried forward and dropped. This was Bowen's trail all right and he was not leaving signs for other hunters to follow into his hunting grounds. I followed these old horse tracks for a mile or two to make sure that they continued up the river, and as it was then raining and getting dark I headed back for camp six or seven miles away.

I found my tree across the river but now a foot under water and a risky crossing, but with a pole placed on the bottom of the upstream side and long enough so that I would not have to shift it I got safely over. When near camp we ran into the horses which were feeding in the sloughs and thick brush and, as it was impossible to see them until you bumped into one, I now took out my little pocket flash light so as not to bump into a horse and get kicked back down the creek a bend or two. I had not used the light up till then as the battery was only good for an hour or so and with the light on you could not keep a course as you could not see outside of the circle of light. When about two hundred yards from camp and with the reflection of the camp fire on the trees to guide me I switched off the light, only flashing it occasionally to see if there was a horse in the way; then the damp peacefulness of the valley was disturbed by a wild halloaing as if someone was in terrible trouble. Mr. O'Brien had seen the flash of my light and was trying to attract me to camp. His tent was on the bank close to the edge of the swift flowing muddy creek and the guides, who were all in bed, thought Mr. O'Brien had fallen into the river and piled out pell-mell to rescue him, to find to their disgust that it was only me returning to camp through the dripping bushes. They took it for granted that as I had already made several miles in the pitchy darkness and wet brush that I could do the rest without assistance and were all in bed again when I stumbled in.

The following morning there were signs of clearing and things looked more cheerful as we started downstream. With the horses we were able to ford back and forward across the stream and so avoided considerable cutting of trail. At the forks the water was high and a crossing looked dangerous. I found a ford about one hundred and fifty feet above the junction of the two streams and though it looked bad the main force of the water was broken by the roughness of the stream bed so that the horses made it safely but the tourists all crossed on a tree that I felled across a narrow place some distance above the forks. All day we continued up that stream through brush, mud and muskegs and about the middle of the afternoon came to a long fence and a camp ground. I decided that this must have been where Bowen had camped for some time hunting bear and had to build the fence to keep his horses from going back, as no horse in its right mind would stay in that valley any longer than it had to. Opposite the camp was the pass (Canoe Pass) that I had originally supposed Bowen and Hargreaves had crossed over, so we forded the river to the other side but there was no sign of a trail and after going a mile crossed back again and camped.

After camp was up and we had lunch I again went ahead, and soon located a blazed trail and fairly well cut out.[34] This I followed to a cabin where a trail came in from upstream, evidently used by the survey parties, and a trail leading up the hill to tree-line brought me out on Fraser Pass. It was the first beautiful piece of country since leaving Athabaska Pass. Goat River has no attractions for man or beast and we only saw a few goats on the hillsides along its valley. But Fraser Pass is a

34 This was the trail cut out by the Interprovincial Boundary Survey party, which crossed from the Whirlpool Valley by Canoe Pass, a fairly easy route. Had Phillips returned down the Whirlpool from Athabaska Pass for three miles to Canoe Pass, he would have avoided all the difficulty he recites and saved considerable time. —Ed.

most beautiful pass, with open rolling alplands. In returning to camp that night I cut straight over the mountains and got down into the timber at dark and to camp at midnight.

The following day was fine and clear. We had a fine view from the summit of Fraser Pass and could see many snow and ice covered mountains back toward Athabaska Pass, and even down the Goat River and between it and Wood River. Here the poor feed and bad going of the last few days began to tell on the new horses and we camped just at tree-line over the pass. One horse was played out or sick from eating poisonous weeds, another was badly cut, and "Dad's" saddle horse, Teddy, the joy of his heart, had got a foot between two boulders and was now going on three legs.

Travel down the Fraser to Geikie Creek was very monotonous, as it is nearly all muskeg and soft trail and the mountains are devoid of snow or ice so far as can be seen from the valley. The Fraser is clear for a long way and then a muddy stream comes in on the left that makes it fairly soupy. We camped a mile above Geikie Creek with no feed for the horses and they went miles back on the trail. Geikie Creek is another bad stream to cross and in high water can only be crossed a few feet from where it enters the Fraser River proper. Here the people again crossed on a tree. The climb up to the ridge to the left of Mts. Barbican and Geikie is a long climb of about three hours but the trail is fair and the view from there after what we had passed through was entrancing and we spent an hour while waiting for some of the tired horses to catch up. We rounded the shoulder at tree-line and headed for Tonquin Pass which was reached after a very long day and with several horses played out and left on the trail to be brought in the next day, their packs having been shifted to the saddle horses. Three days later we pulled into the corrals at Jasper and finished the trip.

The country around Athabaska Pass is beautiful and interesting, and I think it is possible to go with horses around above tree-line to the great alplands and big glaciers and snow-field that lies at the head of Jeffrey Creek,[35] but anyone out for pleasure does not want to follow our route via Goat River. Better go; back down the Whirlpool to Canoe Pass but instead of using the pass go directly over the range towards Fraser Pass, as that is the route I have since learned that Bowen and Hargreaves used. It looks possible to keep to the right at summit of Fraser Pass along alplands, and by climbing one of the lower peaks along that side of the Fraser to get a view of the great icefields at the head of the north branch of the Whirlpool. The trouble with going up the north branch is that you have to back track to the Whirlpool again. The most of the country is interesting but one wants to keep above tree-line as much as possible and keep out of the low valleys particularly on the B.C. side as the going is very bad and you are so shut in that you cannot see your surroundings.

In the 1921-22 issue of the Journal there are two cuts that will illustrate this article very well in the Athabaska Pass section. Plate 1, opposite page 166, shows the pass we went over around the base of Mt. Brown. The line indicating Canoe Pass strikes the ridge almost where Bowen crossed it, and the mountains showing in the distance are the ones on the right hand side of Fraser Pass. The Cut opposite page 164 shows it still more in detail and shows up well the alplands that we first reached from the Athabaska Pass and the rocky ridges we went over to get around the base of Mt. Brown. The large cut on page 158 shows where we came over into Tonquin Valley.

35 Information obtained by the Boundary Survey shows that this can readily be done. The route was travelled on foot by Mr. Wheeler.—Ed.

Mountain Worship

By Allen H. Bent

In those far-off times when cities were unknown, when people lived out-of-doors, it was perfectly natural that pastoral tribes living within sight of the mountains, seeing them constantly, by daylight and starlight, in sunshine, through cloud-rifts, or half veiled in mysterious haze, should become mountain worshippers. When towns were built the mountains were often still in sight, and they became familiar figures of speech. "As the mountains are round about Jerusalem, so the Lord is round about His people."

The mountains of the Holy Land are not of great height. Mt. Nebo, (one of the summits of Pizgah) from which Moses viewed the promised land, and where he was buried, is only 2,643 feet above the ocean, but it is in the region of the Dead Sea, which is nearly 1,300 feet below the surface of the Mediterranean. Mt. Bbal, where Joshua erected his altar, is three or four hundred feet higher. The Mount of Olives is about the same height as Nebo. Mt. Moriah, where was located Solomon's temple, Mt. Carmel, associated with the prophets Elijah and Elisha, Mts. Gilboa, Tabor and Zion are all under two Thousand feet. The mountains of Lebanon, in the southern part of Syria, rise to a little over ten thousand feet. As an Arab poet wrote of this mountain region: '' The winter is upon its head, and at its feet slumbers the summer" Mt. Hermon, also in Syria, is over nine thousand feet. Mt. Sinai (or Horeb), where the law was given to Moses, is in Arabia, and is 4,360 feet. Ararat, where Russia, Turkey and Persia come together, is a mountain of the first magnitude, 17,260 feet in height, and was not ascended by Europeans until 1829.

But Jews and Christians were not alone in their exaltation of mountains. The ancient inhabitants of Central Asia regarded the Himalaya as the dwelling places of their gods. In Kedarnath and Badarinath, 11,000 feet above the sea, in the province of Kumaon and Garhwal surrounded by eternal snows, is the Holy Land of India. Here are the shrines of both Siva and Vishnu, the gods of the Brahman religion and they are visited by thousands of pilgrims every year. Here, too, rises the sacred river of India, Mother Ganga, as they call the Ganges, daughter of King Himalaya and his queen Menaka the air-nymph. The great Hindu epic, the Mahabharata, many times refers to the sacredness of the mountains and connects them with the most ancient traditions of the Indo-Aryan race. Among the snowy peaks to the far north is Siva's throne on Mount Kailasa or Kailas.[36] Farther into the wilderness of peaks is their paradise, Mount Meru, to which Emerson refers in his "Monadnoc."

Buddha, whose followers today are reckoned by hundreds of millions, was born in one of the mountain provinces of northern India, in the sixth century B.C., and it is not surprising that he and his disciples on both sides of the giant Himalaya have been mountain worshippers. An authority on the "Buddhism of Tibet" (L. A. Waddell: says the greatest of the gods of that mysterious country, the defenders of Lamaism, are chiefly the spirits of the larger mountains and deified ghosts of heroes and ancestors. Four of the greatest mountains at the four points of the compass have been deified. Kanchenjunga, one of the highest mountains in the world, was formerly in itself an object of worship. The name means five repositories of the great snows, and these have now become the repositories of gold (the highest peak that is first gilded by the rising sun), silver, gems, grain and holy books. "The worship of this mountain-god, which dates back to long before the Buddhist period, is celebrated with great pomp every year.''

36 Holy Himalaya, by B. Sherman Oakley, Edinburgh, 1905.

Kanchenjunga. Photo, Vittoria Sella

China's sacred mountain, Tai Shan, rising 4,500 feet above the plain in the province of Shan Tung, and a little over 5,000 feet above the sea, claims to be the oldest place of worship in the world. The temple on top was erected by the Buddhists, but a monument beside it records that "On this spot once Confucius stood and felt the smallness of the world below," but even before the days of Confucius, who was born in the province of Shan Tung about 550 B.C., this was a place of worship. The Buddhist god of Tai Shan, named after the mountain itself, is the rain god. This seems very practical, for water is important to that parched land, but we are told that his daughter is now more important than he. She is the Princess of Coloured Clouds, the thousand-handed goddess of the dawn, and it is to her that the temple on the summit is dedicated.[37] And yet some people think the Chinese are an entirely prosaic race.

On the summit of Adam's Peak, 7,400 feet above the sea, in Ceylon, is another far-famed temple to Buddha, covering a depression in the rock that bears some resemblance in shape to a human foot print,—the Holy Foot it is called. Other worshippers claim that the first man after being banished from Eden, was compelled to stand for many centuries here upon one foot.

The highest mountain in Japan has been for centuries an object of worship. "Every child must be plain and simple as the form of the sacred mountain Fuji, and make his mind and body pure as the serenity thereof," wrote one of the bishops of that country. When the native ascends the mountain—it is 12,300 feet in height—he does it as a religious pilgrimage, and both this and On-take, 10,000 feet, have shrines on their summits and rest huts on the sides for the many pilgrims.

Japanese tradition says that Fuji was first ascended in the year 700 by Enno-Shokaku, the founder of the Yamabushi (mountain-soldier) order, though to Robo-Daishi, the founder of the Shingon sect of Buddhism something over a century later, is due the existence of the popular mountain pilgrim clubs. He brought the idea from China, where he had travelled and studied. In both countries the climbers are robed in white. Rev. Walter Weston[38] says "It is not difficult to understand why Fuji makes such a universal appeal to the affection and reverence of an artistic and nature-loving people like the Japanese. There is something wholly friendly and sociable in the way it looks down on the daily labours and the pleasures of the millions of toilers in crowded cities and on the unceasing, ant-like activities of the country-side."

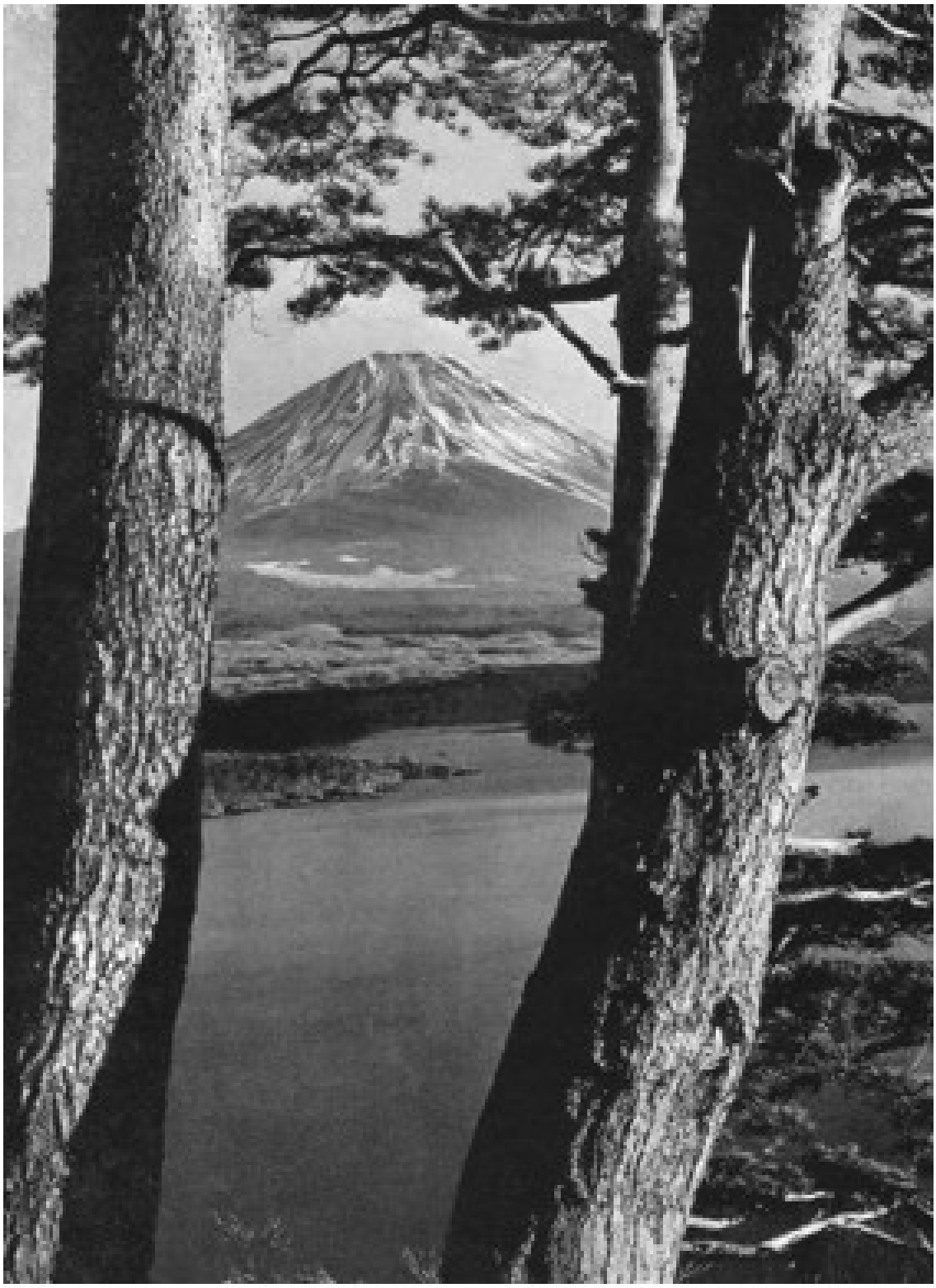
In Korea the Buddhists have picked out the most beautiful spots for their temples. Diamond Peak, a mountain mass thirty-two miles long and two-thirds as broad, reaching a height of six thousand feet, has forty-five monasteries and shrines.

