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HEADQUARTERS
BANFF, ALBERTA

VOLUME II, No. 1

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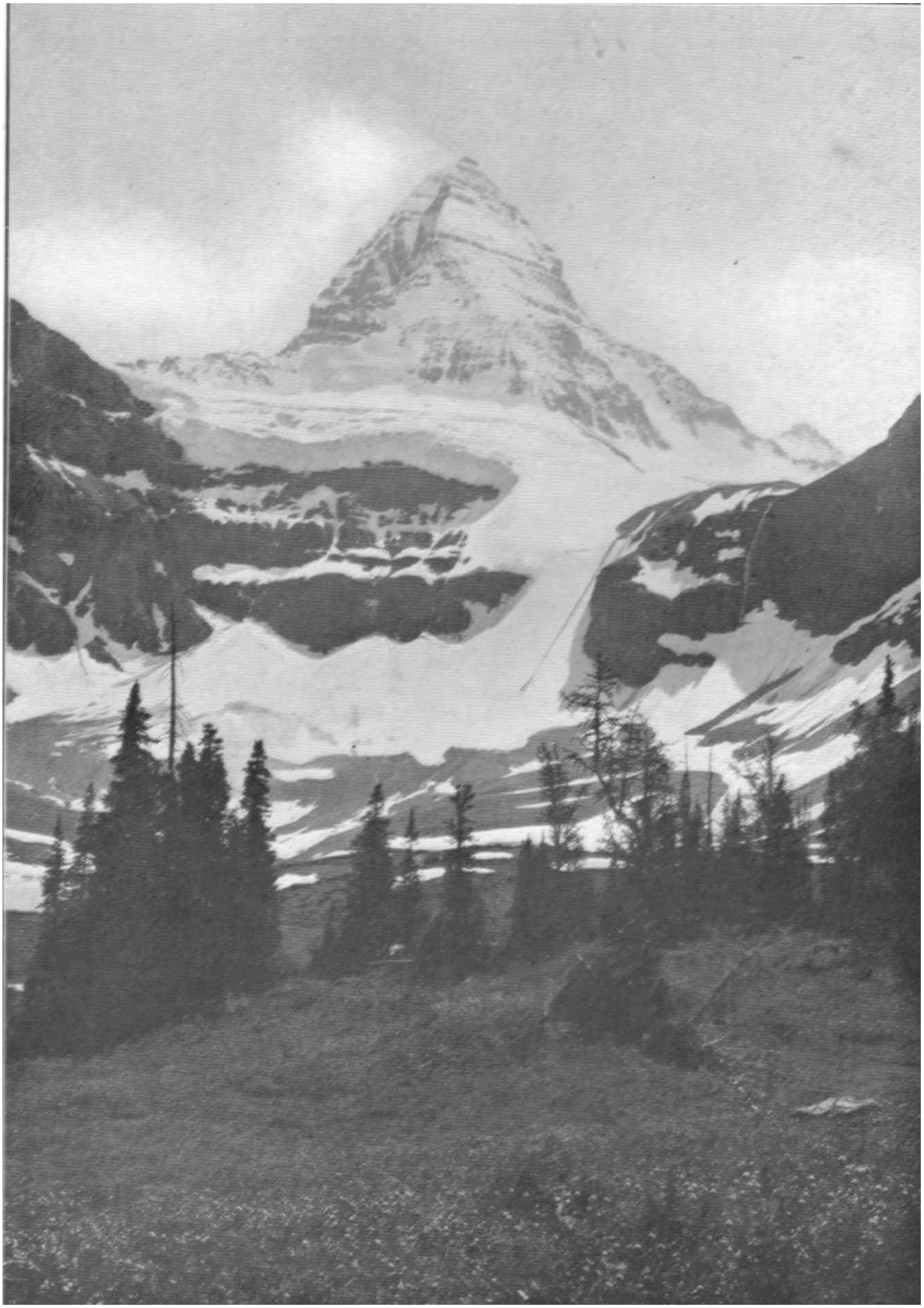

Mt. Assiniboine from the North. Photographed at Altitude 7500 Feet. W.D. Wilcox, Photo.

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Mt. Robson, 13,700 Feet From Mouth Of Grand Forks. Rev. G.B. Kinney, Photo

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MOUNTAINEERING SECTION.

Mount Robson.

By The Rev. G. B. Kinney.

Near the end of July 1907, our pack train of ten horses left Morley, Alberta, for Laggan, which was our real starting point.

The party consisted of Dr. A. P. Coleman, Geologist of the University of Toronto, his brother, L. Q. Coleman, of Morley, Alberta, myself, and a cook; all active, original members of the Alpine Club of Canada, excepting the latter. Mount Robson, the highest and grandest of the Canadian Rockies, was our goal.

For over a month we followed the trail of the wild through the valleys of the Pipestone, Siffleur, Saskatchewan, Sunwapta, Athabasca, Miette and Fraser, crossing the Pipestone, Wilcox and Yellowhead passes. Reaching the mouth of the Grand Forks of the Fraser, we had to chop our way through fallen timber and forest primeval till we camped near the base of the mountain. The hardships of our trip in had delayed us two weeks longer than we had thought.

The day after reaching the mountain we divided the party and spent one day in exploring to find the best way to the peak; then, with five days' provisions on our backs, leaving the cook to look after the horses, we set out to capture Mount Robson. On the evening of the second day, wet and cold, we made a tree-line camp in a snow-storm. Next day it was storming harder than ever, deep snow lay all around, and, much to our sorrow, we were compelled to give up the attempt. It had been storming more or less for the previous week and our time limit had long expired, so instead of being able to wait for fine weather, we had to abandon the chief object of our expedition, and we returned by way of Edmonton.

The next year we three met by appointment in Edmonton, where, on the thirty-first day of July, 1908, we were again in shape for our attack on Mount Robson. This time John Yates, the famous packer of Lake St. Annes, had us in charge. By August 28th our light pack-train of eight horses had made such rapid time that we were able to camp near the foot of the east side of the mountain. Two days later, August 3Oth, our permanent camp was made at the foot of a mighty glacier we found lying there.

For nineteen days expedition after expedition was made to capture the peak of Mount Robson; and for nineteen days storms and blizzards of snow frustrated our every attempt. We explored and photographed and mapped the whole region for miles around. We captured three virgin peaks. On the east, however, the fallen snows are so protected that they rest on the mountain from base to summit, giving birth to the fine Robson Glacier, six or seven miles in length.

For hours we scrambled up this river of ice, amid its séracs and crevasses, till we came to the real climb itself. At one time, the heaped-up snows of ages had packed that east side of the mountain to an enormous depth, completely burying those awesome walls of rock, and offering a gradual slope of 45 degrees. But a few years ago the whole mass, for thousands of feet up, had

Robson Glacier Six Miles In Length. The Watershed Between Alberta And British Columbia Lies Up Its Centre. Rev G.B. Kinney, Photo.

Berg Lake At Foot Of Mt. Robson. Named By Mr. Kinney. Rev G.B. Kinney, Photo.

taken a sudden slide of a few yards, and in that fearful tumble completely ruined the continuity of its beautiful slope. Gigantic cliffs of clear blue ice, each rising sheer for hundreds of feet, are now ranked in line one above another to the very skies. Great yawning crevasses, hundreds of feet deep, scar and chasm the whole mass in every direction, while huge chunks of crystal, as large as cathedrals, lie thickly strewn on every hand.

All day long we mushed through the soft snows, or cut our way up these walls of ice. The day was perfect, but we had started several hours too late and the soft snow was too much for us. Reaching an altitude of 10,500 feet by 2 p.m., we concluded to turn back, as it would be impossible to get to the peak that day. We reached our camp in safety after spending twelve and a half hours of hard work on ice and snow. Realizing our need of a higher starting point, the next afternoon we packed our blankets up the glacier and made our camp high on a medial moraine. But a great storm of rain wet us through that night and drove us back to our previous camp. Two days later the weather cleared again and we made our second camp high up the glacier, but the next morning brought a raging blizzard which drove us back to our permanent camp.

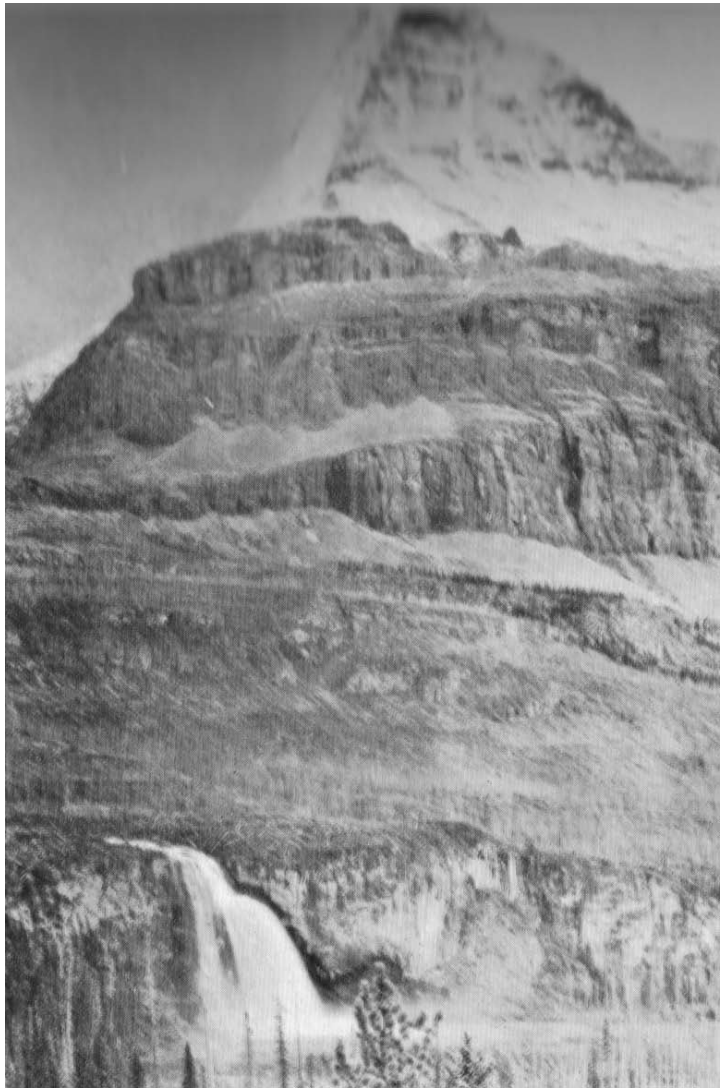
Our time limit had now about expired. It was too great a disappointment to fail again as we had last year, so I resolved, with the consent of our party, to try the steeper rock cliffs of the north side. The storm of the morning continued unabated all day, but by four p.m. I had said good-bye to my companions and alone started off in the storm to make my high camp. I crossed the gravel bed of the Robson Divide, then scrambled for another mile over the great rocks that strewed the shores of Berg Lake. The short day was nearly done by the time I had passed over the rock-strewn floor of the valley below the lake and bridged its turbulent river; then, for more than two thousand feet, I packed my load of blankets and instruments to a shelf on the cliffs, in mid air. I spent an uncomfortable and restless night on a bed of snow, for I was high above tree-line, and the cold wind found me even through my heavy blankets.