The early religion of the Persians, older than Buddhism and Confucianism, taught that Ormazd, the God of Light, made the summit of the Elbruz Range his abode and that from it stretched the bridge to heaven, and that under the bridge was the abyss, where dwelt Ahriman, the God of Darkness. "From Elbruz the heroic runner, who never dies, the sun, sets out on his course, circles the earth in the highest spheres of heaven, and at evening returns." As Mt. Demavend, the highest of the range, about fifty miles northeast of Teheran, is probably nearly 20,000 feet high, (it has never been accurately measured) it may well have been regarded by the ancients as the home of their chief god. Herodotus said the Persians worshipped on the top of the mountains. Perhaps they did on the lower heights near their old capital, Persepolis.

The decision of another great religious founder is often quoted: "If the mountain will not come to Mohammed, Mohammed will go to the mountain," and that is what we of the twentieth

37 See Sierra Club Bulletin, vol. 10, January, 1917, and National Geographical Magazine, Sept., 1919.

38 "The Playground of the Far East," 1918. See also his "Mountaineering and Exploration in the Japanese Alps," 1896.



Mt. Fuji From Lake Motosu. Photo, Herbert C. Ponting, F.R.G.S.

century should do.

The abode of the gods of Greece was on the highest mountain in that country, Mt. Olympus, which rises to a height of 9,794 feet. From this Zeus fought with his thunder-bolts, for there were rebellions even among gods. In the last of the battles, the Giants tried to storm Olympus by placing a mountain of 5,300 on a mountain of 6,400 feet They did not succeed, but the expression "piling Pelion on Ossa," for these were the mountains, has come down to us through the long centuries. As a result of an earlier storming of Olympus by the Titans, one of the latter, Atlas, was condemned by Zeus to uphold the heavens. His station was considered by some writers to be the Peak of Teneriffe (which reaches a height of 12,182 feet), in the Canary Islands, and by others the Atlas Mountains in Northern Africa. Ajashi, the highest of the latter is 14,600 feet.

Parnassus, a goodly mountain of 8,000 feet, was the home of Apollo and the Muses. At the foot of its cliffs was the Delphic Oracle. Helicon, somewhat lower, was also one of the abiding places of the Muses. Near the top still flows the spring that gushed out at the stroke of the hoof of Pegasus as he leaped toward Heaven.

Greece also had her nymphs of the mountains, as well as of the woods and the waters. These Oreads were very numerous. The most celebrated of them was Echo, who, consumed by love for the beautiful youth Narcissus, a son of the river-god Cephisus, and finding that he did not reciprocate her affection, pined away in ever-increasing grief, until at length her emaciated frame was changed into rock and nothing but her voice remained.

"Sweet Echo, sweetest nymph, that liv'st unseen

Within thy aery shell," wrote Milton. Aphrodite avenged this injury to her sex on Narcissus, by causing him to fall in love with his own shadow that he saw reflected in the water when he bent down to drink from a spring on one of his hunting trips on Mount Helicon. The object of his desires being unattainable, he, too, pined away from grief, and the flower named after him has ever since been an emblem of heartless beauty.

The Cretans claimed that Zeus was born in a cave on Mt. Ida, the highest mountain of their island, 8,100 feet, and a very ancient altar of colossal size has been discovered in front of the cave carved out of rock. The bronze relics found in the cave date from the ninth century B.C. The tomb of Zeus is on their Mt. Juktas, say the Cretans.[39]

In the Anatolian Range in Asia Minor is another Mt. Ida, where Paris was once a shepherd and whither Aeneas fled after the fall of Troy. This, the temporary abiding place of Zeus during the Trojan war, is mentioned many times in the Iliad.

In Egypt certain cults believed the vault of heaven was supported by two mountains. '' Out of one mountain came the sun every morning, and into the other he entered every evening. The mountain of sunrise was called Bakhau, and the mountain of sunset Manu. [40]

In the Middle Ages many monasteries were built on well-nigh inaccessible mountain tops. This may have been partly for safety, but I am sure the desire to live in a higher and purer world had something to do with the location. There were and are many on Mt. Athos, whose summit is 6,350 feet above the Aegean Sea.

Italy had many monasteries in the Apennines, in the region from which one of the most famous of modern mountain climbers takes his title, the Abruzzi, where is situated the highest peak on the mainland of Italy, Monte Corno, 9,815 feet. Francis of Assisi was born among these heights, and so, too, was his friend and disciple, Thomas of Celano, author of the old Latin hymn, Dies Irae,

39 Myths of Crete, by Donald A. Mackenzie.

40 The Gods of the Egyptians, by E. Wallis Budge, vol. 1.

which may have been inspired by the wild, rocky scenery of these very mountains.

In the year 1358 a chapel was built close to the top of the Roche Melon, near the Mont Cenis Pass, in the Savoy Alps, at a height of 11,600 feet. For many generations there has been a regular pilgrimage to this on the 5th of August, the festival of Our Lady of the Snows. For two centuries or more the monarchs of the House of Savoy have generally taken part in this. Some distance to the west of this is another peak, Mont Thabor, 10,440 feet, crowned by a chapel, though no one knows just when it was built.

The Monastery of Montserrat or Montsagrat, the most celebrated of the Spanish convents, was founded in the year 880. It is about two-thirds of the way up on the mountain which rises in solitary grandeur from the plain of Catalonia to a height of 4,070 feet.

For more than a thousand years the religious orders have maintained hospices, each with a chapel, on the alpine passes, two of which bear the names of saints, Bernard of Menthon, and Gotthard, Bishop of Hildesheim. The refuge on the Great St. Bernard, 8,111 feet above the sea, was there as early as the year 859, and that on the Septimer Pass, 7,582 feet, is still older.

In America, both North and South, the so called savage, a name that originally meant belonging to the forest or wilderness, looked to the mountains for help.[41]

Thus it will be seen that through all the ages and in nearly every part of the world mountains have been objects of worship and a power for good.

Small Mammals Of The Canadian Rockies

By D. J. M. McGeary

Animal life in our Canadian Mountain Parks is carefully protected by Government ordinances constituting the Park areas a game preserve. Fortunately the restrictions on the use of the gun do not apply to the use of the camera. The accompanying photographs indicate something of the bag which sportsmen may obtain by the latter method.

My attention was first called to the possibilities of this method of hunting on an occasion when I was accompanied, if not pursued, most of the way up Wenkchemna Pass by a very fine specimen of hoary or whistling marmot. This grayish brown mountain animal was so persistent that in the course of his investigations he finally drew blood from my finger. His curiosity further manifested itself in the continuous nervous twitching of his nose, while his sharp, protruding teeth gave an appearance of ferocity which neither his size nor friendly disposition supported.

It was not until two later seasons that other occasions presented themselves for further study. One summer afternoon, while enjoying the fine scenery en route to Lake McArthur, a sudden shrill, human-like whistle startled the party of which I was a member. Recognizing the sentinel's warning, we very easily located the marmot responsible for the signal perched on one of the large rocks of the district, and at the same time saw others seeking places of safety. Having warned the others away, he inconsistently approached nearer himself and—if I may again be allowed to use, in relation to photography, language originally applicable in the field of the hunter—soon came into the firing line and six close-up shots were the result. The absence of man and freedom from being hunted have resulted on the part of many of the animals in a very charming confidence and friendliness which give the very finest opportunity to the photographer for sport and study.

My luckiest day in this respect was in the Asulkan Valley on an occasion when a whole

41 See PP '' The Indians and the Mountains,'' in Appalachia, volume 13. 257-271, June, 1915.

family of marmots joined me in disposing of the good lunch with which I was provided. Having greeted me with the usual warning or whistle, the head of the family soon displayed an inclination to join in tasting the good things placed on a rock for his inspection. Soon his mate and their family of three little ones manifested the same desire and all five seemed to agree with myself as to the quality of the food. Soon my big friend was sufficiently free from timidity to come closer and receive the second course from my hand. We all became such good friends that when the time came to think of the future it was necessary to move away a little in order to take aim and pull the trigger (of the camera).

My interest in the small animal life of the Rockies having been awakened, I tried in the summers of 1921 and 1922 to extend my study of it to other species and succeeded in obtaining photographs of the pika or little chief hare, the mountain squirrel and the Parry marmot.[42]

The pika, sometimes called haymaker, also little chief hare, is rather a rare animal to see and is even more difficult to photograph. The accompanying picture was obtained in the rocky part of the McArthur Pass district just, adjoining the green meadows. The presence of the animal was at first disclosed by a shrill cry, the origin of which was for a time very difficult to identify. After carefully waiting and watching there was spied a small, bright eyed animal about the size of a half grown baby rabbit and resembling the latter except that the pika had round ears as is very well indicated in the picture. This wise little banker was standing in the doorway of his underground barn and was eying us very carefully. As we approached he disappeared into his hole in the rocks and probably had a look at his accumulation of hay which he was storing up for the winter and for the rainy days. This hay he is past master of making and for that purpose uses the grasses, flower stems and other vegetation which he cuts off and dries in the sunlight on the warm rocks before he stores his harvest. By carefully waiting and using a long-focus lens on his next appearance this evasive subject was claimed as part of the day's bag.

An interesting study was obtained of the mountain squirrel at Moose Lodge, and again at Fishing Camp, This fine little creature is very frequently found near camps or places where food has been dropped. At the former place we discarded some sandwiches and ere we left were treated to the pleasure of seeing our friend start his campaign of thrift, as he carried away for future use the entire lot, piece by piece. Close by the tent at Fishing Camp this reddish little creature was studied and photographed while carrying on his activities. His quick, chirpy manner endears him to all to whom small animal life appeals.

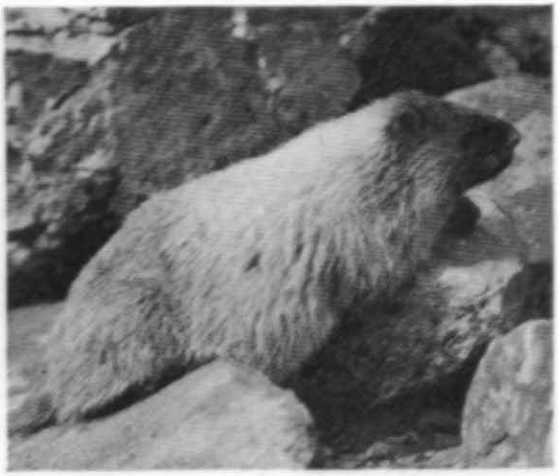
The upper part of the Spray Valley as one nears Palliser Pass and also the meadows on the summit of the Pass are very thickly populated by the cunning little Parry marmot. This busy inhabitant of the ground is hard to approach beyond a certain point and is therefore seldom photographed at close range. It is very alert and at the slightest sound stands erect on its hind legs[43] and watches the approaching source of danger, then disappears into its hole close by. A general favourite resting or basking place seems to be on the fallen logs, and here a long-focus lens will help the sportsman secure a better specimen of this small but interesting animal.

To any one who will take the time to linger in the places inhabited by the small life of the mountains I can assure a very rich reward. This promise is made not only to the camera enthusiast and to the student of natural history but also to the casual observer. The mountains are full of appeal of the most varied kind. The visitor to them is not limited to climbing, exploring or viewing the grand and ever interesting places of the everlasting hills, however splendid the rewards for

42 So-called Mountain Gopher.—Ed. 15

43 A local name is the "Tent-peg" gopher, owing to the resemblance when standing erect.—Ed.

No. 1



No. 2

No. 3

No. 4

No. 5

No. 6

No. 1 - Hoary Marmot or Whistler
No. 2 - Hoary Marmot or Whistler
No. 3 - Little Chief Hare or Pika
No. 4 - Red Squirrel
Nos. 5 and 6 - Parry Marmot or Mountain Gopher
Photos, D. J. McGeary

Young Rocky Mountain Goat. Photo, J. M. Thorington

Beaver Swimming in Lake Adolphus. Photo, H. F. Lambart

such activities may be. In his spare moments or even as a subject worthy in itself of a season's attention, he will find that the small animals of the Alpine districts constitute a world of interest in themselves. If he be a camera enthusiast the quite different problems involved in photographing wild living things will be an excellent foil to his search for the finer views of the more evident and less elusive peaks.

Note by A. S. Sibbald.

The keynote of the article is its stressing of the fact of the variety and contrast of the appeals made by outdoor life in the mountains. No mountain lover would agree that the word lifeless could properly be applied to the peaks themselves. But their vitality is of a kind different from that of the animal life which finds sanctuary amongst them. One of the most charming experiences of the trail is the recurrent glimpses of small and shy but usually friendly forms of marmot and squirrel and other rock or wood denizens. They redeem the Rockies from the European climbers' occasional charge that our ranges, peaks and valleys are a solitude.

To the vanity of the climber proper there comes an occasional disturbance from this source. The writer was once a member of a party which undertook a guideless climb of Mt. Rogers in the Selkirks. We had a highly pleasing day on the rock ridge route between the two glaciers and reached the summit after three in the afternoon. We thought with some elation of the interminable series of cracks and ledges successfully surmounted between ourselves and the lower world. But this complacency with ourselves yielded to admiration for another when on the very summit boulder at 10,536 feet altitude we found a squirrel whose absurd frisking and chirruping spoke of as keen a climber's joy as our own. The Swiss guide, Ernest Feuz, has since told me that he has had a similar experience.

The Alpinist's sport includes more than climbing. By climbing, it is true, he gives expression to himself and to the buoyancy and energy which the mountains bring him. But there is a receptive side to the experience as well. Sun, rain, wind and cloud, flower, rock, butterfly and wild animal—all contribute their part of Nature's message and the lover of Nature in one aspect finds himself more and more attuned to admire her, sooner or later, in all.

Horse Thief Creek And The Lake Op The Hanging Glaciers

By Cora Johnstone Best.

There isn't a mountain trip that isn't worth while. There isn't a mountain trip that isn't a succession of sunshine and shadow. One day I'll decide that the trip to the Lake of the Hanging Glaciers was undiluted sunshine and worth ten times the slight discomforts we endured. On another day I'll decide quite emphatically that no scenery on earth, be it the distilled handiwork of God Himself could repay the torture of soul endured by our party on this memorable trip. Let me quote from my diary: "Monday, September 4th,, eighteen mile post. "We got up at five. The packing took some time and then it was discovered that Old Bill had gone. Tom (the camp boy) and Harmon looked everywhere but Bill was undoubtedly gone. Chere (Mrs. Shippam) and I took our horses and went out and Bill found us two miles away. We got back to camp and had lunch, as it was time, and got started at one." Therein lies the seed of my decision that no trip is worth some things that one has to endure.

Our trail led up the main fork of Horse Thief Creek. The first night we were to camp at a place the guide said was the best we could make so late in the day. He spoke about a bad ford we

would have to cross to get to this camping ground and emphasized the necessity of making it before dark. Where McDonald Creek flows into Horse Thief we met an old miner who was coming into town for the winter. He told us about a bear that had been bothering him, and asked us to hunt it up and interview it and see if we couldn't convince it that it wasn't doing the right thing by him. North Pork comes in about two miles above McDonald Creek and to the right. Rain began falling and we were all pretty wet when we finally came to the fording place. Here, much to our joy, we found a strong, new bridge and no fording was necessary. The trail to South Fork turned off right at the bridge.

We made camp in the rain but everyone was cheerful. We had a couple of chickens with us and when Conrad started to get dinner there arose a mighty discussion between Harmon and myself as to how the chicken should be cooked. I held out for fricassee chicken with dumplings,—nothing short of dumplings could soothe my tortured soul after a day—it had run into a day even though we had started at one—behind Old Bill. Harmon held out for "mulligan" and claimed the extra advantage of quantity. Harmon is the mulliganist person I have ever had in camp. The cook settled the discussion by making mulligan with dumplings in it.