By the first light of dawn I was storming the heights. For thousands of feet, the great rock towered overhead, fringed and fretted with dripping icicles that hung in masses from the over-hanging cliffs, sometimes as much as fifty feet in length. Narrow slopes of shale, at the foot of each wall, were as difficult to traverse as the cliffs themselves, for I had to plough knee-deep through freshly-fallen snow.

I followed narrow snow-covered ledges that dwindled sometimes to but a few inches in width, while ever overhead hung those threatening lance-like icicles dripping their cold water upon me, for the warm sunshine now added these to other dangers. Ever and anon, with a report like a rifle, a chunk would break off from above and stab viciously into the narrow ledge near me, or vanish with a swift swish of flight into the silence of the gulf below. The steep, narrow chimneys in some places were so full of soft snow that I would wallow nearly shoulder-deep before getting a solid foot-hold, and at other times I frequently had to shovel a way through overhanging snow.

In one of the cliffs my path narrowed to a mere perpendicular crack in the wall. Up this I squeezed a way for a hundred feet, only to find a rock weighing about twenty-five pounds had lodged directly over head and held in check a small avalanche of stones and snow. With great care I removed the smaller stones, one by one; then bracing myself, I loosened the larger one and let it slip down over my back into the great stillness below. By ten-thirty the last of those cliffs, that had been deemed impossible, had been climbed, and I stood on the summit of the great north shoulder at nearly ten thousand feet altitude.

The day had begun fine and I had taken some splendid photographs, but now a wrack of clouds was already burying the neighboring peaks on a level with me or below, and, when I swung



North Shoulder Of Mt. Robson. The Cliffs Up Which Mr. Kinney Climbed To Top Of Highest Bluff On Extreme Right. Rev. G.B. Kinney, Photo.

Lance Like Icicles; Fifty Feet Long. Mr. Kinney's Footsteps May Be Seen In Snow On Little Shelf At Base Of Cliff. Rev. G.B. Kinney, Photo.

round the north shoulder to the west side, I met a screaming gale. It was beyond question the fiercest wind I ever met. Three different occasions while crossing a long, exposed shale slope, it literally blew me off my feet and tumbled me over; while there were times when I could not force my way against it a single step.

I followed this slope around to the west for nearly a mile, then for over an hour waited in the lee of a cliff, hoping the storm would pass, but, instead of subsiding, it added the lash of snow to its fury, and whipped around the jutting crags in a driving white spray. I then worked my way up protected gulleys and left cliff on cliff behind. But the increased force of the storm brought an evening that completely conquered me. I had climbed above the soft, loose snows of the lower levels and now had dry, solid footing. All the big cliffs had been passed, and I had only the smaller ramparts of the upper slope of the western side to conquer. The Fraser Valley swept in brief glimpses before me, and I was at least over seven thousand feet above the Grand Forks river below. The cliffs were so perpendicular that I was forced to follow the draws, and it was there that the enemy lurked. There were no big glaciers above or walls of ice to topple masses of debris upon me as on the east side, but in that blinding blizzard each and every couloir became a foaming cataract of hissing snow. At first it came in little dribbles, and cliff on cliff was left behind, but soon I was wading knee-deep in rushing torrents of dry, pulverized snow. There was no escaping it. I struggled on till I was over 10,500 feet altitude by the aneroid, but these torrents of snow were becoming avalanches, and to be swept off one's feet meant certain death. The wind and snow were too much for me. I would like to have made a camp there, in some sheltered nook, but I had promised my friends that I would be back that day, so with disappointed hopes I started on a difficult descent. At the first opportunity, at about the 10,000 ft. level, I built a cairn of stones and deposited the little message bottle I had hoped to leave at the peak.

I made rapid time returning, and glissaded the whole length of a two-thousand foot snow-slope. Leaving the snow-storms of winter above, I plunged through the clouds and found it raining hard. The rain had played havoc with a huge glacier in a hanging valley opposite. Just as I got below the clouds I was startled by a fearful explosion, then the whole face of the glacier crumpled up, plunged over the cliffs and swept into the valley. It took ten minutes by my watch before the ice boulders of the front came to rest in the bottom. I have watched Lefroy and Temple and other mighty peaks send crashing ice-falls into their peaceful valleys; I have seen great avalanches of snow plunge and billow down the mighty sides of Sir Donald, racing each other two and three at a time, as they eat up the forests in their paths, and stop all traffic on the C. P. R. for nearly a week; but the hurtling masses of that mountain of falling ice were simply appalling, and far beyond all my previous experience.

I had much difficulty in getting below the cliffs, but finally reached my cache of blankets on the ledge and hurried to the valley below. It was after dark before I saw the light of our camp fire through the storm; and oh! the hot stew of goat meat was great, after over thirty hours with nothing but cold lunches.

The next morning was so fine that instead of packing our ponies for our home trip as was planned, we resolved to have one more try at Mount Robson and then get home by forced marches. So that afternoon found us again in our temporary camp high up Robson Glacier, and the next day, Sept. I2th, dawned with the sky full of stars above glistening peaks.

Everything pointed to success that morning as we started for our final climb. The snow was hard and frosty and the footing proved so good that by 7 a.m. we had left behind the séracs of the glacier and had reached an altitude of over 10,000 ft. Some few years previously great cliffs of ice

had toppled over the edge of the gulf and made chaotic our pathway to the summit. Now we found that where we had toiled so hard a few days ago below the solid blue walls, an avalanche had swept away our path and buried our trail beneath a million tons of ice. Other broken and over-reaching masses hung suspended above our heads. Just as we reached the foot of the first cliff, a great mass let loose from above, missed us by scarce fifty feet. For one awful moment we held our breath; then we forgot the hurtling slides, although they continued their roar throughout the day. For an hour we cut steps up a wall of ice; then we chiseled a path around an overhanging cliff and sunk knee-deep in the now softened snows of its crest. For four hours and a half we literally hung on the face of that wall of ice, by finger and toe-holes only; and in all that time we gained not more than five hundred feet. Here, amid the wreck of a snow-white world we ate our lunch, and then for half an hour followed a chasm, crossed its frail snow-bridge, and swarmed up a lofty hillock of snow. Here chaos reigned supreme, for this was where the big snow-field had broken off. Above frowned walls of ice, fully a thousand feet high, while at their feet the snow but imperfectly covered the jumble of icebergs and their treacherous crevasses. We wormed our way amid these ruins and crossed great crevasses on little snow bridges; then, amid the drip of icicles, chopped our way up intervening cliffs till a rampart of ice walled out the view to the peak. A narrow slope of snow hung down those walls and shoved out a cornice far over a mighty bergschrund at our feet. The snow hung down to the level of our shoulders. I cut a couple of steps in the hard edge above my head ; then striking my axe into it as high as I could reach, I literally pulled myself up till I could place my feet in those notches. Then I cut more steps till I was the full length of the rope above the crevasse. Anchoring myself there, I waited till Dr. Coleman had footing in the snow, and then cut more steps. Thus, one at a time, the three of us gained the slope. From there we followed the steep winding valleys of snow, up almost inaccessible grades, crossed more crevasses and climbed other cliffs, till at last our rough boots ploughed the white, dry snow of the crest of the highest cliff, and but a narrow field separated us from the peak of the mountain itself. We had reached an altitude of 11,700 ft., and it was 4 o'clock p.m.

The peak rose "stern and steep" for two thousand feet or more above us, but it offered a possible though difficult slope of snow clear to the summit. After eating a lunch and burying a bottle containing our names in the snow, we started again, but a huge bergschrund separated us from the upper snows and, when we approached it, the whole field on which we stood gave a sudden lurch and settled a few inches, while masses of snow bridges fell into the widened crevasse. We could, by making a wide detour, get around this great crack, but it was decided that we had better give up the attempt, so we started back for camp. The downward trip was more or less uneventful. We glissaded the safer slopes and carefully retraced our line of steps cut in the cliffs. Sometimes the drip of icicles had filled the notches with ice, in other places the avalanche had swept away our pathway; but gradually we left behind the cliffs and snow-bridges and glided swiftly to the glacier below. It was scarcely dark by the time we reached our little camp. We had spent more than fourteen hours amid the fearful glories of that splendid mountain.

In fifteen days we were again in Edmonton and the joys and dangers of our desperate climb are now but happy memories.

EDITORIAL NOTE.

The strong feature of the foregoing narrative of the series of attempts made by Dr. A. P. Coleman, L. Q. Coleman and the Rev. G. B. Kinney, during two successive years, to reach the summit of Mount Robson, is the plucky and desperate climb made by Mr. Kinney alone, when one

Walls Of Ice, A Thousand Feet High. Rev. G.B. Kinney, Photo.

“For Hours We Hung On The Wall Of Ice”. Rev. G.B. Kinney, Photo.

night was spent on the mountain.

It will be noted that Mr. Kinney states he would have spent a second night but for a promise to his companions to return. The succeeding day was fine, and, had he done so, he would undoubtedly have reached the summit and have made the first ascent of this noble peak, a conquest he richly deserved.

All honor is due to the party for its magnificent efforts and, in extending our sympathy to those concerned for a lost fight, against adverse weather conditions, we sincerely hope that Mr. Kinney may be successful in his next attempt.

An Early Attempt To Climb Mt. Assiniboine.

By Walter D. Wilcox.

On July I2th, 1895, amid the soft glow of a setting sun, I reached the summit of a barren pass, surrounded by everlasting snow, and looked eastward into a deep, forested valley, and southward over strange snow-fields and mountains. The distant peaks were indistinct in the purplish haze of forest fire smoke, and there was a silence of a perfect calm, that silence only found in the mountains high above tree-line. Whether the white man had ever stood here before and looked upon this scene, I knew not, but the mountains were marvellously impressive in their solitude. As the lengthening shadows crept over the rocks, and ice needles began to shoot across the pools, I remembered that it was many miles to camp, and regretfully bent my steps in retreat, but not without a last lingering look at a sharp, wedge-shaped peak, to the south, rising above snow-fields and crevassed glaciers and then falling away into a great wall of rock that I knew culminated a few miles northwards in Mt. Assiniboine.

After nearly a week of marching we had, that very day, enjoyed our first view of the wonderful mountain and our camp was now located at its northern base. The account of my experience, round the evening camp fire, excited my friends, and our plans were made forthwith to spend the following day in exploration. The next morning dawned clear and cold and a change of wind had swept away every trace of smoke and left an azure sky. At an early hour, Barrett, Porter and I were on foot, with lunches and cameras, and after skirting the ice-berg filled lake at the foot of Assiniboine, turned eastward and began to ascend a broad, open valley, full of small lakes and running streams, interrupted here and there by water-falls and miniature canyons, beautified by clumps of larches, and hemmed in to the south by a curious, castellated ridge, bristling with gendarmes and rock towers. Arrived at the pass summit, which is a part of the continental watershed, dividing the sources of the Spray from the last rivulet of the Simpson River, we ascended an easy peak on our left and there, at an altitude of about 9000 feet, looked upon a magnificent panorama of the entire Assiniboine system, now seen from a totally new point of view. This face is a nearly vertical wall, and its outline is more blunt than from the north showing also a remarkable buttress on the south arête. The great ridge extending southward rises into two high peaks, one of which seemed nearly, or quite 11,000 feet in height. In the surrounding valleys we counted more than fifteen lakes, while below us to the left was a chain of three, whose total length could not have been less than four miles.