'' Tuesday, September 5th. Thought it was still raining but it was just dead pine needles falling on the tent. Old Bill was gone. Tom came back with him at two o 'clock.'' After about two hours riding, or about the third time Old Bill fell into trouble, we came out of the deep woods onto a steep shingle slide. From here we could see a beautiful waterfall in the distance. We left the pack train and our saddle horses and climbed down for pictures. The falls were well worth the nasty scramble we had to make both in going and coming. Three great cascades tumbling abruptly down from between two high, rocky promontories.

From the shingle slide we plunged again into deep woods to emerge later on a lovely plateau. Here we had a grand display of Old Bill's wildest work. That horse would never follow another horse if he could avoid it and whenever there was the slightest opportunity offered him in choice of ways to run he usually tried them all. The five of us finally headed him into line. If Old Bill would have used half the energy to pack his load that he used in running wild, he would have been a good pack horse instead of a thorn in our sides.

There is a very good trail leading up the gorge, which is heavily wooded on all sides. Twenty-one switchbacks make the climb comparatively easy, and glimpses of waterfalls and cascades break the monotony. It was dark, except for the moon, when we reached camp. Our tents were pitched at the rim of the valley in the shelter of big Lyall's larches which cast weird shadows on the new snow. A soft golden radiance shone about us and lacy clouds tumbled over the surrounding snow-shrouded peaks, casting purple shadows on the slopes.

The next morning we got settled in camp. In the afternoon we all went up to the Lake of the Hanging Glaciers. Such a scene of wild grandeur; such cold majestic beauty; peak after peak glittering in the afternoon sun, eight great hanging glaciers in a semi-circle; the lake, itself a blue gem in setting of beaten silver, juggled odd shaped icebergs that turned and twisted in constant movement, offering a kaleidoscopic array of prismatic colours from the palest mauve shade to deepest marine blue. We stood and gazed spellbound! We gazed until the setting sun turned the lake into splashing blood, and then concluded the display by pulling purple streamers down from the peaks and across the surface of the water. Such was our introduction to this wonder lake.

On the way back to camp we talked about the falls we had photographed the day before and discussed names for them, also for the falls just below the lake that spread themselves over the rocks like a huge fan with underlying colour of blue-green rock. '' Trinity Falls for the one yes-

terday and Peacock Falls for the one today—both very appropriate names." And it was agreed.

The next day Mrs. Shippam, Conrad and I scrambled all over a small mountain, no name, and we took some fine views and panoramas in moving pictures that included the distant Lake of the Hanging Glaciers, Dragon Tail Glacier on the main branch of Horse Thief Creek and around to the mountain we were on. These all turned out well. In the afternoon Conrad went off somewhere to hunt for grizzly bears, and Mrs. Shippam and I went on a little expedition of our own when we were caught in a bad blizzard which lasted for several hours. We took refuge in a small rock cavern for about an hour during the hardest part of the storm.

That night I awoke from a sound sleep with the echo of thunder in my ears. Our little tent was tied to the tallest tree in the group and this tree, having very thick, heavily needled branches, had become the parking place for all objects that we wished to protect somewhat from the elements. Sure enough, there was a real, honest-to-goodness thunder storm in progress and it was just above our heads. My mind went over a few details: "At least seven thousand feet up, tallest tree around here, three rifles, three ice axes, two wood axes, one moving picture tripod, three loaded automatics and thirty-six sticks of dynamite hanging on a branch not over four feet from our heads, all together under the one tallest tree in the"—"Chere, Chere, wake up, don't you hear the storm?" "Yes, what of it, we're in the tent and it doesn't leak." My last conscious picture as I dropped off to sleep was a pillow made of violets on which was traced in white tulips, "rest in pieces."

The weather warmed up somewhat after this storm and most of the snow melted. In a couple of days we began having a little blue sky. We were waiting for enough sun to get pictures. We had picked out several "locations" so that no time would be lost, but despite this much time was lost when the sun began to shine because a '' location" was lost. This particular "location" was a little upland meadow not over fifty yards across, the "approach" shadowed by a magnificent Lyall 's larch that was just made for pictures. We were to come through this "approach" up a gentle rise to a large rock where we were to stop and register surprise and delight over our first glimpse of the lake, then continue on down another slope to some small larch trees overlooking the lake. This should have been a fine scene, but it never showed up in the finals, no doubt due to some temperamental streak in the camera.

There hadn't been much said about it but those thirty-six sticks of dynamite had been carried all the way from Windermere on one of the horses (not Old Bill) to assist Nature in the final act of bringing forth a natural phenomenon. The act was to be called '' The Birth of an Iceberg,'' in case it was an iceberg. Of course, the title could be changed in case it happened to be a monstrosity. It seems that when Freeman's party went up to the lake they had the same idea. Whether Harmon had purloined the act, after the Freeman failure, or whether the idea was common property I don't know, but I heard Harmon and Conrad discussing the possibilities. "Now" said Harmon, "you remember that when they touched off the dynamite, it made a lot of noise but that was all there was to it; there wasn't a chunk of ice big enough to photograph. And you remember that whale of an avalanche that came down from the jar of the explosion? It came right off that peak there and I'm going to focus on that same peak and I'm sure to get what they missed.'' Harmon wagged his head and we all stood around with satisfied smiles on our faces.

The next morning broke just right. We were up early and in feverish haste to be off to the scene of action. Tom was sent for a horse and after a long while he came back with Old Bill, as he was the only one to be caught. The tripod, and camera boxes were loaded and we started for the lake. The exact spot for Harmon's moving picture camera had been picked out for days, also the exact spots for Mrs. Shippam's moving picture, and for each of their two still cameras. The whole

No. 1

No. 2

No. 3

1. Lake Of The Hanging Glaciers.
2. The Ice Wall Of The Glacier.
3. Baby Icebergs Floating To And Fro.
Photos, Audrey F. Shippam

scene had been gone over carefully so there would be nothing left undone that ought to be done.

Conrad went over and dug a hole in the ice and placed his dynamite, tamped it down and lighted the fuse. When he came back he remarked that something should come loose as there were seventeen sticks about to let go. Harmon took a last anxious look into the finder,—yes, the exact peak, and it was rounded high with new snow. He mopped his face and looked along the line to see if everything was ready. It was. This would be a grand success, undoubtedly. The earth shook; the air turned purple; Mother Earth agonized, and a few pounds of ice tinkled off into the water as the smoke drifted away. But, of course, that was understood. We were waiting for the aftermath, the mighty avalanche we were sure to get.

Now, when Old Bill had been unloaded he had strolled off to browse on some tufts of green and no one had given him a second thought. When the first report of the discharge took place, Old Bill started a little charge of his own. What mattered it to him if the cameras were in his line of advance? He came down the stretch hitting on all four, his mane flying, his nostrils dilated and flaming, his eyes holding the fire of battle. He hit Harmon first! Down went the camera and Old Bill walked up the spine of the vanquished photographer, hit the second, third and fourth cameras with sickening precision and careered off down the valley. And then it happened! The whole top of the mountain eased off a bit, toppled and crashed to the glacier below in the mightiest of the mighty of avalanches.

The most eloquently profane men never use words. This remark is not apropos of anyone in particular,—I merely mention it as an observation of mine. After we had finished making out the casualty list, we collected our stuff and climbed or rather scrambled around the shore to the left of the lake where some fine pictures were procured by both Mrs. Shippam and Mr. Harmon. We went out on the big glacier over to the extreme right where some more good stuff was shot. These pictures all turned out well. Here one got a very fine view of the great ice wall that rises at least a hundred feet sheer up from the water. No more awe inspiring sight could be imagined, and this alone is well worth the trip.

From a scenic standpoint I think that the valley of the Lake of the Hanging Glaciers is far more beautiful than the other valleys. From a climbing standpoint I think it is surpassed by both the valley where the main branch of Horse Thief Creek has its source and by the valley of the South Fork; and, of the two, I think the South Fork has more to offer. There are many unclimbed peaks and several that look as though they would make good graduating climbs. We broke camp and moved down to Horse Thief Creek on September 14th, from whence we made several trips to the ice caves. Here again, is a sight that is alone worth the trip. The big cave is all of three hundred yards long. Its arched dome, where winds have kept a constant melting process going on is polished jade-green. The ice is cupped out in even pattern over the whole of the surface. We explored to the back entrance, far up on the glacier.

On the way to the cave we passed another lovely waterfall. We could see the course of the stream where it had chiselled its way through the rocks foaming and leaping down the mountain side finally to push its burden over the brink where it bust into a thousand jewelled fragments that sprang to meet the sun.

The next day was warm and clear so we started out exploring. We climbed up at the side of the falls, which we had decided to call Crystal Bowl Falls, and worked our way along the steep sides of the canyon for a couple of hours. Far above us we could see the stream like a silver thread winding up into the clouds where black peaked rocks stood out in silhouette. We could see that our canyon broadened out, but to protect the secrets of the high places, there had been chiselled out a

sheer rock wall. It was necessary to climb this in order to go on. When we climbed over the rim we found ourselves rather abruptly ushered into a fresh upland meadow where we had a feast of ripe strawberries. (This was September 16th). From the drop off into the canyon proper, there was a convergence of small streams coming from several different valleys. One of these streams we followed. The small larches were turning yellow and the slopes were a riot of fall colour. We left this stream for a still smaller one that came in farther up the valley where we found some rather fine rock formations. Eventually, we came out on a spur of the mountain that gave us a wonderful view. I understand that it was from this point that the Lake of the Hanging Glaciers was discovered.

We worked our way down the opposite mountain and, after descending several steep valleys, we came to our trail of two weeks before and went back to camp that way. The next day we moved camp down to the mouth of the South Fork. That night we were entertained by Mr. Waterman's singing porcupine. He must have been something of a wandering minstrel, and we urged him to keep on wandering, much to his disgust. The following day we were to go to the source of the South Fork. Tom went up to get the horses and, as usual, Old Bill started something by breaking through the barriers on the trail back up Horse Thief Creek and a couple of the horses followed him. It took an extra hour or two before they could be headed off and brought back. And, as though that were not enough for one day, he started blazing his own trail on the way up the South Fork, fell down and couldn't get up, and our combined efforts couldn't make him. He kept sliding and sliding on down hill until he became wedged between two immovable objects. Here we were forced to unpack him. Conrad thought he had a broken leg and would have to be shot but, after his load was removed and he made up his mind, he got to his feet none the worse for his experience. That was just the trouble with Old Bill, someone always helped him out of his scrapes and he was never seriously hurt, so why worry?

On the way up there was a deep, rock-walled canyon something like Elko Canyon in southern B.C., only smaller. We stopped and climbed around in it for a while and Harmon shot a lot of film, but none of it turned out well—not enough light, I think. At the top of the canyon were the usual falls, pretty but not extraordinary.

We followed the South Fork up through a beautiful everchanging wonderland. High mountains all around us, brilliant upland meadows sprinkled with fall flowers, glimpses up narrow valleys where peeps at glaciers tempted us to explore; on, on we rode until we halted right under the shadow of Tiger Claw Glacier. We pitched camp on the boulder strewn bottoms with very little of the right kind of stuff to brush our beds.

On September 20th, Mrs. Shippam and I took our horses and spent the day up one of the valleys that had beckoned to us on the way. We rode as far as we could, left the horses and did quite a lot of climbing. The stream tumbled down a canyon for some four hundred yards. The walls were perpendicular, so we had to work our way well back from the rim of the canyon. We kept as near to the stream as we could and, after a couple of hours of hard scrambling, the stream bed widened out and we could follow it better, although it was really hard going. The stream was deep and very swift. We had to make wide detours away from the bank many times and when we were forced to cross, which happened several times, we always came off second best, wet to our knees. Up in this valley we came upon another ice cave. It was larger than the one already described but not so pretty. We went into it and sloshed our way up a steep slope. After a while we saw an opening on the side. We worked our way over to it and were surprised, when coming into the daylight, to find ourselves well up on a cliff. The shelf we struck ran around a shoulder of the mountain and offered narrow but good going. In this way we worked right out on to the glacier.

We were disappointed; the glacier was small, comparing it with just ordinary ones, and was very dirty from falling rock and dust. It was a queer glacier though. Near what we judged to be the centre it was caved in and was a perfect tumble of blocks of ice. There were quite a number of large "saw-mills" which would have caused us much concern if we hadn't been acquainted with them and their snoring, buzzing, snorting ways. The valley from below holds forth many promises but is not worth half the trouble we had in following it up.

Far up in a valley to the extreme left of Tiger Claw Glacier is the cabin where we were to interview the bear for the old miner. The cabin itself was very well built. The interior was fitted up with log furniture that spoke volumes for the taste of the man who had done the work. The bunks were fitted with hewn benches around the two sides and places were made at the heads of the bunks for books, papers and lamp or candle sticks. He was evidently fond of reading after he had retired.

The plateau on which the cabin was located was a succession of grassy swales between settings of massive pine trees, a spot that could quite reconcile one to becoming a miner, if that were the necessary calling for residence in such an Elysium.

There had been some discussion about the peaks all around camp, some of which Conrad said had not been, climbed. We had been eager to do at least one first ascent of a major peak while on the trip, but Harmon had told us when he joined our party, that this was his second trip after the picture of a grizzly bear and he was more than anxious to get it. Mrs. Shippam and I took keen pleasure in exploring the mountains alone and so released Conrad for practically all of his time to hunt. However, there were a couple of peaks we thought we should like to try. One of these Conrad said was over eleven thousand feet and the better climb of the two, so we decided on that for the first one.

On September 25th, we made a start at 7:15. We walked the knife-like edge of the terminal moraine of Tiger Claw Glacier until we came to the rock wall, which we climbed. At the top of this wall we turned to the left and climbed around the tongue of another glacier, unnamed, and found ourselves in a patch of long grasses and fall flowers, and a large flock of ptarmigan. At ten o'clock we were at the top of the first little peak. This peak had a sharp arête, very steep on both sides; in fact it dropped straight off on one side to the glacier below for the whole of its length. We roped before going out onto the big glacier. The ice work was not particularly interesting, although there were some spectacular formations in ice and snow and great caverns hung with icicles. On the snow ridge the wind blew the new snow in such a gale that it reminded one of an Alberta blizzard. We came out onto rocks where we did a little easy climbing and reached the top, a fairly flat stony peak that dropped sheer off on three and a half sides, something like Assiniboine. From the top we could get a fine view of the Toby Creek Valley which lay just below us, also of peak after peak, all offering something new and interesting to please the eye and lure the climber.

As our peak had no name, we, in nothing but fun, gave it the conglomerate name of Conforjohn. Leaving our record in a well-built cairn at the top we made our way down the same route we had taken up, detouring just enough to climb an interesting bit of rock and reaching camp about 6:30. This time should be shortened to about nine hours at the most. We had spent a lot of time in building the cairn and in taking moving pictures at the top. The pictures all turned out fine.

Right under Tiger Claw Glacier there is another ice cave that is large enough to ride the horses all around in. It wasn't as deep as the other two but it would have been quite a find if we hadn't seen the others. We climbed around on Tiger Claw and took a lot of pictures, both movies

and stills, and I think that most of them turned out well.

On September 27th, we were up at 6:00 and started packing. It took a long time to find Old Bill. He had what one might term protective colouring. When he stood still, and he was an adept at that particular pastime, he looked for all the world like the red-brown, scraggly stump of a big pine. We had heard Harmon dickering with Conrad to take Old Bill out and shoot him as that might perhaps bring the coveted grizzly around but it was decided after much discussion that Old Bill would have to be kept, until after this trip anyway, as the other horses had all they could manage. About half-past ten Old Bill was found. It was after eleven when we got started.