The day was only well begun, the weather glorious, and, filled with enthusiasm engendered by such inspiring scenery, and the novelty and suddenness of the unfolding, we began to discuss the idea of descending into the valley of lakes. Barrett said he preferred to spend an hour or two on the peak, studying the mountains with his field-glass, and after wishing us good luck and persuading

us to carry his revolver, as we all expected to meet grizzly bears in those days, Porter and I rapidly descended the long scree slopes, and then, turning eastward, plunged into the depths of the forest. Here in the stream bed we saw the skull and horns of a Bighorn where, years ago he had lain down for his last sleep. At length we came to the borders of the lowermost lake, some three thousand feet below our recent outlook point. We were surprised at the great size of the trees and found no little difficulty scrambling through the under-bush and over the decaying and moss-grown trunks. The sombre darkness of the forest, and Barrett's final warning about grizzly bears, and his idea that we were liable at any moment to stumble over one of these sleeping monsters, made us expect unseen dangers from every particularly dense mass of underbrush. Reaching the lake end, we followed up the inlet stream, and presently hearing the sound of rushing water, came suddenly upon a fine waterfall. Some lively scrambling amongst rock ledges and forest was rewarded by our reaching the second lake, the remarkably pure and clear water of which was surrounded on every side by muskegs and pools, where we had to give up all idea of dry feet, and, in some places, were glad to progress at all. We were disappointed with the view and so pushed on, in an endeavor to reach the third and last lake, and after a trying battle with the dense timber, finally succeeded. As the water of this lake began to appear through the trees, we could see Mt. Assiniboine rising in glacier-clad cliffs and vertical walls, nearly six thousand feet above us, making a most impressive view. I tried to level my camera amongst the logs and stumps, stranded along the shore, and get a photograph. Myriads of mosquitoes nearly baffled every effort and the resulting negative shows a horizon far from level. At length, retracing our steps, we climbed the two thousand feet to the pass and reached camp tired, but most satisfied with our day's work.

This excursion, which led to our circuit of Assiniboine a few days later, where we saw the south side of the mountain and got a good idea of its radiating spurs, led me to believe that Assiniboine would be climbed only by its southern slopes. The most feasible way to reach that side was to reverse our circuit of the mountain, taking our horses down the North Fork of the Cross River, then, after climbing an intercepting ridge, place a bivouac at the mountain's base. Time and circumstances brought this question to the test six years later. So it came about, that in July, 1901, Mr. Henry G. Bryant and I had perfected plans for a double purpose, first to make an attempt to climb Mt. Assiniboine and secondly, to penetrate as far as possible into the great white area on Dawson's map, south of the Kananaskis Lakes, marked with the magic word "Unexplored," that most fascinating and suggestive of all names to any lover of the wilderness.

We arrived at Canmore on the night of the 22nd, accompanied by the Swiss guides, Edouard Feuz and Fritz Michel. Canmore, known to the casual visitor for its coal mines, its dairy supplies, and more important still, as the place where the observation car is put on, is a little village whose scenic charm grows with acquaintance, in a manner very surprising to those who only know it from a passing train. Broad, grassy meadows, and the swirling river, with many a pool and quiet back-water to reflect the green forests and grey mountain peaks, give a beauty, that with a little encouragement from the hand of man, would make a resort similar in many respects to Banff. The hotel however, is not up to the standard of the inspiring scenery, but such poor accommodation as it offered we had to accept for the night, as our outfit of men and horses was awaiting us miles away in the valley of the Spray.

The next day witnessed the start of an expedition that eventually proved most interesting and successful. To save time and energy with our many packages and unwieldy burdens we engaged a wagon to transport ourselves and baggage the first three or four miles towards the pass in the mountains, locally called the White Man's Pass, though indeed, it is only the first gap and the real

Southern Spurs Of Mt. Assiniboine From North-East. Photographed At Altitude About 9000 Feet. W.D. Wilcox, Photo.

pass lies some forty, miles farther west. The top of this break in the long ridge that extends to Banff in one direction, and many miles in the other, is a wild pass, full of broken limestones, silent and mysteriously impressive, partly from a certain grandeur of cliffs rising above the narrow trail, and partly also from the abrupt change from the frame buildings and coal mines of Canmore, to the solitude of the untrammeled wilderness.

Winding along the narrow pathway, our little company made a striking though motley appearance, the Swiss guides and one of our men struggling under the several clumsy packages that made up a folding boat, in which we hoped to explore many an unknown lake in the mountain fastnesses, while Bryant and I were cumbered with rope, ice-axes, cameras, and all those odds and ends that, by some fatality or other, never seem to be ready for the original start of the pack-train. Shortly before the lunch hour we were descending the western slope in the valley of the Spray and after passing through a green forest, came to the encampment of our men. There is something peculiarly delightful in the first day's camp, but to come upon it suddenly, and find it all prepared, the tents and great teepee for the men set up, the fireplace in order, with a line of buckets each hanging from its hook, and sending clouds of steam and savoury odors into the forest air, the plates and dishes already set out on the canvas table giving promise of the coming meal, is indeed the height of wilderness luxury. In every detail of the camp there were evidences of the competence and ability of our men, and it would have been a difficult matter to have found a more capable lot, a fact that justly gave us confidence as to the results of our explorations. Ben Woodworth, endowed with bubbling good humor and an unlimited fund of anecdotes, swinging his axe with accurate and powerful strokes, kept the woodpile always replenished and the fireplace a joy to gather round. Jim Wood, experienced as a packer, and Tom Lusk, ever industriously mending his saddles and keeping his equipment in perfect order, proud of never having a sore-backed horse, even when marching through the roughest country, made up our trio of men who were to look after our horses for many weeks to come. All were soft spoken, using the low, mellow notes of the true backwoodsman, acquired amid the silence of forest depths, and each one could replace the other in packing, cooking, or wielding the axe.

Marching some three hours that afternoon we continued the next day along the shores of the Spray Lakes. At the end of the first lake there is an old log shack and here, pausing a few moments to make some readjustment of a pack, we all dismounted for a short rest. And now an accident occurred, most unfortunate to our chances of reaching the summit of Mt. Assiniboine, though we were loath to admit it at the time. Michel, in mounting his horse, either allowed the nail shod toe of his boot or the point of his ice-axe to prod his horse, so that he was hardly in the saddle before he was bucked off, head first, falling heavily to the ground. He narrowly missed striking some broken glass bottles. He rose at once, dancing round in agony, but Edouard immediately divining that his shoulder had been dislocated, with a powerful pull, snapped it back into position. Michel, though in great pain, had the sand to ride the same pony the rest of the day.

The mountains were full of clinging mists, and as the day advanced the heat became intense, both of which facts augured a break in the weather. We passed the last of the lakes and, fording the swift running Spray in safety, rode for miles through burnt timber, till we came at length to the forks of the river, where the stream that rises at the base of Mt. Assiniboine joins that from the White Man's Pass. Here, in a clump of green timber, we established a permanent camp and separated that part of our provisions and outfit that was needed for our attempt on Assiniboine.

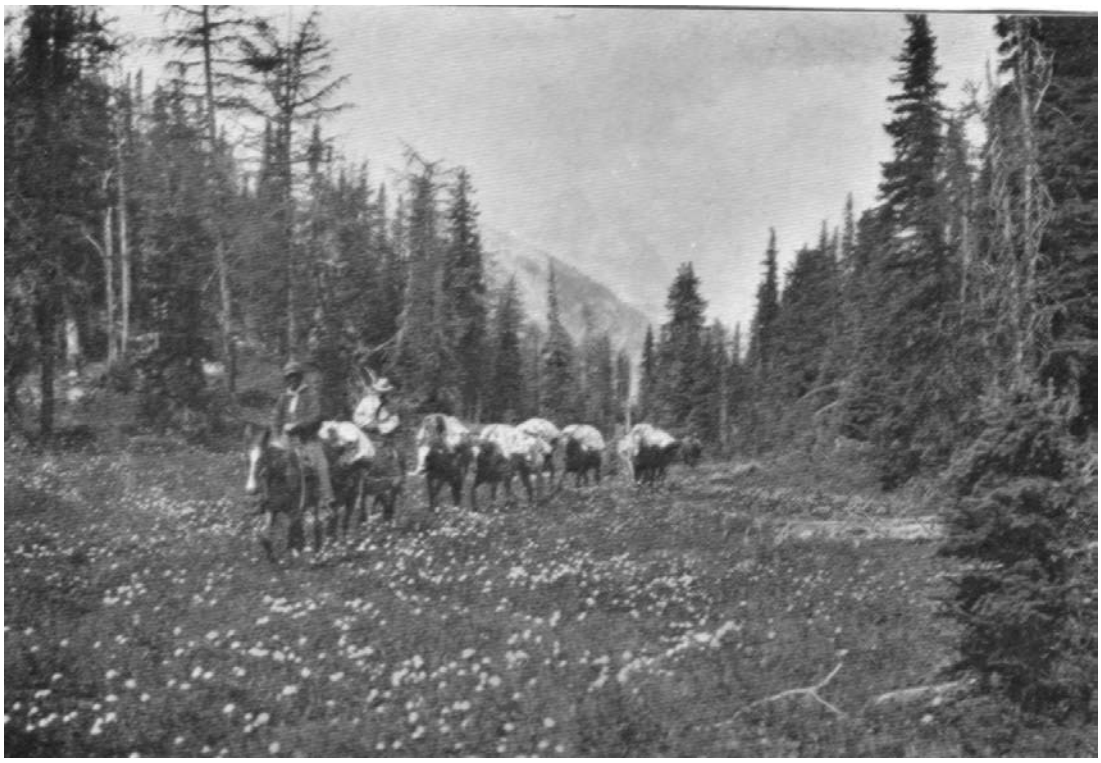
The next day, leaving Ben Woodworth in charge of this camp, though much to his apparent regret, we continued up the Spray River, now in a northwesterly direction. Fritz Michel accompanied

us, not that we had any hope of using him on the mountain, for his arm, almost black from shoulder to wrist, was now swollen to twice its size, so that he could no longer pull on his coat sleeve, but rather to afford him a certain amount of exercise and excitement, that might prove beneficial.

After an hour and a half we got our first view of Assiniboine. The long wooded valley nearly filled with the chain of lakes which I had first seen six years before, now opened up on our left and allowed us a fine view of the precipitous wall which culminates in the impressive peak that we were soon to see from a more striking point of view, and finally attack on its opposite side, after making a circuit of nearly forty miles from our present position. Thus far our journey had been through continuous burnt forest, making probably the most monotonous and least interesting of all trips in the mountains. But now we enjoyed one of those sudden transformations that make the Rockies so interesting, for, reaching the end of the burnt timber, and ascending a low knoll of limestone, we looked down upon a green meadow full of wild flowers, where the reddish horse-sorrel, the blue-black larkspur, and scarlet painted-cups, made a strange combination of colors. Under a limestone ledge we saw an immense pile of the flowers of the painted-cup, probably gathered by some marmot for his winter store. About half a mile distant eight mountain goats were quietly browsing, perfectly unaware of our presence. Jim Wood set off with a rifle, and after a long and careful stalk, missed hitting anything, not at all to our regret, as we had our larder well stored and were in no need of game. The goats clambered a thousand feet or so up the mountain side and could be seen from our camp several hours later. The intense heat and southerly breezes of the past few days culminated in rain that afternoon. However, I improved the opportunity to explore a pass lying to the north of our camp, which for several years I had hoped might prove a shorter route to Mt. Assiniboine than any hitherto discovered. Though Mt. Assiniboine is not twenty miles from Banff, as the crow flies, the long unbroken ridges make detours, and a journey of several days, necessary to reach its base. A hard hour's work, traversing a steep hillside through fallen timber, brought me to an old Indian trail, following which I came to an upland valley, and after a walk of two miles saw some teepee poles that had been used not long before. Then turning northwesterly I came at length to the summit of a pass 7,850 feet in altitude. Two piles of stones, apparently of Indian origin, marked the route along the highest crest. On the other side I looked down into a green valley between very sharp and jagged ridges, running slightly east of north, and then about five miles distant another valley opened up at right angles. This no doubt is some part of Healy's Creek and if the lower part of the valley is not impassable from burnt timber, this route is feasible and possibly shorter than any other to Mt. Assiniboine. Heavy showers of sleet and rain now began to fall, and after working through the wet brush for several hours, I reached camp soaked through and chilled to the bone. In the night there was more rain and heavy thunder.

Though it was still raining in the morning we packed up and climbed the pass out of the Spray valley and entered the extensive moors north of Assiniboine. The clouds rolled away in masses and revealed the great mountain in a dazzling coat of new snow. Passing the chain of beautiful lakes that conspire to make this one of the most attractive spots in all the mountains, we continued to the west, descending into the burnt timber of the Cross River valley. Here the surroundings were more desolate, and nature frowned in sympathy, the clouds deepened and rain fell in continuous showers that made us thoroughly miserable till we had turned in for the night. Our tents were placed on the shore of the deep-blue lake which rests against the ice-covered cliffs of Assiniboine's northwestern spurs, where Mr. S. E. S. Allen had camped in 1895. What made us more depressed was the certainty that these heavy rains meant ever deepening snows on the chill heights of Assiniboine's upper cliffs. In fact, the rain was so continuous and heavy the next

On The March. W.D. Wilcox. Photo.

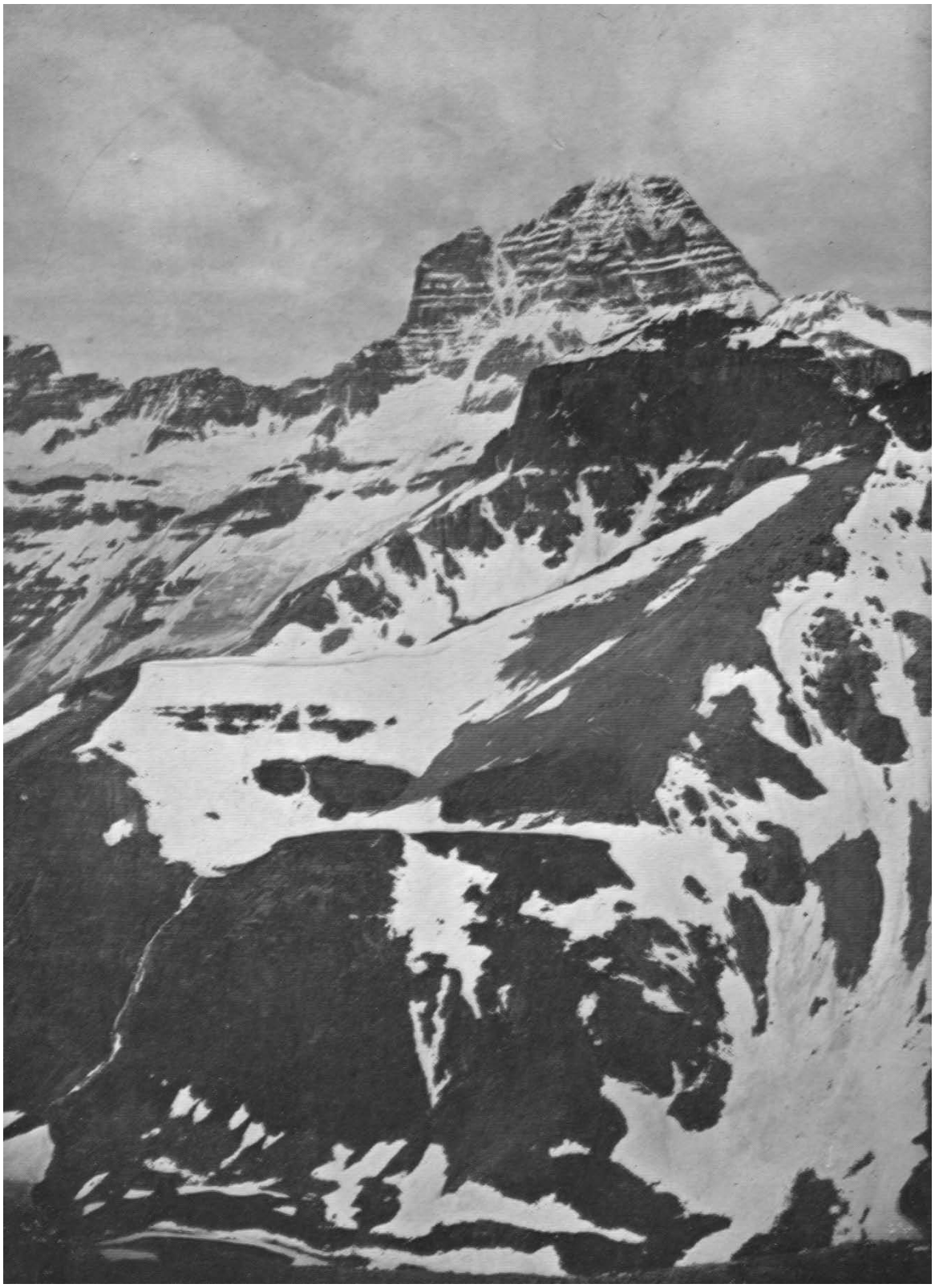


Camp North-East Of Mt. Assiniboine. W.D. Wilcox, Photo.

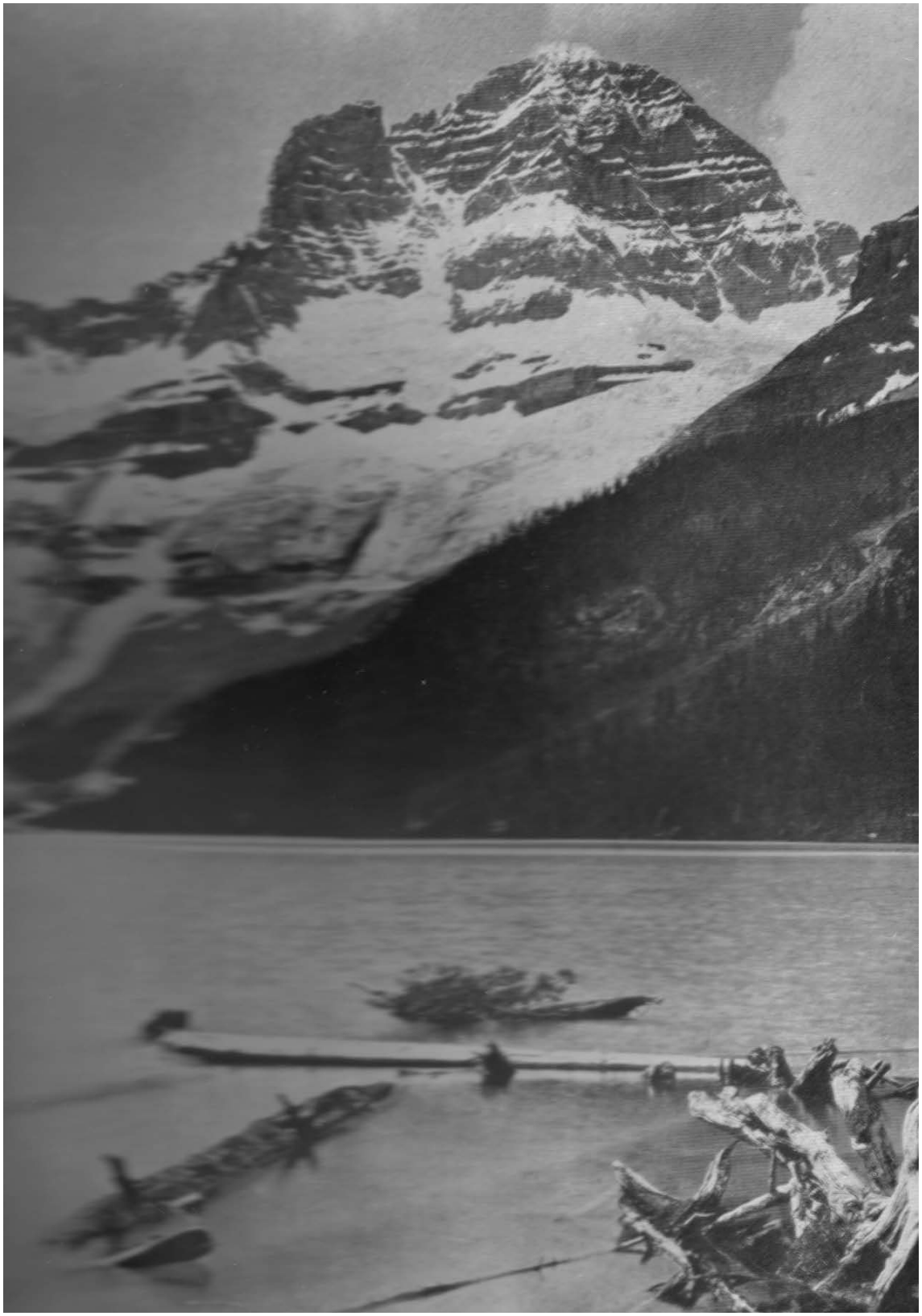
morning, that there was no thought of packing up till about noon, when a slight turn for the better tempted us to march again. But, lost in the mazes of burnt timber, where few if any horses had ever passed before, we made very poor headway, and, at length, coming to places where the trail had been washed away by the rushing river, now at the north-west corner of the Assiniboine group, we were forced into the trackless depths of a mossy forest. Chilled by the continuous showers, while the men were chopping through the logs and water-soaked brush, our horses now added to our troubles by proving refractory. After having marched southwards many miles in the valley of the Cross we camped at length by the river. The weather cleared in the night, and, in the morning, the sun shone from an azure sky. We were on the march at an early hour, confident that this day would mark the end of our journey with the pack horses. It remained to identify the spot where Barrett, Peyto and I had descended the ridge in 1895 in our circuit of the mountain. Casting about in my memory for some feature to identify the locality, I recalled a certain curious clay bank on the east side of the river, where the clay itself is made up of innumerable layers, each as thin as a sheet of paper, evidently the slow-settling deposits of mud in some glacial lake, now long since filled up. As we were marching along, ever alert for this, I suddenly became aware of various features of the landscape, a broken tree, a clump of bushes, a distant peak, as in a dream, slowly harmonizing themselves to fit the picture carried in the mind's eye through the years. Then, as the impression grew stronger, we rounded a sharp corner of the river and came in full view of the well-remembered clay-bank, now realizing that one part of our campaign was ended. The afternoon was spent in preparation for the morrow, our blankets and rain soaked clothing were spread out in the warm sunshine, the climbing rope was measured and overhauled, while Tom Lusk boiled up a quantity of salt pork and made a number of bannocks for our side trip.