The plan was to go up on the North Fork in hope of finding the grizzlies, but Mrs. Shippam and I decided that we would go on to Windermere as it was getting late in the season. On the way down nothing much happened except Old Bill decided he would rather be shot than carry the load back again, so he started another revolution. He first stood stock still to think out his line of action and when I came up from behind and hit him with a small switch, he first looked reproachfully at me and then, divining that we wanted something in the moving picture line, he started the exhibition by humping up in the middle. Then he careered around a nice sandy stretch on the bottoms, jumping and bucking in a way to bring tears to one's eyes, until his load was neatly parked between his front and hind legs. Perhaps he was trying to show us that the best way to carry a load down hill was to sling it from underneath.

After straightening Old Bill out in both mind and pack, we discovered that two of the other horses had wandered off and had to be rounded up. We stopped and Harmon took a fording picture, which turned out good, and with several small delays it was four o 'clock when we reached the mouth of the North Fork. We made a fire and had some tea and a bite to eat. It had been raining and we were chilled to the bone.

At 4:30 we bade good-bye to Harmon and Conrad, who were still on the trail of the grizzly which they never found, and Tom, Mrs. Shippam and I started on the twenty-six mile ride to Wilmer where we arrived at 12:00. As our watches had been set back that meant nearly 2:00, Wilmer time. There isn't a decent place to stop at Wilmer,—don't try it. We found a man who was kind enough to take us over to Windermere where there is an excellent hotel. There was no one about at that time in the morning, (4:00) so we hunted up a room and went to bed.

In my mind's eye, I can see the white tents of the Canadian Alpine Club pitched in the usual picturesque array under the towering peaks near the Lake of the Hanging Glaciers or in the lovely meadows below Tiger Claw glacier under the shadow of Farnham Tower. I hope to be one of the members of that hardy band of pioneers who make the first trek up Horse Thief Creek.

The trip is different from any I have ever taken. It is full of interest and possibilities and will be an easy problem to solve for the managers after trips like Assiniboine and Palliser. The eighteen mile post could be reached by automobile and the whole trip in should not take over two days from Windermere if an early start is made, so there would have to be but one over-night camp on the way. I am told that there are many unclimbed peaks and there are certainly plenty of mountains that offer a variety of climbing. The scenery is ever changing and full of interest; in fact one is apt to loiter too long on the way, tempted by the possibilities one sees on all sides.

Nietzsche says: "Those who can bear all things can dare all things." Under any circumstances a trip to the Lake of the Hanging Glaciers is worth whatever falls to your lot short of death.

Peaks At The Head Of Pitt River

By W. A. D. Munday.

Whether or not mountain heights are measured in five figures is not always a fair indication of their alpine characteristics and this is especially true of some sections of the Coast Range of British Columbia where an 8,000-foot mountain may possess all the glacial features of 10,000-foot peaks in the same latitude in the Rockies.

Persistent stormy weather in Mt. Garibaldi Park in August, 1922, forced my wife and myself to abandon our hopes of a back-packing trip for 15 miles above timber-line to the neighbourhood of an imposing black peak eastward of Mt. Garibaldi Lake where we encamped with the British Columbia Mountaineering Club. However, the weather finally cleared briefly and we joined forces with Mr. Neal M. Carter, H. O'Connor and Clausen Thompson, B.C.M.C. members. Together we decided to make a one-day trip across the headwaters of the Pitt river, a tributary of the Fraser, and a stream of much greater size than the area of its watershed might suggest to those unfamiliar with the extensive glacial regions in which it rises.

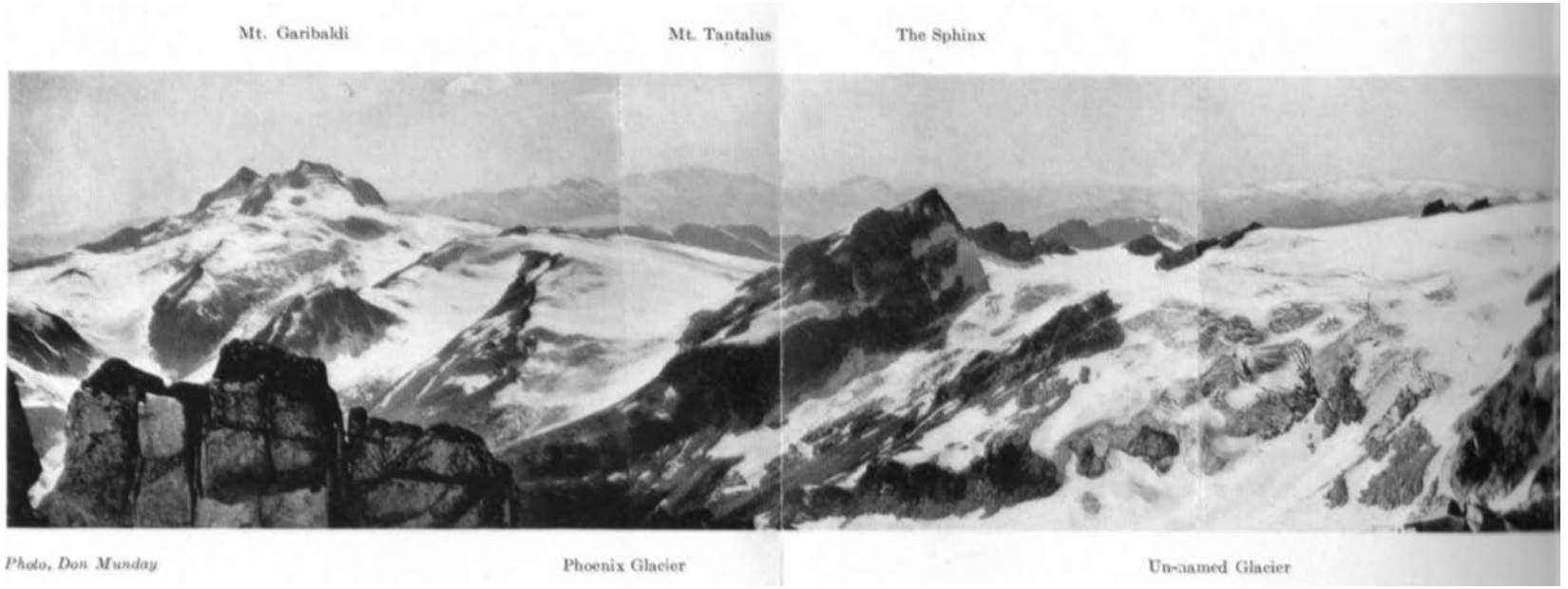
As a big party was scheduled to climb Mt. Garibaldi, both boats were in use, and it was not until nearly 8 a.m. that we landed on the terminal moraine of Sentinel Glacier, half a mile from camp. We climbed the glacier eastward to Pitt Pass, one of the three glacial passes at the head of the Pitt. Then we mounted the northern slope to Sphinx Pass at the western base of the peak of that name. Two and a half miles across the neve of Sphinx Glacier brought us to the rock ridge south of Copper Peak at an elevation of 7,900 feet. (Garibaldi Lake is 4,600 ft.) From here for the first time we got a partial view of our goal. Beyond Gray Pass were Crosscut Ridge and three higher unnamed peaks.

In the descent to the pass we made a traverse of an exceedingly steep ice-slope to negotiate the bergschrund. A series of huge crevasses below finally forced us off the glacier altogether; the rocks on the south proved simple enough. Gray Glacier flows northward from the pass. In comparatively recent times it must have met a glacier in another branch of the valley leading to Cheakamus Lake; the snouts are only a short distance apart. The glacier on the south side of the pass drains to the Pitt, being the furthest extension of the valley, although the main volume of water comes from Pitt Glacier which is formed by the reunion of two northeastern ice-streams from Mt. Garibaldi.

From the pass our climb began. It was now 1:30 p.m. The heat and light were intense, nearly three-quarters of the surrounding country being covered with snow and ice. The neve ahead of us was not unduly difficult. The pinkish granite of the summit ridge was much shattered. In the light of overseas experience, Thompson and I saw something appropriate in the name Parapet Peak. Visibility was perfect, and we longed for time to push north and east among unexplored, attractive glaciers and heights.

Southward lay a slightly higher peak: to descend to the col between seemed reasonably simple. We started down at 3:15. The arête quickly developed into a palisade of smooth slabs, not utterly impossible but plainly impracticable. The neve was gashed badly and, in addition, possessed a schrund all along the base of the arête; into this chasm we descended to outflank a crevasse. Got out with some trouble to a ledge under an overhanging part of the cliff, and from a kneeling position on this narrow shelf had to leap across to a lip of snow. To perform the curious manoeuvre packs and ice-axes had to be hoisted with the rope.

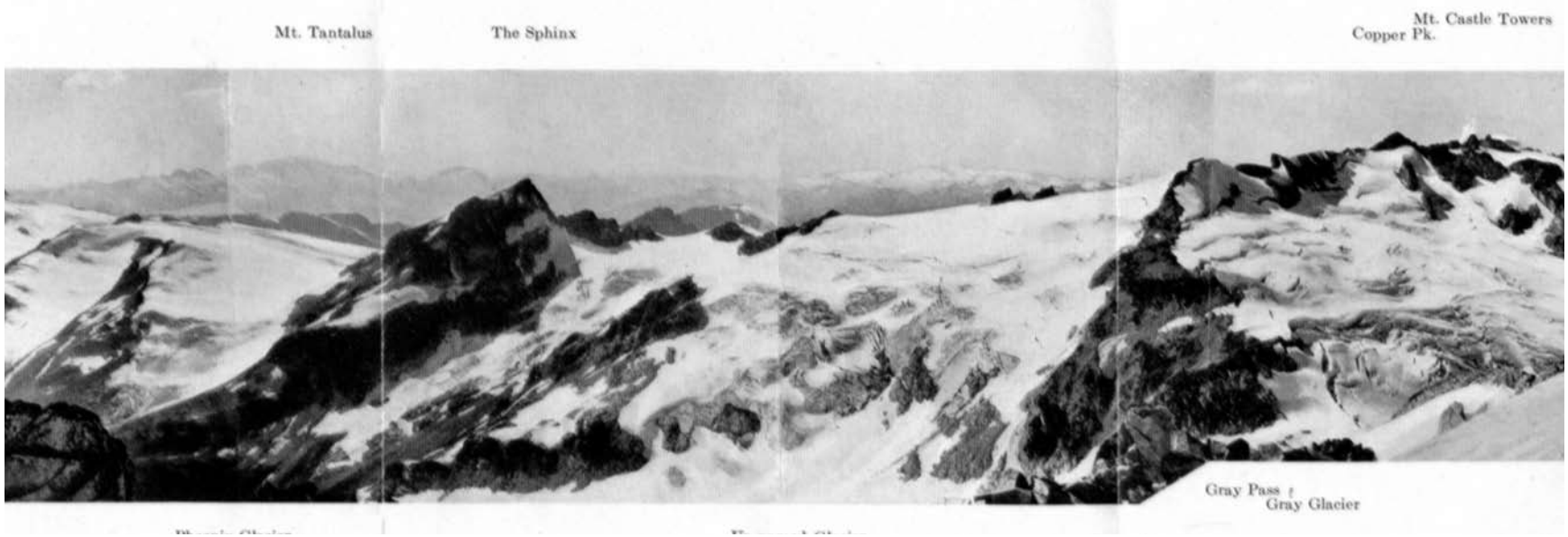
Below this no serious difficulties were met to the col, the summit of Mt. Isosceles being



Photo, Don Munday

Phoenix Glacier

Un-named Glacier



reached at 6 p.m. The aneroid indicated a height of 8,025 feet, with a rising atmospheric pressure. In the lengthening shadows the great icefalls on the northern slopes of the Mamquam Range and in other directions glowed intensely blue; food and films were exhausted, and time did not permit a detailed study of the canyon-cleft ranges now revealed from a nearer viewpoint.

Cliffs on the west face furnished agreeable scrambling; a friendly snowball bridged doubtfully the astonishingly deep schrund. Skirting the cliffs of Parapet, we returned northward to Gray Pass as cliffs and icefalls above them prevented a more direct course down to the glacier on the south side of the pass. Down this unnamed glacier we hurried till it became too shattered, then traversed above timber-line across the east and south faces of the Sphinx, dropped down to Phoenix Glacier, climbed it in the dark to Pitt Pass where, with an acetylene lamp, I signalled our coming to camp with such success that a supperless member of the Garibaldi party met us with a boat below Sentinel Glacier at 10 p.m. A feature of the trip was that we travelled on five different glaciers; in addition, there was the second trip the full length of Sentinel Glacier. The fact of a lady being of the party may not be altogether a fair indication of the strenuousness of the trip. The peak at the south end of Crosscut Ridge is the only unclimbed peak of importance within a day's trip of Garibaldi Lake, but the next day we did not feel like tackling such a distant mountain, so we went to Mt. Castle Towers across the lake. The next day we broke Camp.

An Interpretation Op Some Old Map Names In The Vicinity Of Kananaskis Pass

By J. Monroe Thorington.

Anyone who has studied the modern small scale maps of the Canadian Rocky Mountains, (Century Atlas, Rand and McNally, Baedeker and others), will have noticed that, while many mountain names—Hooker, Brown, Columbia, Lyell, Murchison—appear in the region north of the Canadian Pacific Railroad, usually one name only—Mt. Head— appears in the alpine area between Kicking Horse Pass and the International Boundary.

The name Mt. Head does not appear on the best and most recent large scale maps of the region, namely those issued by the Alberta-British Columbia Boundary Commission.[44] "Where did this mountain come from and where has it gone? Is it just another myth like the 17,000 feet giants, Hooker and Brown, of our school geographies? Some observations on its possible origin and significance may be of interest.

If one goes back to the earliest map of value, that of David Thompson, (Map of the North-West Territory of the Province of Canada. Made for the North-West Company from Surveys carried out 1792-1812), it will be seen that no individual mountain has as yet received a name and that the entire mountain region between Bow River sources and the 49th parallel is indefinitely covered by the name "Duncan's Mountains."

Twenty years later but few changes had been made. In the 1832 map of J. Arrowsmith (British North America. By permission dedicated to the Honourable Hudson's Bay Company), we find that Athabasca Pass is shown in heavy type with Mt. Brown, 16,000 feet and Mt. Hooker, 15,600 feet, on the northwest and southeast sides of the pass. The narrative of the Scottish botanist, David Douglas, who visited the pass in 1827, had given this to posterity. No other mountain names

44 Atlas of the Interprovincial Boundary Commission. Accompanying Part 1, 1917. Sheets 9 and 10.)

appear, although the main chain is designated as '' Rocky Mountains.''

Twenty-five years later, in 1857, the British government authorized the Palliser Expedition, the first for serious exploration, to search for a practical pass in British territory, south of Athabaska Pass, The major part of the work among the mountains was carried out in 1858 and 1859, and on the map of the expedition appearing in 1865[45] the name Mt. Head is found for the first time. The Palliser reports themselves are silent as to the application of this name.

Among the explorers of this expedition was James Hector, to whom we are indebted for the naming of so many now familiar peaks—Lyell, Lefroy, Murchison and others. Certain discrepancies between his journal and the map of the expedition render it difficult to identify accurately some of these peaks; light is thrown on his method of applying names by his statement that "some of these mountains are formed of groups sixty to eighty miles in circumferences, "[46]

Such a system of nomenclature will seem less strange if one remembers that in the early topographical maps of the Alps a name was frequently applied to a massif or group, rather than to a definite peak. Thus, for years the name Monte Rosa was applied to the entire mountain mass east of the Theodule Pass. As Coolidge has well said[47] "The more I study old maps of the Alps and the writings of the older Alpine topographers, the more amazed do I feel that often they entirely neglect to indicate even the most conspicuous of Alpine peaks, or else indicate them so vaguely that one is at a loss to know to which peak exactly the name is meant to apply.''