We were now almost south of Assiniboine, but the great peak could not be seen, as an intervening ridge cut off all possibility of a view. Our camp was in the long, straight valley of the Cross River, here flowing south-easterly, to enter the western slopes of the White Man's Pass, not many miles distant. The height and nature of the ridge between us and Assiniboine was almost the same as Sulphur Mountain at Banff, though perhaps not so steep and densely wooded, and this we had to cross, with all our instruments of war and materials for a bivouac, which latter we intended to locate at the very base of Assiniboine. Jim Wood volunteered to help us pack our things to the top of the ridge, but in spite of this assistance, our packs were very heavy. However, in a little more than three hours we had ascended 3,050 feet and stood on the top of the ridge, where we looked with eager and anxious eyes upon the south slopes of Assiniboine, rising in steep cliffs a full 6,000 ft. out of the valley below us. Long study of photographs had impressed a very different image upon our minds than what lay before our eyes. Assiniboine, in a new coat of snow, looked far steeper and more inaccessible than what we had hoped for. We consoled ourselves with the knowledge that all mountain slopes, looked at directly from a distance, appear far steeper than they are. Wood now left us, and with increased weight of packs, we descended to the valley and found a place to sleep near the strange leaf-shaped lake that had so impressed us in 1895. Its waters are deep, and covered still with innumerable floating logs and ancient hulks of trees, the burden of some former snow-slide. From here, the mountain looked far more accessible, and Edouard spent much time working out possible routes for the next clay. Little did we realize the countless difficulties, unseen from out point of view. Rolling up in our blankets at an early hour, we took such sleep as discomfort and the excitement of our projected endeavor allowed.

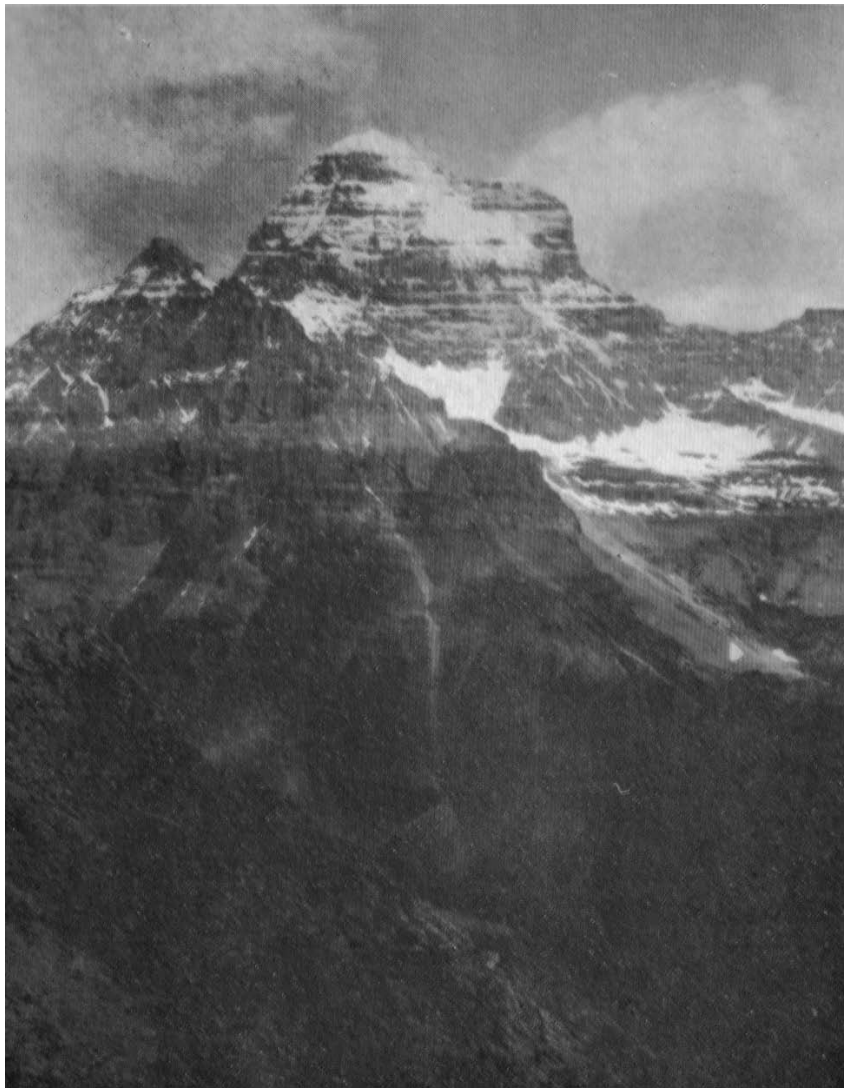
The next morning, July 30th, dawned clear and promising. With 6,000 feet of a difficult mountain before us, Edouard awakened us at an early hour, and at five o'clock we started on what



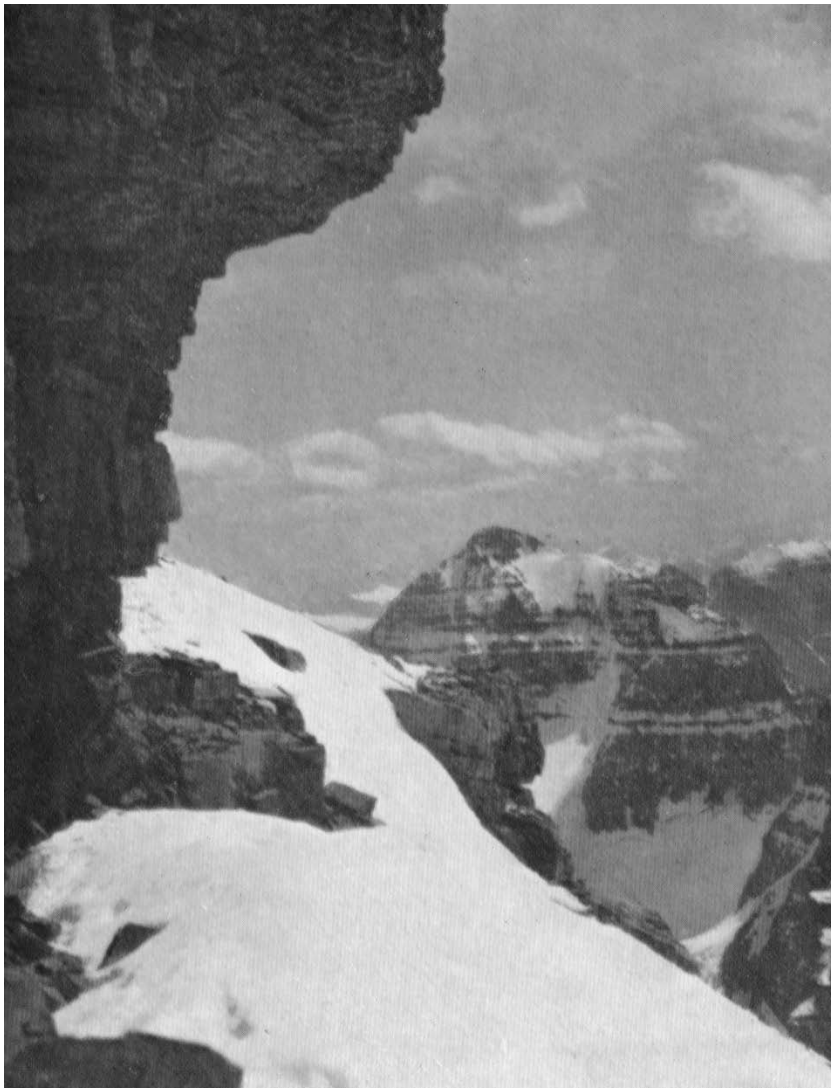
Mt. Assiniboine From North-East. Photograped At Altitude 9000 Feet. W.D. Wilcox, Photo.



Mt. Assiniboine From East-North-East Photographed At Altitude 6000 Feet. W.D. Wilcox, Photo.



Mt. Assiniboine From The South-West Photographed At Altitude 7750 Feet. W.D. Wilcox, Photo.



Looking South-East From South Slope Of Mt. Assiniboine. Altitude About 11,000 Feet. W.D. Wilcox, Photo.

necessarily had to be at the same time our first and final attempt. The temperature was 50 degrees, too warm for the best condition of snow, but, on the other hand, there was no probability of storm. We struck up through the brush and grassy slopes, making excellent time, so that at the end of the first hour our aneroid read 7,325 feet, or a good 1,300 feet above our camp. The second hour, over broken stones and slides, becoming steeper as they led up to the lowermost cliffs, saw us 1,100 feet higher at 8,425 feet. Putting on the rope, Edouard leading, with Bryant next and myself last, we struck up to a line of cliffs, and now for the next two and one-half hours my note-book shows no record of our progress. In fact, the constant succession of cliffs, couloirs and snow slopes demanded our uninterrupted attention. Some mountains, though difficult, permit of a high average speed being made, but we found our progress on this slope, where each of us had to move one at a time, treading with care in precarious footholds, ever watching the rope lest it dislodge stones on those below, most exasperatingly slow, so that we only gained 1,125 feet in those two and one-half hours. Here, at 9,550 feet, we unroped for a light luncheon and rest.

Once more taking up our work, we attacked a succession of couloirs, some filled with ice, and as each was overcome, another more difficult had to be confronted. The rope was necessary at every point, and our advance had to be made with exceeding care. In one couloir, after an interval of climbing, Feuz disappeared above us and, as at length the rope was all paid out, Bryant started to climb, but just at this moment Edouard shouted out: "Be careful, I am in a very bad place here." It seems he had reached the top of the rocks, and above them was a steep shelf, covered with ice and overlaid with a mass of loose stones, ready to fall at the slightest touch. As the great slabs of stone came rattling down the couloir with metallic, almost bell-like sound, we hugged close to the rocks, but even so we were both struck several times by dangerously heavy stones. There was one consolation in our situation, for we realized that every stone that fell made one less above us, and, provided we could hold out long enough, there was an improving chance of our getting up this bad place. As the rope was now all paid out, Bryant and I had to advance directly in to the track of falling stones, while Feuz, with cat-like tread and careful balance, and with absolutely no hand holds, merely precarious resting places for his hands on the loose stones, which he feared to dislodge upon us, crept higher, and at length reached a fairly clear place. Then, assisted by the rope, we came up one at a time. As last man I had the full benefit of this trying situation, but the last man has one great advantage, that he may dislodge as many stones as he likes, without worrying about the consequences.