If we return to the Palliser map, we shall see that between Kananaskis Pass and the region of Elk Pass two names only—Mt. Fox and Mt. Head—appear on the Continental Divide. Northwest of Kananaskis Pass and west of the Divide a third name—Mt. Back— is found. Of these three names Mt. Back and Mt. Fox are survivors on the maps of the Alberta-British Columbia Boundary Commission. (Sheets 9 and 10.) On the latter maps the name Mt. Back is applied to a relatively insignificant peak (9,883 ft.) forming the southwestern buttress of the Belgian Group.

On the Palliser map Mt. Fox appears on the Divide at a point about midway between Kananaskis Pass and the present Elk Pass. In a letter (to W. D. Wilcox) dated January 16th, 1895, Dr. Dawson writes as follows: "I followed nearly all Dr. Hector's routes through the mountains besides a great many others, and by constant reference to his printed journals, where bearings, etc., were often given, was able to identify nearly all his mountain names and perpetuate them . . . All the older names are in my map and report of 1885." In this report[48] Dawson writes as follows (p. 108) : "Nearly opposite the summit (of North Fork Pass) a tributary stream (to Elk River) enters the valley from the west, which is larger than that occupying the main valley (i.e., Tobermory Creek) and is reported by Indians to rise in a lake or lakes (i.e., Elk Lakes) south of Mt. Fox."

This interpretation by Dawson would seem to be the basis of the location of Mt. Fox on the Boundary Survey maps, where it is shown as the western buttress of Elk Pass (West Passage). There is, however, no absolute reason for believing that this is the mountain so designated on the Palliser map. In fact, Dawson admits that the names Mt Back, Mt. Head, and Mt. Fox are not mentioned in the Palliser narrative.

Of Mt. Back, Dawson gives us no information and the name does not occur on the map

45 Journals, Detailed Beports, and Observations Eelative to the Exploration, by Captain Palliser, during the years 1857-60. Folio. London, 1863. (The map of this edition was printed for Stanford's Geographical Establishment, London, and is dated 1865.)

46 Alpina Americana II., p. 14.

47 W. A. B. Coolridge, "Alpine Studies," p. 230.

48 Annual Report of Geological Survey of Canada, Part B, 1885.

accompanying his 1885 report.

On the Palliser map the name Mt. Head appears on the sharp angle of the Continental Divide, at the location of the present Mt. Tyrwhitt (9,428 ft.) of the Boundary Survey (Sheet 9). On the Palliser map the outline of a large mountain is sketched in and covers this entire angle.

Dawson writes of the mountain as follows (p. 96) : "The mountain mass north of The Gap (i.e. in the Highwood Range), of which only the high spurs are seen in following the river, I take to be Mt. Head of the maps. A mountain of this name appears on Palliser's map, and has been given great prominence on several more recent maps, but I have been unable to ascertain by whom the name was applied, or to find any description of bearings by which it might be satisfactorily identified. It may probably have been a peak seen from the eastern plains or foothills at a great distance. Its latitude and position in the eastern range of the mountains, as shown on Palliser's map, accord nearly with the mountain here referred to and, under the circumstances, there is no reason why the name should not be preserved in connection with the mountain, even if it be not that originally intended."

Thus, on the Dawson map of 1885, Mt. Head takes a position in the Highwood Range and is similarly located on later maps of the Geological Survey.[49] The reasons for this seem insufficient. On the Palliser map, the location of Mt. Head is distinctly on and not east of the Continental Divide. It is interesting in this connection that modern geographies (Century Atlas, Rand and McNally) agree in following the Palliser map by placing Mt. Head on the Continental Divide.

A party of the Palliser expedition in 1858 explored and crossed the (North) Kananaskis Pass. It would seem that the nomenclature of the peaks of the vicinity may have originated at this time, as the expedition was at no previous or subsequent period in a better position to examine these mountains at a close range. It is unlikely that the names were given by Dr. Hector; neither he nor Blakiston were members of the party which crossed the pass. The nomenclature is more likely ascribable (as Dawson believed, see 1885 report, p. 11) to Palliser himself.

In view of the fine type of alpine scenery met with on their route across the pass, it seems strange that the present Mt. Back, Mt. Fox, or Mt. Tyrwhitt should be the outstanding summits to which map names would have been applied, even by these early explorers. We must assume that the British Government had sent out men of experience, who knew not a little of topography and of map making. It may be, as Dawson suggests, that the early travellers, even obviously keen observers, such as accompanied the Palliser expedition, lacked a sense of perspective in regard to mountain views and applied names to buttresses and promontories overhanging the valleys instead of to the real summits further back. The same mistakes persist even to-day. It may even be that some of these names were added to the Palliser map at the time of its printing merely to "fill in," long after the expedition had returned to England; the idea may be rejected because of its unlikelihood.

It is much more probable, in view of what we know of Hector's method of applying names, and the methods then current in Continental topography, that the names in the region of Kananaskis Pass may have been given to massifs rather than to definite peaks. If this assumption be true, it simplifies our study of these names and explains in a more satisfying fashion the reasons for applying them.

It is, therefore, suggested that the name Mt. Head perhaps refers to the conspicuous massif on the Divide adjoining Elk Pass, namely the present French Military Group, the highest summit

49 Viz.: Geological Map of Dominion of Canada, Western Sheet 783, 1901.

of which, Mt. Joffre, is 11,316 feet in altitude. This group would easily be seen in crossing North Kananaskis Pass.

It is further suggested that Mt. Fox of the Palliser map is the present British Military Group, the highest summit of which Mt. Sir Douglas, is 11,374 feet in altitude.

The explanation of Mt. Back is more difficult. It is presumably applied to a massif west of the Divide, as shown on the Palliser map. Northwest of Kananaskis Pass lies the Belgian Group, of the Boundary Survey, the highest peak of which is the present Mt. Back (9,883 ft.), two miles southwest of Palliser Pass and an inconspicuous peak when compared to others in the vicinity. It would seem, therefore, that the Mt. Back of the Palliser map perhaps belongs to a finer massif which must have attracted the attention of the explorers during their crossing of Kananaskis Pass. If this be true, and the Palliser map location would bear it out, the name was intended to designate the present Royal Group, the highest summit of which, Mt. King George, reaches an altitude of 11,226 feet.

The above theory is based entirely upon deductive reasoning and a study of available literature and maps; it may be utterly wrong. At all events the study has been of interest and the evidence is presented for what it is worth. The name Mt. Head appears to have been given in honour of Sir Edmund Walker Head, Governor General of Canada, 1856-1861. But who gave the name, and what has become of the mountain?

Further Comment

By A. O. Wheeler

In the light of later surveys Palliser's map is sketchy and inaccurate.

Mt. Head is shown by Palliser's map to be situated at the northern extremity of the Livingstone Range, and the Continental Divide is shown to pass over it. This is incorrect. The Divide does not traverse the Livingstone Range in any part, but travels along the crest of the High Rock Range many miles to the west of it, on the western side of the Livingstone Trough, which drains to Hudson's Bay.

Dr. Dawson, on his 1886 map, the completed map, places Mt. Head in the Highwood-Livingstone Range at about the same latitude as Palliser's map. This is accepted as its position and in our surveys I have sighted upon what I understood to be the mountain, although it does not come within the range of the Interprovincial Boundary map sheets. It appears in such position on current issues of departmental maps.

James White, F.R.G.S., in his "Place Names in the Rocky Mountains between the 49th parallel and the Athabaska River," read at the May meeting of the Royal Society of Canada, 1916, gives the following, viz.: "Head; mount, Elk River, B.C. and Alta.; after Sir Edmund Head, Governor General of Canada, 1854-61, Governor of the Hudson's Bay Co., 1863-68 (Palliser)."

As to the peaks to which the names Plead, Fox. Back, etc., were originally applied, it is impossible to tell for a certainty from the original records where their position is. Most of the line of travel of the members of the Palliser Expeditions lay up the valley bottoms and in many cases the high culminating peaks were not apparent from them.

The sources of the Highwood River are not shown on Palliser's map. If Palliser's Trap Creek is the Highwood River of the present day, its source is shown at Mt. Head. It is obvious that Mt. Head could not be where the watershed turns to cross Elk Pass because there is no mountain there of outstanding prominence, that on which the name Tyrwhitt has been placed being only a minor elevation of the ridge.

If, as suggested, the present Mt. Joffre were the Mt. Head of Palliser's map, then the Elk River and Livingstone Range of the map are badly out of place.

It may be that the present Mt. King George is the original Mt. Back, but there is no way of proving it. The Royal Group, with Mt. King George as the central massif, seems to be an appropriate name for this fine group and, as it was desired to retain the name Mt. Back with regard to Palliser's nomenclature, it was placed by the Boundary Survey where it now stands.

IN MEMORIAM

Clara Wheeler: An Appreciation.

The sudden death of Mrs. Wheeler at the early autumnal age of fifty-nine saddened every member who knew her in this Club. But we think of the heavy blow to those whom she loved most and who loved her most. It is difficult to write with restraint of that dauntless, active spirit and its continual triumph over physical frailty and suffering.

From the very first summer session of the young Alpine Club of Canada, Mrs. Wheeler was her husband's capable collaborator. She attended the annual camps as long as her delicate health permitted. After a grave illness which overtook her at Lake Louise and involved a gallant fight for life in which the victory was as much hers as the physicians' of the Hospital at Banff, she settled at the sea's level in Sidney, Vancouver Island, where Mr. Wheeler could spend the winters. In 1919, when her health seemed so much improved, she came again to Banff for the summer months, living later on at the Middle Springs Camp. Stricken with the last illness, she passed away on August 24th.

Mrs. Wheeler was born in Belleville, Ontario, on April 25th, 1864, the daughter of John Macoun and Ellen Terrill. She married Arthur 0. Wheeler on June 6th, 1887, in Ottawa, whither her parents had removed when Professor Macoun entered the Natural History Branch of the Geological Survey of Canada. Her married life was spent in Ottawa and in Calgary until removing to Sidney. She leaves one son, Major E. Oliver Wheeler, M.C., R.E., now attached to the Survey of India. Her aged father and mother and one brother, James, died a few years ago and a younger sister, Mrs. W. M. Everall, died on the day of Mrs. Wheeler's death. Two only remain of a singularly gifted and happy and affectionate family: William T. Macoun, Dominion Horticulturist, Ottawa, and Mrs. R. A. Kingman, Wallingford, Vermont.

Mrs. Wheeler inherited many of her remarkable father's gifts and characteristics. She had a talent for affairs and a faculty for detail that amounted to genius. She was but seventeen when, with a sister, she compiled and arranged the voluminous notes and material on which the text was founded of Professor Macoun's first book "Manitoba and the Great Northwest." Her sympathy with her husband's pursuits was based on real knowledge. Her organizing powers were apparent to us all during those early A.C.C. Camps where her guiding hand was on the cooks, the commissariat, and on all other arrangements for the comfort of large mountaineering parties. She speedily won a place in all our hearts. Mrs. Wheeler suffered much in those days, but who of us ever heard her whimper then or later? She had no uncertain ardour and independence, like her father's, but tempered with an element of stoical courage. Her keen mind was never inactive, her hands were never idle. Flowers bloomed for her.

The years of physical suffering added to natural beauty gave her face a haunting quality. When we remember her, we see the finely moulded features, the delicately fresh complexion, the

high forehead, the smile about the eyes and mouth, the snowy hair. A couplet of John Donne's comes to mind:

"Not Spring nor Summer beauty hath such grace As I have seen in one autumnal face."

This brave woman died in Banff and there she lies in her resting grave, under the shadow of the mountains. We shall not forget her.

Elizabeth Parker.

Edward Willet Dorland Holway

Edward Willet Dorland Holway died in Phoenix, Arizona, March 31, 1923, at the age of seventy years. He was born in Adrian, Michigan, February 13, 1853, and when about one year old, was taken by his parents to what were then the frontier settlements of northeastern Iowa. There he lived for fifty years, becoming a successful banker in the city of Decorah. While engaged in this business he took up the study of botany as a hobby, and particularly the botany of the rust fungi—a subject in which ho was an acknowledged authority at the time of his death. On retiring from active business in 1904, he moved to Minneapolis in order better to pursue his botanical studies, and became connected with the University of Minnesota as assistant professor of botany.

His interest in the mountains was first aroused during a visit to Switzerland and seems to have become crystallized during two short visits to the Canadian Rockies in 1901 and 1902. In 1901, after spending most of his short vacation at Banff, he went up to Lake Louise and climbed Mt. Victoria with Hans Kaufmann as guide—his first high climb. They experienced a blizzard at the summit and had considerable difficulty in returning to Abbot Pass. Nothing daunted by this adventure he returned to Lake Louise the following year and met the guide Jacob Miller, to whose example and advice he always attributed much of his skill as a mountaineer. A record of his trips this year may serve as an example of his great energy and the thoroughness of his conversion to the mountaineering craft. With Miller he crossed Abbot Pass and returned via Hector the same night. The next day they walked to Moraine Lake, bivouacked high above the lake, and the following day climbed Mt. Temple, directly up the southeast side, cutting a hole in the cornice to reach the summit. They returned via Paradise Valley, walking back to the hotel that night, and the following afternoon started for Mt. Hector, camped under its southerly cliffs, and the next day climbed it straight up the cliffs, as Miller said the west ridge was too easy, ‘’ anybody can climb it that way.’’ They got back to the hotel at 10 p.m., and Holway writes: "I entered the hotel and met Mr. Dubois, who said that he wanted to walk around Mt. Temple, starting at five a.m. in the morning, and asked me to join him. I hesitated a little, but told him if he would make it six instead of five I would be with him. We agreed, and had a most delightful tramp. This ended my vacation, and it certainly was a strenuous week." Strenuous indeed for a man in his fiftieth year who had climbed his first high mountain only twelve months before.

One of the remarkable circumstances of his life is the late date of his contact with the mountains and the thoroughness with which he mastered their lore. Like the late Winthrop E. Stone, at an age when many mountaineers feel that their best climbing years are behind them, he set out, not only to climb, but to master thoroughly the art of mountaineering.

So well did he learn his lesson that after his first two or three years in the mountains he became one of the most daring and successful climbers. His record in the Selkirks alone is remarkable—twenty-three summits over 10,000 feet, several of them climbed more than once, thirteen of them first ascents, and nine of them made without guides. Besides his climbing and exploration in the Selkirks he climbed Mt. Longstaff, made the first ascent of Mt. Edith Cavell,

and conducted a notable pioneer exploring and climbing expedition into the Caribou Range, all without guides.

I first met Mr. Holway in 1904 when he came to Minneapolis, and for many years thereafter it was my great good fortune to be with him in the mountains every summer, and to have the advantage of his great skill, inexhaustible energy and delightful companionship. In all our trips he was the true leader. As a camp companion he was the finest whom it has ever been my fortune to meet. On the trail and in the mountains the only fault to be found with him was that his unfailing energy sometimes wore out us mere mortals who tried in vain to keep up the pace. In serious climbing, .and particularly in the difficult art of snow and ice-craft he was a tower of strength. A badly crevassed glacier or a particularly nasty bergschrund seemed to kindle within him a kind of fierce joy and he proceeded to conquer them forthwith, sometimes to the amazement of his companions.