Meanwhile, the sun, shining out of a clear sky, was doing tremendous work on the snow slopes above us. The roar of avalanches became more and more frequent, and the long, serpentine streams could be seen, from time to time, pouring down the amphitheatre on our left. Echoed and re-echoed amongst the cliffs, the sound of these snow slides appeared to come from every point of the compass. While we were not in the lowest part of the shallow, cirque-like depression, which appears to the south side of the mountain, we were, on the other hand, not on an arête, and so it was quite possible that a great avalanche could sweep over the part of the mountain where we now were. Thus every distant booming roar was startling, and most trying to the nerves, and from time to time Feuz stopped to listen in an endeavor to detect danger at the earliest possible moment. The worst of our situation was that no improvement could be hoped for. The sun was momentarily becoming more powerful, all the rocks and cliffs were dripping, and we sank knee-deep in the soft snow, which scaled off and started miniature slides below us. We all realized at the time, what Feuz admitted later, that the mountain was in a very dangerous condition. Owing, however, to the great efforts expended to get to the mountain, this being the eighth day of our efforts to reach it, we

were taking unusual risks. Shortly after this we came to a more difficult problem than any we had encountered hitherto, in the form of an excessively steep ice-slope, covered with new snow. Here, for the first time, the possibility of defeat arose in our minds, though but two hours previous we had been reasonably confident of success. A slight slip on the part of any one here, even a careless bit of work on the treacherous snow, would have been a serious matter. However, we got through it in safety. Reading over the accounts of various ascents, it seems remarkable how many times this most dangerous of all mountain climbing conditions is successfully encountered. Memory of these chances, however, has slight calming effect on the nerves, while the work is actually going on.

At about half-past twelve we came to the foot of a vertical wall which, in many places, was actually overhanging. Unroping for a moment while Bryant and I took photographs of the marvellous view, Edouard made a reconnaissance along the shelf to the right in search of some couloir, but there was none. We were nearly at the top of the great rock buttress which is such a striking feature of Mt. Assiniboine's southern arête. A short distance south from where we were, this cliff swings around to the north and drops away into the almost vertical cliffs of the east face. There being no possible way of ascent on that side, we now explored along the shelf in the opposite direction. Not far to the left we found a snow couloir, excessively steep, and this we began to ascend, Edouard cutting steps with care. Our progress was very slow, too slow in fact to give us any assurance of final success, and here, accordingly, we had a discussion as to whether we should continue or not. It was now after one o'clock, and we had been more than eight hours reaching our present altitude, which was about 11,000 feet. The slopes of Assiniboine are so steep in this part that we could see only a short distance ahead, but we knew that there were nearly a thousand feet more to be climbed, which Edouard calculated would require another three hours to accomplish. If we continued on and reached the summit, provided we could do so with the snow it its present condition, we could, at the very best, no more than get back before dark to the shelf where we now were, there to spend the night exposed to intense cold, at 11,000 feet above sea level, with the not remote possibility of having our water-soaked feet frozen. Our excessively slow progress up the snow couloir was the last straw that made us decide, though not without regret, to beat a retreat. Thus the south side of Assiniboine had been tried in vain. With the snow in good condition and a little more detailed knowledge of the mountain, we might have climbed Assiniboine from our bivouac at 6,000 feet, but the element of time is the chief obstacle to success by this route, as the last 3,500 or 4,000 feet is a constant climb where the entire party can rarely or never move forward together.

We had, even in defeat, a certain consolation. The climb itself had been most interesting, and from our highest point there was unfolded a splendid panorama: the white line of the Selkirks visible for a hundred miles of their northward course, and to the south an inspiring view over a little known and hardly explored part of the Rockies. Moreover, we had carried the record to another higher level on the mountain, making the last attempt before Mr. Outram's successful ascent exactly five weeks later. What, therefore, seemed at first the least practical method of attack, from the north, eventually proved the correct solution, for it has three great advantages, a level 1500 feet higher to start from, the possibility of using the main camp as a base, and a larger proportion of snow slopes, where rapid climbing can be done. At the time of our ascent we were not aware that the north-western slopes of the mountain could be skirted.

When we started to climb the steep snow couloir leading through the cliff at 11,000 feet, Feuz left his card under a pile of rocks at the base of this cliff as a record in case we did not get back. Mr. Bryant, also, says that he feels confident that if we had continued on that day that the

probabilities were very greatly against our successful return to civilization.

In our descent we found it impossible to cross certain snow slopes that we had ascended, as they were facing the western sun, and we had a most uncomfortable hour on the steep ice-slope. A final variation of route allowed us to make a long glissade of nearly two thousand feet, saving tiresome work in the lower couloirs. We reached our bivouac at seven-thirty, after having been out fourteen and one-half hours.

The Second Ascent Of Mt. Tupper.

By Jean Parker.

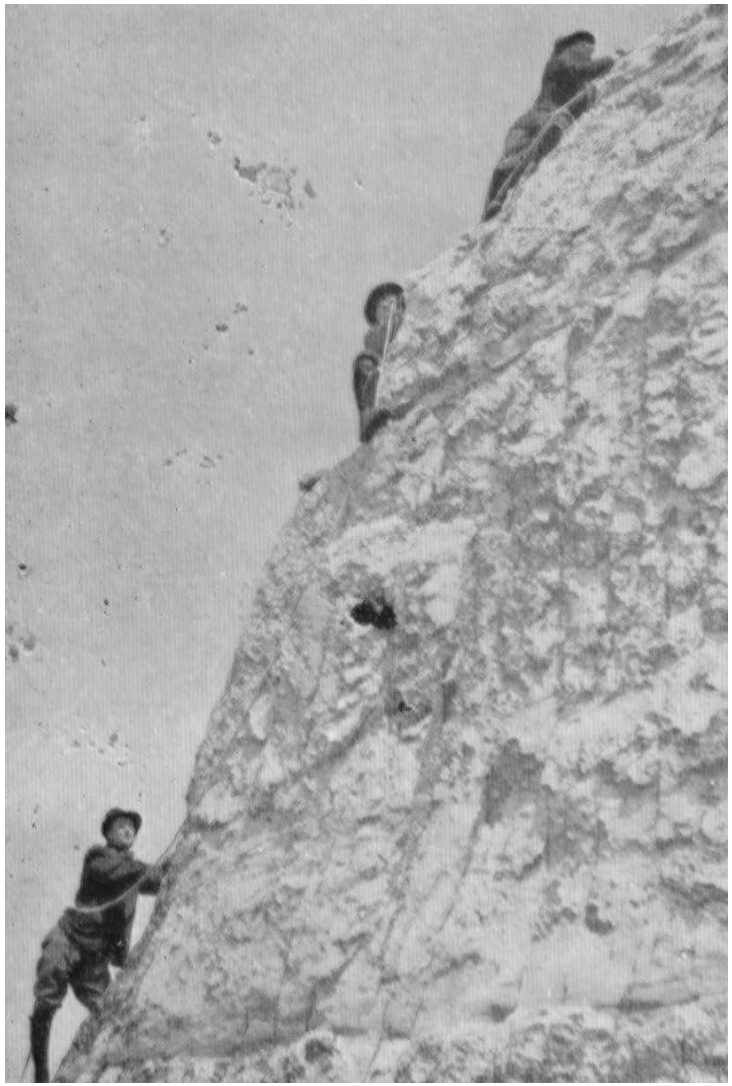
Mt. Tupper is at the south-east extremity of the Hermit range, a sub-range of the Selkirks. It was first called Mt. Hermit from the fact that on the ridge leading to it stands a pinnacle which suggests a statue of a hermit. Recently, however, the name "Hermit" has been appropriated to another peak in the range. From all points of view, Mt. Tupper appears an easy and short climb. Short it is, for it is but 9,222 feet high. But several attempts had been made upon it before it was conquered in 1906 by a German named Koehler, with Edouard Feuz, Jr., and Gottfried Feuz as guides.

It was with a sense of great disappointment that I left the Alpine camp at Rogers Pass to make my way along the railway track to Glacier House. All chance of an attempt on Mt. Tupper seemed to have slipped away. Going along the track I met Mr. Henry H. Worsfold, of England, who, I found, was equally disappointed. Some way, I am not sure how, but in a few minutes we had arranged to make the attempt together at the end of the week if the weather were favorable and we could secure the guides. Edouard Feuz, Sr., was with Mr. Worsfold. He was engaged on the spot, and I hurried on to Glacier House to secure Edouard Feuz, Jr., who, I was relieved to find, was free for Saturday and Sunday.

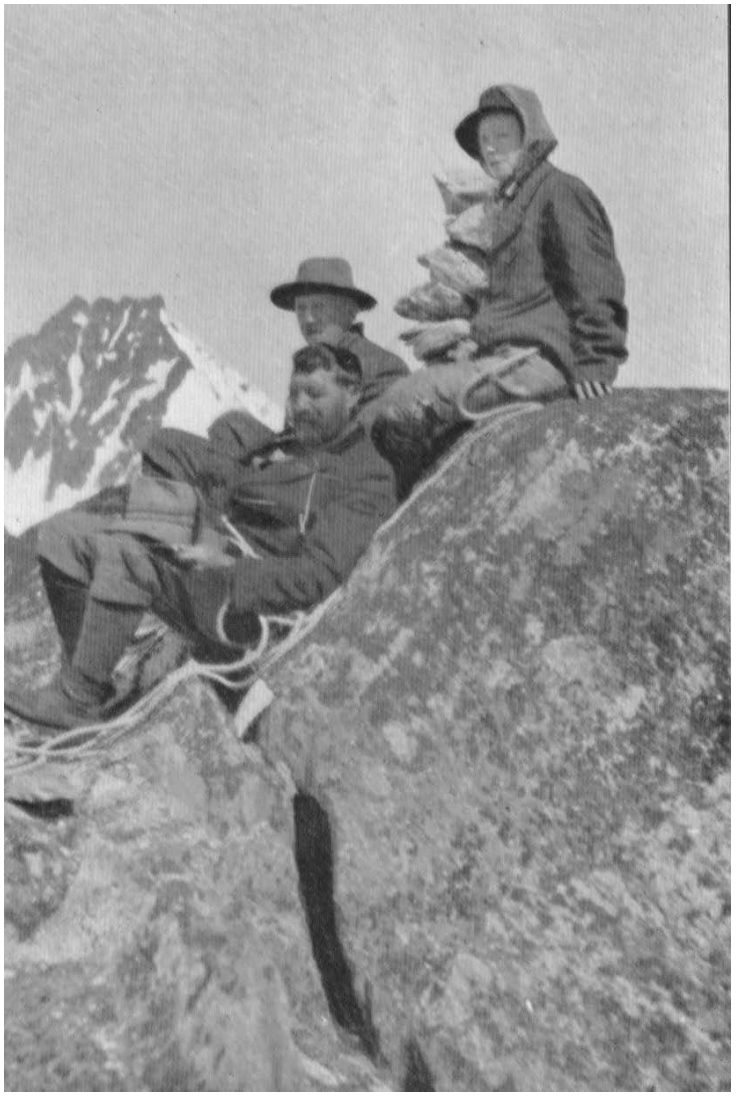
The days of waiting were spent in watching the weather. Frequent trips were made down the track to look at Mt. Cheops, the weather-man of the Selkirks. I was almost afraid to leave the hotel for fear of disturbing that most important factor, the weather.