Theoretically solitary climbing is a most dangerous pastime, particularly when it involves ice work, but it undoubtedly contained fewer elements of risk for Mr. Holway than for most people even among skilful climbers. Along with his great skill he possessed an almost uncanny ability to concentrate his mind on the work in hand. He could walk for hours across a snow-covered glacier and never for an instant take an inadvertent step. As a solitary climber he accomplished several remarkable feats—Mt. Stephen, Mt. Rogers, climbed from Glacier House between breakfast and dinner, and the second ascent of Mt. Sugarloaf, climbed during a lone camping trip up the Beaver Valley. It should be further noted that he never took these solitary trips from choice. They were his last resort when his companions failed him through weariness or sheer laziness, or when duties elsewhere called them back from the mountains. Though we undoubtedly impeded the speed of his travel, he always preferred to have us with him, and particularly in those glorious hours when we sat on some recently conquered summit, "absorbing the view," as he expressed it.

During his last few years, he was not in his beloved Canadian mountains, as his time was largely taken up by two long botanical trips to South America, Though he saw the finest parts of the Andes from Southern Chile to Ecuador, he confided to me that none of them were really as beautiful as the Selkirks, and just before lit was taken ill last October he was talking of his hopes that he might be able to take another long trip in that supremely lovely range. In his death the Canadian mountains have lost one of their truest friends, and those of us who knew him best are bereft of a most lovable companion, a wise counsellor, and an indomitable leader.

Fred. K. Butters.

ALPINE CLUB NOTES

First Ascent of Mt. Biddle by the West Ridge.

The first ascent of Mt. Biddle by the west ridge, and the first traverse of the mountain, were made by Rudolf Aemmer and the writer on August 26, 1915. As this attractive climbing route appears to be little known, it is hoped that the following brief account may be useful to other parties visiting the O'Hara district.

We were camped at Lake O 'Hara, having crossed Mt. Victoria and climbed Mt. Hungabee on preceding days. On the 26th we left camp at 3:10 a.m. and followed the path to Lake McArthur, skirting along the south shore of the lake and ascending thence to the broad saddle between Mt. Biddle and Park Mt. From there we walked along the wide, shaly ridge over two small eminences to

the base of Mt. Biddle, and gained some little altitude on the mountain itself without difficulty. At a height of something less than 10,000 feet formidable cliffs of massive limestone were encountered and provided severe and spectacular climbing. A short chimney with an overhanging chock stone and quite without holds, required considerable "backing up" and other gymnastics. The cliffs above had in several places to be surmounted by axe holds in small cracks. At length we came out upon a fine level platform overlooking the glacier and Lake McArthur, where we lunched and whence rotten but practicable rock led to the summit at 12:05 p.m.

After almost an hour on top, and having some doubt whether it would be possible to descend the way we had come, we went down by the old route along the south ridge. This we found long and circuitous but quite easy. As we were leaving the mountain, storm clouds came up from the east and we hurried down to camp, getting in at 6:40, just as it began to rain hard.

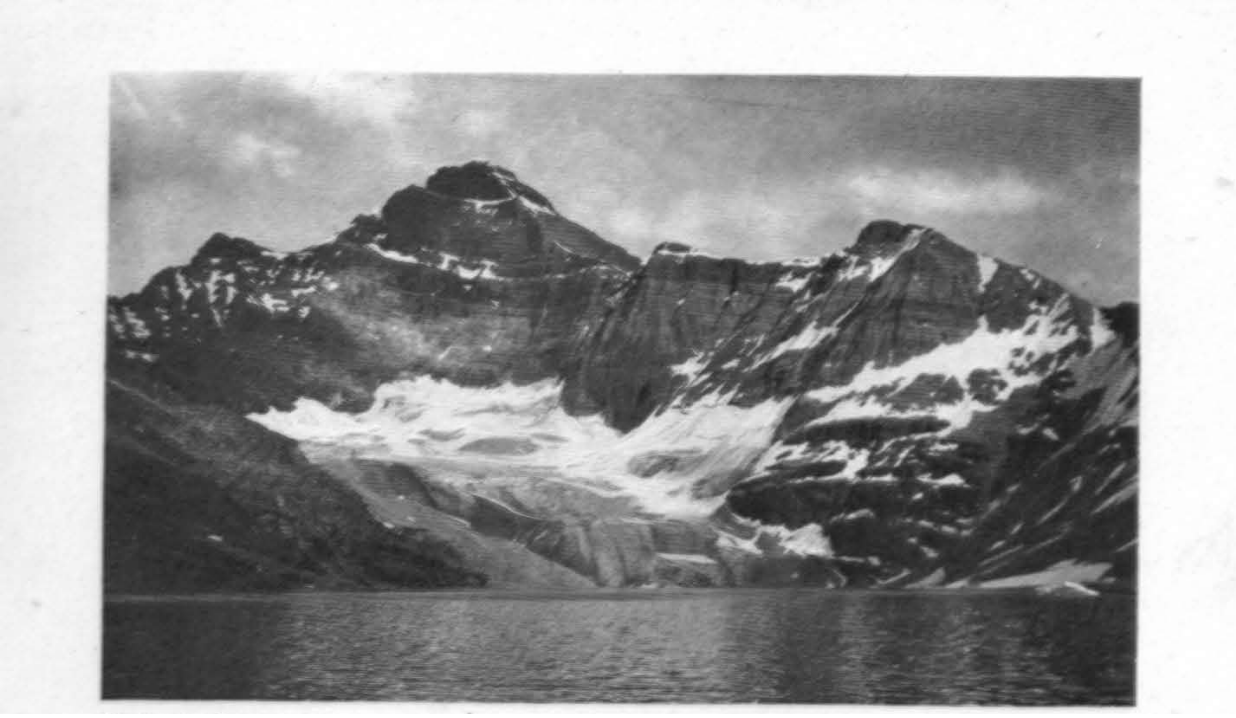
The west ridge of Mt. Biddle is the structurally direct route of ascent from the O 'Hara side. It is a rock course of unusual merit and deserves the attention of those interested in this sort of work. The climbing on it is, in the recollection of the writer, more serious than anything on Hungabee and quite comparable to the best on Mt. St. Bride ("White Douglas"); or on Pinnacle before it was roped. The rock in the difficult pitches is firm.

Allen Carpé.

Northeast Face of Mt. Victoria—(New Route).

The glacier clad N.E. face of Mt. Victoria, 11,355 ft., faces the Chateau Hotel at a distance of some 6 miles and towers nearly 6,000 ft. above Lake Louise. Some four years ago I, in company with Rudolph Aemmer of Interlaken, made a first attempt to reach the main peak directly over this face, but we did not get any further than the breakfast place on the upper Victoria glacier. Threatening weather caused us to turn back and defeated us on three subsequent attempts. On one of these we advanced as far as the last wall, which is about 1,600 ft. high with an average inclination of a little more than 50 degrees, but were driven back by stones which were being dislodged by a high wind.

On July 15th, 1922, the same party left the Chateau at 12:10 a.m., reached the breakfast place on the upper Victoria glacier at 3:10, by lantern light, and the foot of the final wall at 5:25 a.m. The upper Victoria glacier proved to be in good condition and progress to the foot of the last slope was easy and rapid. A berg-schrund guards the approach to the last wall, it is followed by a steep ice slope, then a belt of the much disliked black rock, above which another ice slope leads to the summit. This last slope is occasionally interrupted by mostly loose outcrops of grey-yellow and brittle rock. The summit ridge, near the main summit, is formed by another layer of the black rock. The bergschrund was easily crossed just below the main summit but the following ice slope was covered with deep powdery snow which all but defeated us. A hard, two inch thick crust was all that enabled us to negotiate this nasty bit. All protruding rocks were glazed and very treacherous. Rudolph lead with great discrimination and 1 1/4 hours later the first black belt was behind us. Believing my friend we struck straight for the summit utilizing the protruding rocks when possible and cutting in between. At 10 a.m. were within 600 ft. of the summit and Rudolph again went to the fore. An attempt to continue our line yielded an advance of 25 yards in 1 hr. 10 min. The slope immediately above seemed to bulge as we advanced. This great steepness and the considerable amount of half-frozen snow made it necessary to cut deep and we finally decided to gain time by changing our line. Going back 25 yards we traversed north along the very steep ice slope until the bulge was passed, then striking up again we reached the summit ridge at 1 p.m. just where the first



Mt. Biddle From Lake McArthur, Showing West Ridge. Photo, A. Carpe

Mt. Victoria. Photos, Val A. Fynn
N.E. Face Of Main Peak From E. Ridge Of N.Peak.

Mt. Victoria Showing Route Of Ascent.

rocks show. After a quarter of an hour's rest, 20 minutes more of easy going south saw us on the main peak. Leaving the summit at 2 p.m., the main ridge was followed south for 50 minutes, after which we took to the S.W. face in a snow storm and so on to Lake O'Hara which was reached at 6 p.m.

If anyone ever finds good snow on this face the ascent will not be found difficult. Failing good snow the expedition requires a good deal of effort. The greatest care will always be necessary because of the steepness and the lack of reliable anchorage.

Val. A. Fynn.

Mt. Warre and Mt. Vavasour.

These two mountains, which we passed on our walk to the main camp of the Alpine Club of Canada in Palliser Pass, and the camp in Kananaskis Pass in July, 1922, recall an interesting episode in British and American history, in which these two passes played a part.

In 1845, when there was a possibility of trouble between England and the United States over the Oregon international boundary dispute, Capt. Henry J. Warre, A.D.C. to the Commander of the Forces, and Lieut. M. Vavasour, B.E., were sent on a secret mission to find a possible route for troops across the prairies and through the Rocky Mountains to what was then all called Oregon, or as Warre spelled it, Oregon Territory, but is now Washington State. They left Montreal on May 5, 1845, in company with Sir G. Simpson, Governor of the Hudson's Bay Company, and other men of that company. They reached Fort Garry (Winnipeg) June 7. They left Fort Garry June 16 on horseback, and reached Fort Colville on the Columbia River, in what is now Washington, on August 12. Their route was by Fort Edmonton, which they left with sixty horses, but lost all but twenty-seven through the difficulties of the mountain passes, and of these twenty-seven surviving horses many were quite exhausted.

From Fort Colville the party descended the Columbia River by boats, reaching Fort Vancouver in Washington, a Hudson's Bay Company's station, on August 25, 1845. Later on they visited Fort Victoria, on Vancouver Island. (Fort Victoria had been built by the Hudson's Bay Company in 1843 to take the place of Fort Vancouver in Washington, when the United States laid claim to the country.)

During the winter they explored the country to the border of North California. On March 25, 1846, they started back from Fort Vancouver up the Columbia River to Fort Colville; thence to Boat Encampment on the Upper Columbia River, up Canoe River to Jasper's House; then down the Athabaska River to Fort Assiniboine, thence by saddle to Fort Edmonton, May 17, and arrived at Fort Garry, June 7, and Montreal, July 20.

It is fairly certain from Warre's despatches, and a map of his route, that they entered the Rockies by Bow River and Kananaskis Pass, or Palliser Pass. They reported that the route was quite impossible for troops. In the Provincial Library, Victoria, B.C., are copies of their instructions from the British Government; they were, "to observe perfect secrecy as to the objects of their journey." Also full accounts of their expedition, and their confidential reports thereon; also detailed bills paid to the Hudson's Bay Co. for food and other supplies, every little item given, even their laundry bills, showing the cost of things in those days.

There are also two copies of '' Sketches in North America and the Oregon Territory," by Capt. H. Warre, published by Dickenson and Co., 114 New Bond Street, London, containing fine large pictures of the Rockies, etc., by Capt. Warre, with an account of his expedition.

F. W. Godsal.

Note—Old Etonians will be interested to know that the Captain Warre, referred to above, was the uncle of Dr. Warre, so long connected with the school.

REVIEWS

Mount Everest: The Reconnaissance, 1921 — Lieut. Colonel Howard-Bury, D.S.O., and other members of the Mount Everest (1921) Expedition.

London: Edward Arnold & Co., 1922, Pp. x and 356. Maps and Illustrations. 25s. Net.

This beautifully-illustrated book has also been published in an Edition de Luxe, a copy of which, presented to the Alpine Club of Canada by some of the Club members, is in the library at Banff together with two copies of the ordinary editions also presented by members. The Edition de Luxe contains a few more illustrations, and is more handsomely got up than the ordinary edition; only a limited number of copies, however, have been printed.

The publishers, as well as Colonel Howard-Bury and Mr. Leigh-Mallory, on whom fell by far the greatest portion of the work in writing the history of the expedition, are to be congratulated in getting out such an admirable book so soon after the return of the expedition.

The book opens with an introduction by Sir Francis Younghusband, K.C.S.I., K.C.I.E., President of the Royal Geographical Society, discussing the previous history of Mt. Everest and setting forth the aims of the expedition, scientific and otherwise. " 'What then?' some one will ask. 'Suppose men do reach the top of Mt. Everest, what then?'" " 'Suppose we do establish the fact that man has the capacity to surmount the highest summit of his surroundings, of what good is that knowledge?' " "This is the kind of question promoters of the enterprise continually have to answer. One reply is obvious. The sight of climbers struggling upwards to the supreme pinnacle will have taught men to lift their eyes unto the hills—to raise them off the ground and direct them, if only for a moment, to something pure and lofty and satisfying to that inner craving for the worthiest which all men have hidden in their souls. And when they see men thrown back at first but venturing again and again to the assault till with faltering footsteps and gasping breaths they at last reach the summit they thrill with pride. They will no longer be obsessed with the thought of what mites they are in comparison with the mountains—how insignificant they are beside their material surrounding. They will have a proper pride in themselves and a well-grounded faith in the capacity of spirit to dominate material.''

Colonel Howard-Bury's portion, ''The Narrative of the Expedition,'' deals in graphic style with the general story of the preparations for the exploration of the greatest mountain in the world, and of the five months spent by the expedition in this work. Besides his detailed description of the journey and experiences of the party, his chapters are crammed full of most interesting and instructive information about the country and its people.

The second part, dealing with the climbing, is more technical, but Mr. Leigh-Mallory carries the reader with him on his reconnaissances of the approaches to the mountain from the west, north

and east, and eventually to a height of 23,000 feet on the Chang La (North Col), on the route finally chosen for the assault; he describes with eloquent pen his hopes and fears of finding a practicable route to the summit, and discusses at length the possibilities of reaching the summit, and the effects of the weather, season and altitude.

The main portion of the book is concluded by natural history notes and a description of an excursion to a very out of the way portion of Tibet, (Nyenyam and Lapche Kang), by Dr. Wollaston,

the naturalist and Medical Officer of the Expedition; and "An Appreciation of the Beconnaissance" by Professor Norman Collie, F.B.S., President of the Alpine Club, and an Honorary member of the Alpine Club of Canada. His appreciation consists in a brief summing up of the work done by the expedition, the conclusions to be formed from their reports, and the probable party and general programme for the 1922 expedition.

As appendices, follow notes by the experts concerned on the Survey of the country traversed en route Mt. Everest, the Photographic Survey of the immediate neighborhood of the mountain, the Geological results of the expedition, the Scientific equipment, and a list of Mammals, Birds and Plants collected by the expedition.

The book is illustrated by 33 magnificent full-page photographs, and contains 3 maps, one to illustrate the route of the expedition, one of Mt. Everest and its environs and a geological map of the Mt. Everest region. Altogether '' the out-turn of work during the expedition was as follows:—

1/4 inch revision survey - - - 4,000 square miles

1/4 inch original survey - - - 12,000 square miles

Detail Photo-survey (environs of Mt. Everest - 600 square miles.

E. O. Wheeler.

First of Canadian Naturalists.[50]

John Macoun was a remarkable man and a singularly happy one. From childhood his was an eager, inquiring mind and a habit of diligence. Natural history he loved and also work, but his interests were versatile. First of Canadian field-naturalists, his wide and accurate knowledge was empirical and rooted in a long life of research. That he lived to the great age of eighty-nine, retaining to the end his keen faculties and healthy physical frame, was no doubt owing to simplicity of living, absorption in his vocation, and interest in all the larger movements of life. His autobiography, written in the closing years of his long and active career, is a volume of real interest and charm. The interest is in the information between its covers, and the charm lies in the candour and childlike naiveté of the narrative. How true a word it is that the style is the man.

John Macoun was Irish born though his remote forebears came to County Down from Scotland. He came to Canada in 1850, at the age of nineteen, and worked on a farm where he took notice of the strange wild flowers and began to make botanical enquiries. Within the next ten years he was teaching school and pursuing practical observations in botany. In 1862 he made a happy marriage, and good fortune henceforth marked every step. By the end of that decade he was professor of Natural History in Albert College, Belleville, the Chair including geology, physical geography and meteorology, as well as botany. By this time his steady experimental studies in the field had won him a reputation below the boundary and beyond the Atlantic.

It was in 1872 that Professor Macoun first met Sir Sandford Fleming and Dr. G. M. Grant on board a Lake Superior boat, and was invited to join as botanist their expedition across the Rockies in search of a possible route for the C.P.R. by way of the Yellowhead Pass. At Edmonton he and another member of the expedition were requested by its Chief to proceed to the Peace River country and go through the mountains to Fort McLeod. The chapter describing the exploration and travel to the Pacific and home again is one of the best in the book. Professor Macoun's report so impressed Dr. Selwyn, head of the Geological Survey, that he asked him to join the Government's

50 Autobiography of John Macoun, M.A., Canadian Explorer and Naturalist, Assistant Director and Naturalist of the Geological Survey of Canada, 1831-1920. Pub. The Ottawa Field Naturalists' Club. 1922.

expedition into that north country in 1875. In this second expedition he travelled 8,000 miles, going first to Victoria through the United States and working eastward. He brought back with him some fine examples of wheat and barley grown at Fort Chipewyan, also reports of wheat and other cereals grown as far north as Fort Simpson on the Mackenzie. Here the autobiographer tells with a twinkle in his eyes how the Hon. David Laird, Minister of the Interior, told him that the Prime Minister had been enquiring about him. "Would I like to see him? I certainly would, and I found him a very pleasant little Scotchman, but very conservative, for he would not believe one word I told him about the Northwest. When I told him you could travel for two hundred miles and not see an acre of bad land, he said 'I canna believe it.' "However, the next year Mr. Mackenzie asked him to write a full report on the whole country between Port Arthur and the Pacific. (It is in the Railway Report of 1877.) "It raised my stock above par and opened the eyes of a great many politicians and other people." Mr. Mackenzie woke up.

Professor Macoun was now made Professor Emeritus, and his services were in demand by the Government which meantime had changed to Conservative. He was appointed chief of an expedition to examine the country lying between Fort Ellice (to which he travelled by a steamer on the Assiniboine from Winnipeg) and the Elbow of the South Saskatchewan by way of Long Lake and onward west to Old Bow Fort—if he had time. So it was that he travelled through the "Flower Garden of the Northwest" where the soil was rich, where there was water for man and beast. Beyond the '' Garden '' there were adventures of another kind, but the great result of the expedition was the explorer's report of millions of acres waiting for cultivation. His lectures and his book, "Manitoba and the Great North West," opened the eyes of Canadians to the value of the vast Savannahs lying between Winnipeg and the Rocky Mountains.

In 1881 Professor Macoun was appointed Botanist to the Geological and Natural History Survey of Canada. The next year he removed to Ottawa. It was the year of the founding of the Royal Society of Canada by his Excellency, the Marquis of Lorne, and the first Dominion Botanist became a charter member. In 1884 he visited the Rockies with the British Association, travelling by rail as far as steel was laid by the C.P.E. With another member and without proper boots or equipment he climbed Mt. Cathedral to an altitude from which there was an excellent view of Sherbrooke Lake and the Yoho Glacier, both then unnamed. In 1885 he was botanizing in the Rockies and Selkirks, climbing various mountains for specimens. He tells us that he and his son were the first to climb in the vicinity of Glacier and Rogers Pass. They climbed Mt. Avalanche and had a good view of the Illecillewaet Glacier. It was hard climbing as they had no nails in their boots. Young Macoun took his off and climbed the last 500 feet in his socks. Among mountains climbed as far as vegetation went, were Mt. Cheops and one of the Swiss Peaks.

Professor Macoun made other expeditions into the mountains, his climbing always being in the interests of flora or fauna. Indeed he made a comprehensive survey of the flora of the whole Dominion. He made large and valuable collections during many years of eager investigations, and did not cease from scientific activities in the various branches of his department even when superannuated by the Government. His last years were busy years on Vancouver Island, where he and his wife made their home with their daughter, Mrs. A. O. Wheeler. True, he had grown somewhat frail, but his interests were eager and he kept working out of sheer joy in it. He made a valuable collection of plants including cryptogams (non-flowering) for the Provincial Museum. It is unlikely he ever spent an entirely idle day in his life. When not busy with his vocation, he was engaged in good talk. He had an extraordinary memory and a logical mind; a great enthusiasm for what he knew and believed; a quick, shrewd judgment and a ready Irish wit. He had an ingenuous

delight in appreciations of his talents and achievements. He was the happiest and most fortunate of naturalists, happy and fortunate in his calling and in his family and friends.

Elizabeth Parker.

"The Call of the Mountains"—By LeRoy Jeffers.[51]

Devotees of out-of-door sports and lovers of the monumental works of Nature as found in the mountains, the canyons, the caves, the deserts, and the rugged sea coasts of the North American Continent are indebted to Mr. Le Roy Jeffers for the comprehensive and intimate way in which he has laid before them, by picture and description, a panorama of these many wonders in his book, '' The Call of the Mountains,'' which already has gone through its first edition.

With over one hundred excellent photographs to illustrate the various subjects which he describes and lays vividly before the reader in such a masterly and feeling way, the book is assured of a large circulation and is destined to exert a strong influence for a better appreciation of what this continent has to offer the travelling public and thus to justify the admonition, "See America First."

Consisting of 282 pages of text, the book is divided into five parts more or less along geographical lines so that the reader may readily know what is worth while seeing when he happens to find himself in any one of these sections of the continent. Here also is given a brief outline of the character of equipment used when engaged in the '' Sport of Kings'' and of the various interesting problems that are met with and must be successfully met in order to attain the objective and enjoy all the compensations for achievement.

Doubtless the most interesting chapter of the book to the mountaineer is the one descriptive of the author's first ascent of the northeast summit of Mount Moran, the second highest mountain in the isolated Teton Range of Wyoming; a solo climb that must have tested his endurance and resourcefulness to the limit and clearly shows the vitalizing effect of such sport upon the man physically fit to engage upon it.

Sections devoted to the Canadian Rockies and Selkirks will prove interesting to members of the A.C.C., for they will recall many happy days spent in favourite spots so interestingly described with typical pictures of illustration in which almost any member might place himself on the rope.

In the climb of Pinnacle the power of suggestion is clearly shown when a climber of Mr. Jeff erg' ability will use the ropes that desecrate its walls. Why should they have been placed there or be allowed to remain when the routes they indicate are feasible without their aid for any party fit to undertake the climb? Let us hope that no more of our peaks will be subjected to such an indignity.

The description of the entrance to the Yellowstone by way of the North Fork of the Shoshone is excellent and accurately portrays the ever-changing spectacle just as the traveller will find it; a,nd the same qualities are shown in the passages on the Fairyland country of Paradise Valley and other beauty spots on Mount Rainier, and of the rugged scenes in Glacier National Park,

"Yosemite the Incomparable" with its beautiful illustrations absorbs the reader and makes him wish to go at once and see and feel for himself this inspiring sight, from above and below, where in a comparatively small area are assembled all the elements necessary to make up one of the world's most famous temples of Nature.

It is certain that the Grand Canyon of the Colorado will always be rated very high by anyone that has ever seen it. Mr. Jeffers has made an extensive tour of the Canyon that has been the

51 Dodd, Mead & Company, New York, 1922.

privilege of but few, although he declares such spectacles beggar description and can be appreciated only by being seen, he portrays them in such detail that one who has seen a part can imagine the whole; the most superb blending of color with architecture that time has given us.

Appealing to the curiosity and venturesome spirit in people, a trip to the Mammoth Cave in Kentucky and to the Cliff dwellers in Mesa Verde Park would indeed be gratifying to any person, the latter probably taking first place in the interest of the average traveller as it records a meagre history of a mysterious race that lived and prospered in such unusual surroundings and then completely disappeared, leaving nothing but the ruins of their habitations and a few vague traditions to posterity.

The chapters dealing with the rugged Oregon coast and those of New England where the author spent his boyhood days are most vividly and attractively described and it is easy to see how his early training in scrambles over the wet and sometimes glazed cliffs prepared him for the difficult stretches he later encountered on many a mountain side.

Indefatigable mountaineer as he is, with' an enviable number of major peaks to his credit, many of them gained only after miles of approach and many hours of sustained effort, the exquisite chapter on the desert and other references to it would almost convince one that the author found more complete joy and feeling of quiet contentment in these broad stretches with their scanty vegetation than he does when on high levels.

With such a vast number of grand scenic spots dotted over this continent to delight the traveller, the summer vacation can well be spent in seeing our own land; but unfortunately until very recently, little has been done to care for those seeking recreation in winter time, and the chapter on winter sports comes as a timely suggestion of what this country now offers to the skater, the skier and the devotee of the snowshoe to give him these healthy outdoor exercises without incurring the expenses of a trip abroad.

If our continent can but overcome its crime of "newness" it easily can take first place in the line of resorts for winter as it already has done for summer.

A. H. MacCarthy.

Buendner-Alpen; vol. 4, Suedliche Bergellerberge, Monte Disgrazia. By H. Ruetter.

A most excellent and essentially modern climber's guide to one of the most attractive parts of the Swiss Alps, a paradise for the rock climber with some steep ice work thrown in occasionally. Mr. Ruetter had no easy task as far as nomenclature is concerned, but chose and followed what is probably the most rational course. The district lies along the Swiss-Italian frontier and many of the peaks and passes are currently known by one name in Switzerland and by another in Italy. Peaks and passes on Swiss Territory have been named by Italians and vice versa. The Swiss have long made it a rule not to apply names of individuals to either peaks or passes; the Italians rather like to do so. The author discarded all names of individuals and, in case of duplicate names, selected the one which appeared the more appropriate or the more popular regardless of its origin. Mr. Ruetter was fortunate, and duly acknowledges it, in securing the help of the celebrated Engadine guide Christian Klucker. The latter was the pioneer of the district covered and there is no one who has a more thorough knowledge of the country or its history. The volume is attractively light and not too bulky.

Val. A. Fynn.

Alpes Valaisannes, vol. 2, by Dr. H. Duebi, translated into French by A. Wohmlich.

This volume is admittedly, and really necessarily, based on the earlier guides to this district by Goolidge and also Conway, but of course contains much additional matter. The French edition is not merely a translation but a very far-reaching revision of the original, particularly as regards the Jumeaux de Valtornanche Group. The modern tendency to give views of the mountain or pass with the route or routes sketched in is freely indulged. It has much to commend it and in many cases is all sufficient. The volume is most complete but does seem to be too bulky and heavy. It is a library rather than a field guide and contains much extremely interesting information which is not strictly necessary to the climber when on the mountain.

Val. A. Fynn.

OFFICIAL SECTION

Report Of The Palliser Pass Camp, 1922.

The Seventeenth Annual Camp of the Alpine Club of Canada was held at Palliser Pass Summit from July 29th to August 12th.

Again, as in 1920, advantage was taken of the camps of the Mt. Assiniboine Walking Tour route. Nights were spent at the Eau Claire, the Fishing and the Trail Centre Camps. From the last the trail branched off that to Mt. Assiniboine and followed the Spray River to its head.

The Camp was pitched close to Belgium Lake at an elevation of somewhat less than 7,000 ft. in a most picturesque situation. A subsidiary Camp was pitched at North Kananaskis Pass in the centre of the British Naval and Military Group.

The climbing, on the whole was more difficult than that surrounding the average Camps of the Club. Before the Camp opened members had climbed—both first ascents—Mts. Queen Mary and Birdwood. During the life of the Camp first ascents were made of Mts. King Albert, Maude and ‘’ Tipperary,’’ and second ascents of Mts. Jellicoe, Back, Sir Douglas, Beatty and Queen Elizabeth. Accounts of the various climbs appear elsewhere in this book.

The Swiss Guides kindly lent by the C.P.R. Hotel Department were Ernest Feuz and Rudolph Aemmer. As always, they gave excellent and highly appreciated service.

Among the guests present were Mr. A. L. Mumm, formerly Vice-president of the English Alpine Club and a Life member of our own, and two well-known climbers of earlier days, Sir James Outram and Rev. Dr. H. P. Nichols.

There were 107 placed under canvas, among them representatives of the Alpine Club, England, the American and Swiss Alpine Clubs, the Appalachian Mountain Club, the Mountaineers, the Mazamas, the Sierra Club and the Royal Geographical Society. Those present were drawn from the following places:

Canada
British Columbia: Kelowna, New Denver, Sidney, Victoria. Alberta: Calgary, Edmonton, Irricana. Saskatchewan: Regina, Saskatoon. Manitoba: Virden, Winnipeg. Ontario: Toronto.

England
London.

The Camp At Belgium Lake, Summit Of Palliser Pass. Photo, H. Pollard

United States
California: Los Angeles, San Francisco. District of Columbia; Washington. Illinois: Galesburg. Massachusetts: Boston, Cambridge. Michigan: Ann Arbor. Minnesota: Minneapolis. New Hampshire: Orford. New York: Brooklyn, New York. Oregon: Portland. Pennsylvania: Philadelphia.

The following passed the test for Active membership:

July 31, Mt. Tipperary.
W. J. Campbell. A. Garvin. L.C. Geernaert. C. H. G. Mann. G. W. Rae. Miss M. M. Berry. Mrs. H. S. Hall, Jr. Miss R. Whitman. Miss M. E. Porter.

August 3, Mt. Back.
Mrs. E. V. Huntington, Miss E. M. Valens, A. B. Hildreth, B. D. Watchler.

August 4, Mt. Tipperary.
Miss O. C. Primrose.

August 4, Mt. Jellicoe.
Miss M. P. Hendrie.

August 6, Mt. Maude.
D. Adams, W. Gillespie.

August 7, Mt. Back.
J. C. Boyle. W. E. Fenton.

August 8, Mt. Tipperary.
W. J. Taylor., Miss D. S. Brownwell.

August 9, Mt. Tipperary.
J. G. Dunn, A. E. Heighton, S. C. Murison.

Annual Meeting, 1922.

The Annual Meeting of the Alpine Club of Canada for the year 1922 was held at Palliser Pass Camp on August 5th, 1922. In the absence of the President, the Director took the chair.

The minutes of the Annual Meeting of 1921 and of the General Meeting held in Victoria, Feb. 11, 1922, were adopted.

The Director then read the President's address.

The President expressed his regret at the impossibility of his being present and his pleasure at the continued vitality of the Club. He appreciated the activity of the majority of the Local Sections and hoped the issue of the Gazette would keep them in close touch.

He outlined the new business to be brought before the meeting and urged appreciation of the illimitable possibilities of the Club.

The Director then delivered his address.

He stated the Club was in a stable condition and was recognized the world over as the

representative institution of the Canadian Rockies.

He expressed appreciation of the presence of Mr. A. L. Mumm. Sir James Outram, Dr. Nichols and other official representatives of the mountaineering Clubs of the United States.