At last Saturday afternoon came, and, by a quarter after three o'clock we were off for the Hermit Hut, where we were to spend the night before making the climb next day. It was hot and we took our time. Turning eastward we walked the five miles of railway ties, choosing the cool snowsheds when possible, until we reached the trail leading up to the Hermit Hut. This hut, which is perched about 2,300 feet above Rogers Pass, was built by the Canadian Pacific Railway for the convenience of climbers. Nothing is too bad to say about that trail. It is very steep, very stony, and, on this occasion, very wet and slippery and altogether stupid. I found it necessary to stop often, and my stalwart companion felt anxious, as he afterwards confessed, about my staying powers for the real climb. However, we reached the hut at six o'clock. Once arrived, it is a favorable place for a bivouac, for the view is well worth a longer and more tedious climb.

The two guides had preceded us, and in a short time the evening meal was over and we were sitting around the camp fire watching the weather again, and incidentally drying our feet. At nine o'clock our spirits went down to zero, for the rain came down in torrents. In a short time, however, it cleared up, leaving the sky bright and clear. In a contented frame of mind we took off our boots and slipped into the bunks for a few hours' rest. I had some difficulty in curling myself up to be free of the pools of water, for our tin-roofed hut leaked. At half-past twelve we were awakened by a prolonged downpour, and this time I felt we were doomed for certain, for even if it did clear up



Climbing Mt. Tupper. Ed. Feuz, Jr., Photo.



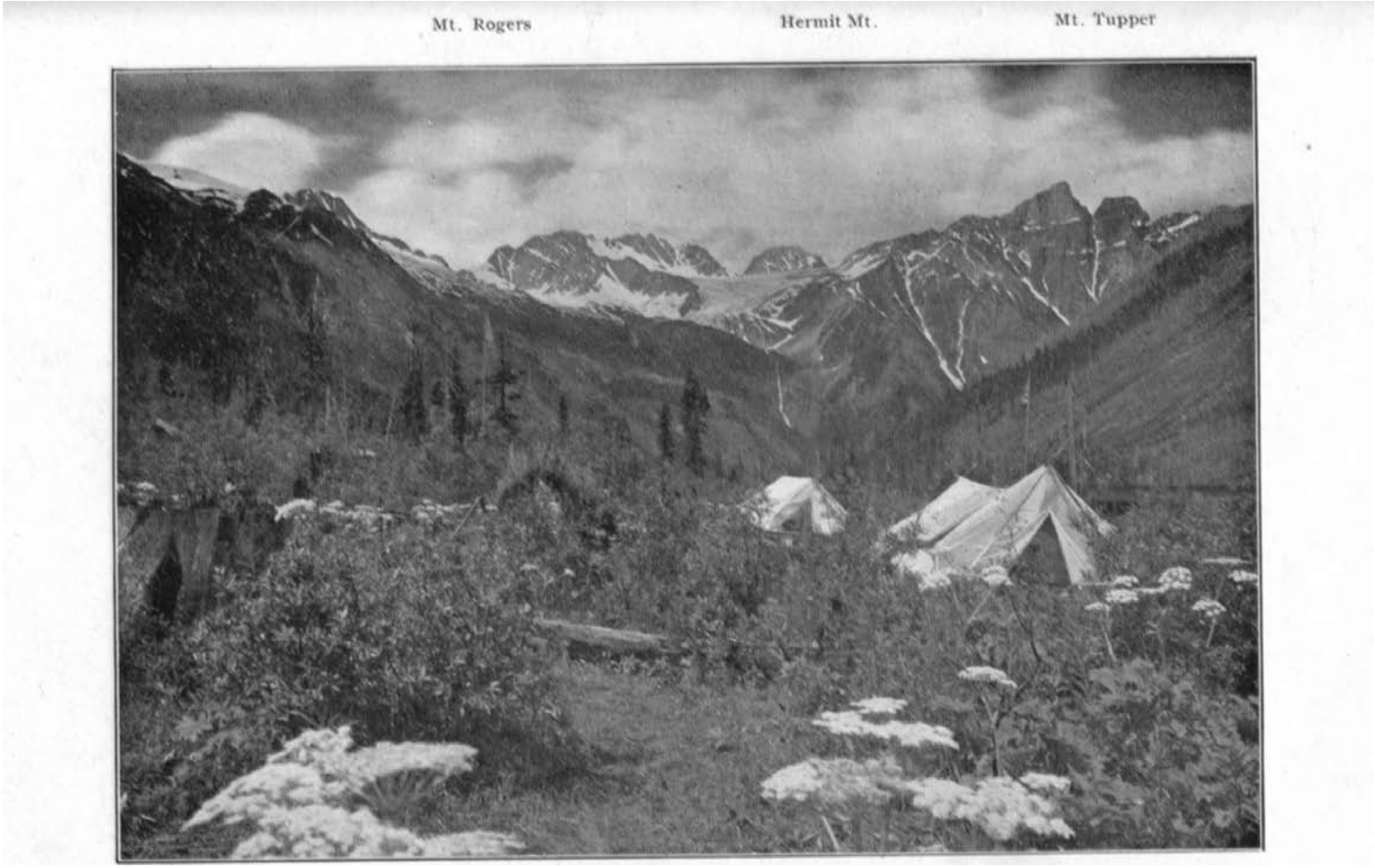
On The Summit. Ed. Feuz, Jr., Photo.

there was a probability of the rocks being covered by a thin coat of ice. It was not a bit of use to sit up and grumble, so I curled myself up again, this time with greater difficulty, and went to sleep. But not very soundly, for I remember distinctly the flicker of a candle and some movement in the hut, which turned out to be Edouard Jr. chasing a mountain rat. I was finally awakened by still more movement, which proved to be the same Edouard getting breakfast. When asked the time, he said "half-past seven." Then I was quite sure the climb was off. However, this was one of the guides' jokes, and it was only a quarter past four. Breakfast was soon over, the blankets hung on a rope out of the reach of our visitor of the night, the door latched and the fire put out, and we were ready to march. It was then ten minutes past five.

The morning was perfect, clear and cool. Just the morning to make you keep moving. Moreover, there was no cloud on Mt. Cheops and we were safe as far as the weather was concerned. We were not a gay party as we moved up that trail directly behind the hut, for I, for one, felt how unpleasant it would be to return to the hotel and face the " I told you so's." Leaving the trail, we turned directly east, crossing a number of little streams, running down through an easy grassy slope. Above us were Mts. Sifton, Rogers, Swiss Peak and Hermit, and in front of us was Mt. Tupper. Still going eastward we crossed the tongue of the Hermit glacier, up a short moraine, over a short snow-slope, and gained the arête leading directly to our goal. It was ten minutes after seven, and this was fairly good time, for the way had been easy and we had not loitered. At this point the rope was put on. The sun had come out and we were grateful. Any ice that may have formed during the night had quickly disappeared.

This arête running southward, is formed by huge, irregular blocks of solid stone, over which we scrambled or squeezed between, with disaster to our coat buttons. By this time a keen wind had sprung up, and I had to borrow Edouard's coat. (It takes a long time to learn how much to carry on an expedition of this kind.) We climbed right over the "Hermit's House," squeezed through a crack in the "Hermit's Dog," and found ourselves on a small plateau. Then the first really serious work began. This was the rounding of the sheer foot of the "Hermit" himself. This pinnacle, called "The Hermit," occupies the whole of the narrow neck that separates the long arête from the Tupper peak. There is no getting out of it. You cannot climb over, for it is too sharp, so you must go around it. There were few footholds and there was a great drop beneath us, but by doing exactly as we were told, and with the help of the wind which blew us tightly against the rock, we passed safely. We dropped from the foot of the Hermit into a rock couloir. It was nine o'clock and quite time for a second breakfast, which was quickly dispatched. It was too cold to loiter. The guides thought it was wiser to cache the ice-axes and rucksacks here than to drag them along with us.

From the couloir we had a good view of the climb before us. Immense blocks of rock rose up piled upon each other, leaving very scanty footholds, and, in some places, long faces without a single jutting rock. To leave the couloir and gain the ridge above we had to ascend a chimney twelve or fourteen feet high, in which rock "bouquets " fell continually. I found myself wishing for the limbs of that tall man who had climbed that chimney before. However, with the help of Edouard Senior's broad shoulder and a hand from above, I managed to get up. We recognized the wisdom of the guides in leaving the axes behind, for, with them, we should have been greatly hindered. Another small and very rotten chimney barred our way to the next ridge. It was soon passed, and from there we crawled up a long, plain, perpendicular face of rock to an overhanging shelf, along which we crawled to the main corner on the east. Our surprise was great when a short climb brought us suddenly to a small rectangular plateau, upon which was a long rock mound about three feet high, and upon that two or three stones of a stoneman. It took several seconds to



Mt. Tupper From Rogers Pass. A.O. Wheeler, Photo.

realize that we were actually upon the summit of the long-coveted Mt. Tupper. It was ten minutes after ten, making exactly five hours from the Hermit Hut.

We were hungry, but alas, everything was left behind in the couloir. My companion found a small cake of chocolate in his pocket. We devoured this, and, for the rest, feasted ourselves upon what we could see. Leagues of peaks and glaciers were upon all sides of us. I could myself recognize Mts. Victoria, Hungabee, Biddle, Stephen, Sir Donald and the two great glaciers. The guides pointed out numerous others—Mt. Goodsir, the Dawson range, Mt. Forbes, the Columbia snow-field, quite too many to name.

After the guides had made a new stone-man, we left the top. It was exactly ten minutes after eleven. We worked our way down, slowly and cautiously, as we had gone up, stopping in the couloir long enough to have a third breakfast and gather up our traps. Then we hurried along, around the "Hermit" and over the same huge blocks of rock and through the same cracks until we gained the end of the arête where we unroped. The rest of the descent was quickly made and the hut was reached at ten minutes after four. The round ascent occupied exactly ten hours.

Every step of the way had been full of interest, our guides had been capable and thoughtful, and we were well satisfied with the day. We had supper at the hut and by ten minutes to seven were at Glacier House dressing for dinner.

If I were asked what part of the whole climb was most tiring, I would not hesitate to say, that stupid trail from Rogers Pass to the Hermit Hut. Of the difficulties there is very little to tell. From the time we left the couloir until we reached the summit it was all hard climbing, requiring attention and obedience, but with two such good guides we could not fail.

EDITORIAL NOTE.

In conjunction with the foregoing account of the first ascent of Mount Tupper by a lady, an account of the first ascent, made by Wolfgang Koehler, of Leipzig, in 1906, taken from the Minute Book at Glacier House, will be of interest as a matter of record.