Like all mountaineers he regretted the non-success of the Mt. Everest expedition and noted that the Club had been represented in that of 1921 by Major E. 0. Wheeler, and of 1922, by Capt. T. G. Longstaff and Dr. A. W. Wakefield. He hoped that the conquest of Mt. Logan, the highest mountain in Canada, might be achieved before many years had elapsed.

He alluded to the events of the Club's year and expressed appreciation of the assistance from many quarters tending to the success of the Camp.

The Secretary-Treasurer then read the address of the Hon. Treasurer, who regretted that urgent private affairs prevented his being present to turn over the reins of office to his successor. He had appreciated the advice and criticism he had received from the members and asked for support for Ms successor. Few realized the responsibilities and downright hard work necessary to ensure the success of the Club's undertakings.

Messrs. K. D. McClelland and F. W. Godsal presented the scrutineers' report of the ballot for Officers of the Club, which was adopted.

The meeting then turned to new business.

Authority was given to the new Hon. Treasurer to sign Club cheques and carry on the usual details of the banking business in place of Major Walker.

The question of the Annual Club dues was discussed and a schedule drawn up to be voted upon by the members of the Club.

Similar action was taken in the matter of reinstatement of former members.

The Waterton Lakes Irrigation scheme was then discussed and a Motion passed deploring the destruction of the natural beauties and of a park which the Government had already decided should be set aside for the benefit of the public.

The question of holding a competition of water color paintings on the lines of the photographic competition was left for further consideration.

The Minneapolis members petitioned that they might be allowed to form a Section. This matter was referred to the incoming Executive.

The proposal that hereafter the Executive Board be composed of the Officers and Chairmen of the Local Sections was discussed and the decision was arrived at that it should be submitted to the ballot of the members.

Several matters concerning the Photographic Committee and the Competition were discussed.

A special Vote of Thanks was passed to Major W. J. S. Walker, the retiring Hon. Treasurer, in recognition of the strenuous work he had so long carried on for the benefit of the Club.

A message of sincere regret at the absence through illness of Major E. O. Wheeler was passed on the motion of Sir James Outram.

The usual votes of thanks were passed and the meeting adjourned.

Club House Report, 1922.

The Club House guests began to arrive somewhat later than in 1921, but the house was never empty during the season. The familiar climbs were made, but nothing original was attempted.

Many visitors came from the hotels to get mountain information and to correct the interesting and remarkable '' facts'' which had come in their way. Members of foreign Alpine Clubs always

call upon the Club when in Banff and are gladly welcomed.

The Club Memorial to its members who fell in the Great War, twelve in number, is now placed upon the Club House wall. It is surmounted by the Club Badge and Motto, and the inscription is surrounded by a wreath of oak and maple leaves with the rose, the thistle, the maple leaf and the shamrock at the four corners. It was designed and executed by Mr. A. Scott Carter of Toronto, and, as the illustration shows, possesses a beauty and originality which render it distinctive.

Major E. 0. Wheeler presented two very fine enlarged photographs, taken by himself on the Mt. Everest Expedition of 1921, showing the mountain from above the 20,000 ft. camp in the Kharta Valley, and Mt. Makalu. Mr. H. F. Lambart gave a very striking enlargement, taken from the air, showing the north face of Mt. Robson and Berg Lake. Mrs. Daniel Davies gave a beautiful water-colour painting from her own brush—'' The Sisters of the Selkirks.'' The assembly room is greatly improved by charming new curtains presented by the Calgary Section, and a pair of handsome andirons given by Mr. and Mrs. Maxwell. Mr. S. H. Mitchell gave new curtains for the library and writing room. Mr. Wates and Dr. Bulyea have presented the very fine rock crystal found by them on Mt, Geikie, alluded to on page 61 of this volume. It rests on the assembly room mantelpiece near the lucky stone.

The guests at the Club House were drawn from the following places:

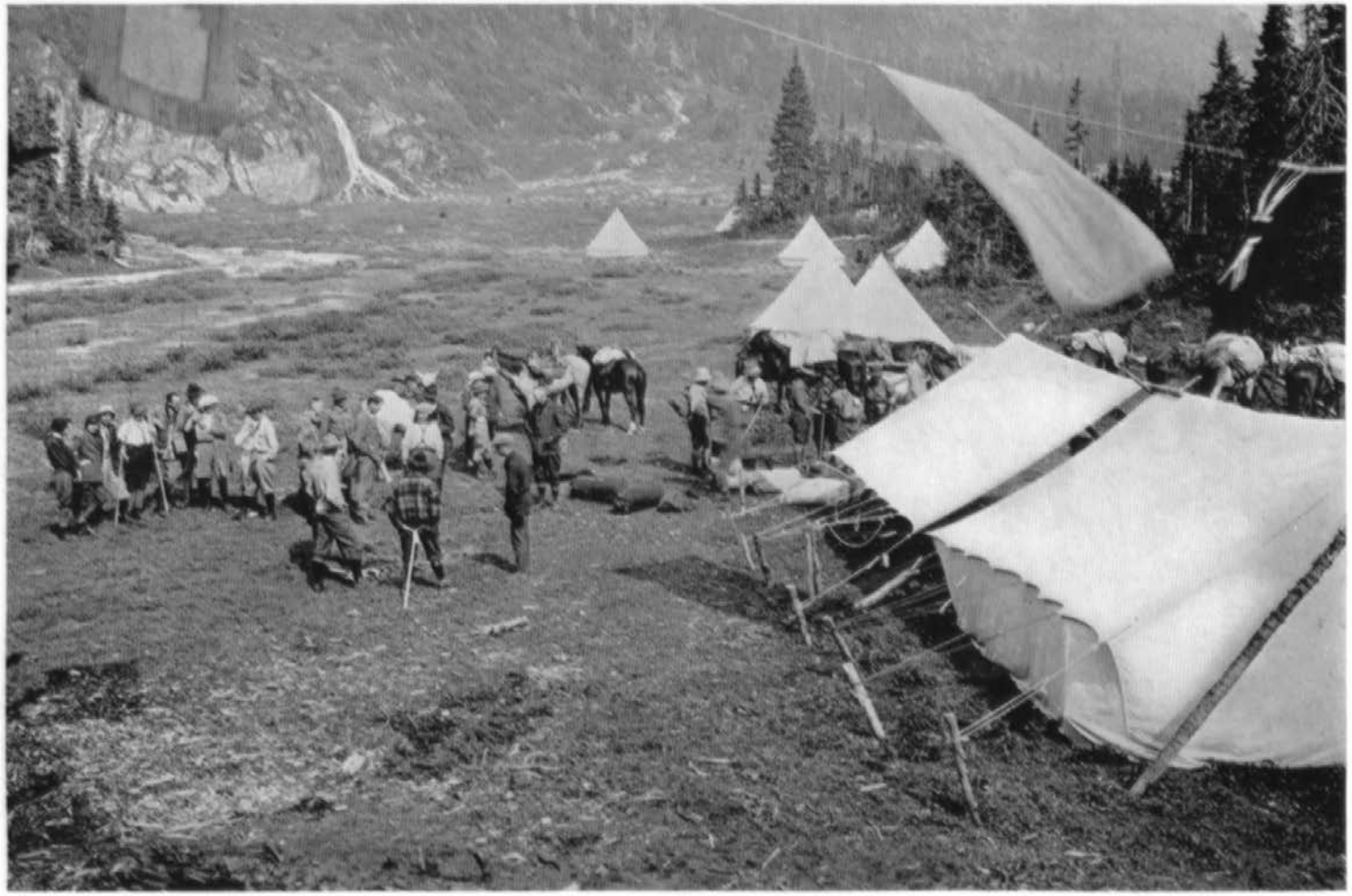
Canada
British Columbia: Kelowna, New Denver, Sidney, Victoria, Wilmer.
Alberta: Banff, Calgary, Coronation, Edmonton, Innisfail, Irricana, Lethbridge, Vulcan.
Saskatchewan: Regina, Saskatoon.
Manitoba: Virden, Winnipeg.
Ontario: Exeter, Georgetown, Kitchener, Toronto, Windsor.
Quebec: Montreal.

England
London.

India
Dehra Dun.

Australia
Adelaide.

United States
California: Los Angeles.
Connecticut: New London.
District of Columbia: Washington.
Illinois: Galesburg, La Harpe, Salisbury.
Indiana: Anderson.
Massachusetts: Boston, Cambridge, Milton, New Bedford, S. Ha41ey.
Minnesota: Minneapolis.
New Hampshire: Franklin, Orford.
New Jersey: Summit.



The Camp Commissariat. Photo, H. Pollard

New York: Brooklyn, New York, Richmond Hill.
Oregon: Portland.
Pennsylvania: Philadelphia.
W. Virginia: Huntington.

Report Of The Photographic Committee.

The Photographic Competition was not as numerously contested as the former year, but the average quality was good. The winners were:

Class A. Challenge Cup. For the best set of three enlargements to illustrate the following titles: "Mountain and Forest," "A Canyon or Mountain Torrent," "An Ice-fall." Won by T. 0. A. West.

Class B. For the best enlargement of a Canadian Mountain Landscape. Won by T. 0. A. West.

Class C. For the best picture to illustrate "Freaks and Curiosities of the Mountains." Won by D. J. M. McGeary.

Class T). For the best set of three pictures to illustrate the flora of the Canadian Mountains. Won by Mrs. MacFadden.

Class E. For the best set of six pictures to illustrate the 1921 Camp of the A.C.C. Won by D. J. M. McGeary.

The valuable photographic collection of the late Dr. W. E. Stone has been presented to the Club by Mrs. Stone.

There are five albums of views by Dr. W. E. Stone illustrating the various Camps at which he and Mrs. Stone were present and also expeditions made by them. There are also eight albums of views by the late F. W. Freeborn illustrating his experiences in the Canadian mountains.

In addition there are 225 lantern slides covering their travels in the various regions visited.

The very grateful thanks of the Club are presented to Mrs. Stone for this extremely valuable and comprehensive gift, which contains the history of her own and Dr. Stone's association with the Club.

A selection of seventy-five enlargements taken from among those submitted in competition during the last few years was sent to England during the winter. It was exhibited at a meeting of the Alpine Club in its gallery, and also by the Royal Photographic Society. It gained the interest and appreciation of the public generally for ''an extraordinarily beautiful collection.'' It was subsequently exhibited at several points in Eastern Canada and the United States.

Contributions of slides have been received from the Saskatoon and Toronto Sections. P. L. Tait has contributed seven hand-coloured flower slides and M. D. Geddes a slide of Abbot Pass which was needed to fill out this section of the collection. A catalogue of all the slides will be available in the autumn of the year.

Much appreciation is due to the energy and assiduous work of the Chairman of the Committee, Mr. C. G. Wates, who has done so much to enliven the photographic interests of the Club.

The Club Library.

The Club Library grows from year to year both by purchase and the kind gifts of friends. New bookcases are badly needed.

Among books we should like to possess are:
Below the Snow Line. By Douglas W. Freshfield. (Constable. 18s.)
Climbs on Alpine Peaks. By Abate Achille Ratti. (T. Fisher-Unwin. 8s. 6d.) This account of first class climbs made by the present Pope in earlier days is translated by Mr. J. E. C. Eaton, Hon. Secretary of the Alpine Club and also a member of our own.
Barren Ground of Northern Canada. By Warburton Pike.
The Pyrenees. By H. Belloe.
Life of De Saussure. By Douglas W. Freshfield. (Edward Arnold.)
Trailmakers of the Northwest. By Paul L. Haworth. (Harcourt, Brace Co.)
The Wilderness of the Upper Yukon and The Wilderness of the North Pacific Coast Islands. Both by Charles Sheldon. (Charles Scribner & Sons.)

The list of additions follows:
Autobiography of John Macoun, Explorer and Naturalist. Purchased. (Reviewed on a previous page.)
Baedeker's Guide to Dominion of Canada. Pres. by Publisher, T. Fisher-Unwin.
Contains much valuable information, but has not the accuracy of former editions, in details of importance, e.g.: Rooms cannot be obtained at C.P.R. Hotels for $2.50. Mt. Stephen House is no longer a C.P.R. Hotel, but a Y.M.C.A. Headquarters. Steamers have long since ceased to run between Golden and Windermere. Winnipeg will be surprised to know that it gets its water supply from a lake 1,000 miles to the north; and so on. It is possible the editor has not. realized the importance of the Western Tourist, travel and devoted his attention more especially to Eastern Canada. To be of real service it should be brought up to date.
Ball's Alpine Guide, Edit. A. V. Valentine Richards: Central Alps, Pts. 1 and 2; Western Alps. Purchased.
The Call of the Mountains. By Le Boy Jeffers. Reviewed on a previous page. Pres. by the author.
Samuel de Champlain, Works of. Vol. 1 and Portfolio of Maps and Plans. Subscription.
Buendner-Alpen. Vol. 4, Suedliche Bergellerberge, Monte Disgrazia. By H. Buetter. Reviewed on a previous page. Presented by Swiss Alpine Club.
Alpes Valaisannes. Vol. 2. By Dr. H. Duebi. Presented by Swiss Alpine Club. Reviewed on a previous page.
Comptes Rendus Congres de I'Alpinisme, Monaco. This official report contains matter of interest for mountaineers from cover to cover. Our own Club bulks largely. We have six papers in the Scientific Section and one in the Historical Section. There are also a large number of illustrations. The report goes all over the world and will spread the fame of the mountains of Canada.
Mont Blanc, Panoramas. By P. Helbronner. Presented by Prof. Emm. de Margerie. A portfolio of magnificent coloured panoramas from and in the neighborhood of Mt. Blanc.
Mount Everest, The Reconnaissance, 1921. By Lt.-Col. Howard-Bury and other members of the Expedition. De Luxe edition; members' subscription. Ordinary edition presented by J. Brunner and Le Boy Jeffers. Reviewed on a previous page.
Mountaineering Art. By Harold Raeburn. Presented by I1. N. Waterman. A handbook of great practical value.
The Northwest Company. By G. C. Davidson. Purchased. A carefully documented history of the Company and the early fur trading days.
Winthrop Ellsworth Stone. Presented by Purdue University. A book of appreciations of the different

phases of character of a distinguished and attractive man, a member of the Club from 1911.
A Flora of the Rocky Mountains and Adjacent Plains. By P. A. Rydberg. Presented by Dr. F. J. Lewis. Reviewed C. A. Journal Vol. IX., 1918, p. 158.
Mount Garibaldi Park. By Don Munday. Presented by the author. An interesting and informative handbook to British Columbia's new Park, with map and many illustrations.
Round About the Rockies. By C. W. Stokes. Presented by the author. An attractive handbook to the Mountain Parks of Canada. Containing a great deal of practical and accurate information in a small compass. The maps are clear and the illustrations pleasing, though line would give the character of Mt. Assiniboine more effectively than colour. Such a book has long been needed.
Through the Heart of the Rockies and Selkirks. By M. B. Williams. Presented by the Commissioner of Dominion Parks. A more elaborately produced book than the former, containing much information, and written more for the reader than the wayfarer. The illustrations are excellent and there are maps of three of the most frequented parks.
Peaks, Passes and Glaciers. By Members of the Alpine Club. Presented by A. L. Mumm. This lineal ancestor of the Alpine Journal is composed of articles dealing with the early days of British mountaineering of the greatest interest.

Dr. W. B. Ladd has presented us with numerous back volumes of the Journals of the Sierra Club, Scottish Mountaineering Club, Yorkshire Ramblers' Club, Cairngorm Club, Fell & Rock Club, and the Rucksack Club. The Norwegian Touring Club has also sent us a number of its Journals in exchange for our own.

The Rucksack Club Journal has been added to our list of exchanges.

War Memorial At Club House, Banff. Designed, A. Scott-Carter, Toronto