Ascent Of Mount Tupper

By Wolfgang Koehler.
(Translated from the German.)

July, 1906.

After I had spent four days with Edouard Feuz, Jr., in the Yoho Valley, and he had there told me of Mt. Tupper, of which no ascent had yet been made, I determined to make the attempt.

I had still two days, so we telegraphed on June I7th to the Glacier for blankets and stores to be provided for us at the Hermit Range hut. The next day, by previous arrangement, Edouard woke me at 8 o'clock. Alas! the weather was bad. We telegraphed down, made it a day of rest, and went the next morning up Mount Stephen, where Gottfried accompanied us.

On that day I went with the two of them to Rogers Pass, where Edouard showed me Mount Tupper. I was astonished at the beautiful wild form of the mountain, sad over the frustration of my purpose, and mad at the Fates who had left me so short a time here.

At Glacier we met the old Herr Feuz, and while I was at supper the thought flew through my head, "Perhaps you could go back again." I went up to where the three stood, told them of my idea, and communicated to them that I had sent everything home, pick, boots, dress, etc. " Pick and hat I can lend you," said Edouard, " and since you can get fresh clothes and boots in Vancouver, you have everything necessary."

So we nailed the shoes with nails which we had brought from Switzerland, and with light hearts away and off to Alaska.

I started back on Sunday, July 1st, but had to wait on account of it being Dominion Day; then I quickly bought the necessaries and journeyed back to Glacier, where I was welcomed by the three Feuz. I quickly lunched and changed my clothes. Alas! the breeches were not a very good fit. However, Edouard lent me a pair, and soon (5.10 p.m.) we joyfully wandered forth along the track, Gottfried, Edouard and I.

It was a magnificent, cloudless day, which I found particularly enjoyable after the weeks of rain I had experienced. Soon after Rogers Pass (6.15 p.m.) we left the track and continued our way, pretty well warmed up on account of our heavy packs, along the narrow path to the hut high above, which we reached before 8 o'clock

(7.55 p.m.)-

Mr. Flindt had had the kindness to lend me his field-glasses, and often we stood still in wonderment at the mighty walls of rock of the mountain, and we talked of the possibility of getting to the two summits, through the mighty collection of peaks crowded together. Gottfried made some fine cocoa, Edouard did the rest, and I sat before the hut and played the mouth-organ. The mosquitoes stung us nearly to desperation. After supper, and a hunt after a big rat, we went, at ten o'clock, to bed. We could, however, sleep but very little, on account of the mosquitoes, which persecuted us terribly.

The night was wonderfully beautiful, a cloudless sky and brilliant moonlight. Moreover, to be surrounded by the dear, beautiful mountains! How one's heart goes out to them! Towards 4 a.m. we got up, breakfasted, and started off (5 a.m.). We took the direction at first immediately behind the hut, then turned off to the right, and across the little icy creek, looking up to the Rogers, Swiss and Fleming's Peaks, Mount Tupper, Sifton and Grizzly. It was always up and then down again. We had innumerable gullies and streams to cross, until we reached the ridge, at the end of two hours. We rested a little and then started on again, always following the ridge, over icy blocks.

At 7.30 we stood on the Steinmann, which Messrs. Wheeler and Herdman reached on their expedition along the ridge towards Mount Tupper. From below, it looked as if everything was very bad stone, but this was not really the case; for the most part it is good, rough stone. Soon we saw the great, beautiful gendarme before us, directly in front of the little one. On a smooth inclined plain we slid downwards for a bit, and then stood on a piece of a very sharp ridge.

Edouard thought it was not possible to go to the little gendarme, but we climbed in a dry furrow on the plateau and crossed it; then climbed along the plateau to a beautiful canyon, high up, and so came to the little gendarme with difficulty. We continued to the right on easy ground, and climbed into a corner, high up the steep precipice to the next plateau. There the hold was very slight, notwithstanding great cautiousness. The narrow but solid flat brought us now to the left (about 9 a.m.) directly behind the great gendarme, where we rested and lunched.

We took a good look round to see where we were. Behind the gendarme the ridge made a perpendicular rise, perfectly smooth and without hold. Here two rectangular rocky walls were formed. On this ridge, on the side towards Mount Hermit, was an enormous rock, and in the chasm made by this wall we were able to scramble on upwards. On the side towards Mount Macdonald runs the wall fifteen to twenty minutes, without hold of any sort, to a beautiful corner, then fifteen minutes further on to the right, to run back again in the old direction. In the corner a crevasse runs upwards and seemed a further possibility.

The one which to me seemed the best was the following: In the middle of the right wall

was a broad chimney, if only we could get up there direct. Two ridges appeared running parallel, which seemed to make the ascent possible. We climbed to the first ridge, next to the chimney, then up the first ridge in the chimney itself. So far we were still right. With the help of three picks and four hands Edouard got up a little higher, but quickly came down again. That could not be the right way. He tried then to go direct by the chimney, but that was not practicable, and so he had to come back.

In between was Gottfried, who had successfully climbed up and stood in the chimney. I followed, Gottfried continued on, but a shower of big and small stones came down. It seemed as if everything was rotten, and, in spite of great care, not one of us could avoid bringing down the stones. We now went on the outside, round the rock, and came to a big flat, climbed a little broken chimney and then got over a large rock. Soon we stood again before the wall. One piece appeared somewhat loose, and formed a breach, which gave us sufficient hold to get on to a small platform. From there it was a short, somewhat overhanging climb to the higher platform. "This is the sort of place for people with long legs," Edouard called out (I am, to wit, 6ft. 4in.). "Alas, we little ones have no chance."

We now came back again to the ridge, came to a little gendarme with a beautiful outlook down the valley, and climbed on, until we suddenly came to a wide platform, from which there is no "bicycle path "to the Aiguille du Grepon. We had all three expected that the last piece to the summit would be especially difficult. It looked so from the distance, but when we came to it, quite an easy way appeared of getting up. We stepped over one sharp knife-edged ridge, "tight-rope dancing" we called it, and with a loud hurrah reached the summit.

"This is really the top," said Edouard. And so we got on to the beautiful broad summit. We had all thought that the last piece would be the hardest. With loud yells we took possession of Mount Tupper. During the whole way we had the most beautiful views. Although there were some light clouds in the sky, Mt. Stephen and Mt. Purity stood out clear and beautiful among the nearest mountains, and the numberless other peaks and glaciers were beautiful beyond words. Soon we thought about crossing to the little peak over the zig-zag ridge. I gave them three suggestions, one—the most important —the guide was a little doubtful about, because the weather looked likely to be bad, and we had left the whole of our packs in the hut.

If ever again I come to Mount Tupper I would start earlier and certainly try and make the crossing. We took a meal and enjoyed the view and built a stoneman. But the highest peak was not very secure footing, and we thought we should have been blown away by the wind.

We built, in three-quarters of an hour, a big stoneman, bigger than I am, on the side which could be seen from the railway by the naked eye.

Getting the necessary stones to make it was the hardest task in the day. We then laid information in our sugar box, the contents of which disappeared in Gottfried's pocket, ate snow mixed with peaches, which we split with our picks, and I played the mouth-organ, " Ich hätt einen Kamaraden," which put us in a good humor. We tried with Gottfried's pocket glass to make a reflection, but failed; the sun was not right. After we had taken some pictures of the summit, we said goodbye to our stoneman and began the descent in very good humor. The two gendarmes I called "Edouard" and "Gottfried," whereupon they, in revenge, called the rotten chimney, "Kohler Chimney." Everywhere in this place it is bad and dangerous, the rocks looking ready to fall. We got on as quickly as possible and were glad to get over it. We made good progress. Soon we left the ridge behind and slid on the snow, and then a nice glissade down into the valley. Cooled off by a cascade which we had to go through, and greeted by marmots and our house-rat, we came at last

to the hut. We had arranged not to spend the night there, on account of the mosquitoes, but in an hour to continue the descent. After a nice cocoa from Gottfried's master hand, and having changed shoes and socks, we got quickly down to the valley by 6 o'clock, and at 6.25 reached the railway. We washed and walked back by the track. "If we only go the right way," said Gottfried. Edouard and I had the pleasure of getting covered with coal dust from the locomotive.

At the final curve before Glacier House I said a last farewell to my mountain, "I hope to see you again." And so we came back, rich in experience and in the best form, arriving at Glacier House about 8.15.

And the moral — Mount Tupper is not a neck-breaker, it is full of interest, but there is nothing but what a good climber should accomplish.

Caution where the ground is very bad.

Would that many could see and experience the joy of this beautiful mountain as I have done. To my dear guides I give my best thanks, and wish them the best of things for the future, though I well know that two such capable young guides will always be in requisition.

"Aufwiedersehen, Glacier House."

Beyond The Asulkan.

By W. D. Holway.

For several years F. K. Butters and the writer, of Minneapolis, Minn., had camped and climbed in the Canadian Rockies, but previous to 1908 had given but little attention to the Selkirks. A flying trip to Fish Creek Valley in 1906 had shown us that the region was the most attractive one within reach, and we arrived at Glacier in July, 1908, prepared to put in all our time there. The great length of some of the snow bridges observed during our first trip made it seem desirable to obtain a third man. We therefore visited the Alpine Club Camp and fortunately persuaded Howard Palmer, of Boston, to join us. We had two pack-sacks of ample size; one pack-cloth, 5x6 ft., with a pack harness; one 5x8 ft. silk "A" tent with round ends, a form which permits great variation in floor space, is absolutely waterproof, and weighs only 5 lbs.; two Johnson sleeping bags with four thicknesses of light blankets, which were unlaced and made into a bag large enough for three persons, (weight 20 lb.) ; aluminum dishes, cameras, plant press, camp axe, alpine rope, 3 ice axes, sweaters, etc.

For provisions we carried the German erbswurst, flour, sugar (as much as of flour), bacon, beans thoroughly cooked at home and dried, a little corn meal, prunes, sweet chocolate, and tea. All the food was packed in water-proof 10 lb. sacks.

Leaving the Glacier House at nine in the morning, we walked up the Asulkan Valley, along the moraine, and across the glacier to the summit of the Asulkan Pass. Although this was all up hill, 3700 feet above the hotel, it was far easier than the steep descent of 3000 feet to the Geikie Glacier. The last one thousand feet of this descent especially required great care with our heavy packs.

From the pass we kept to the left following the stream until we reached the falls, when we crossed it and continued down until we could get on to the snow that filled the lower part of the gully. The Geikie Glacier is about a quarter of a mile wide where we reached it and as the crevasses were all open it was soon crossed. By this time we were perfectly willing to camp, and climbing the sliding stones we descended into the corner formed by the moraines of the Geikie and Dawson Glaciers, where we were perfectly protected from the cold winds and fuel and water were abundant. Later in the season we found our spring dry and were obliged to bring water from the

stream above. Soup, flapjacks, bacon and tea soon made us feel glad that we were alive.

In the morning we ascended Mt. Fox by following the Dawson Moraine to where it turns sharply to the left, then straight up and over the cliffs; thence to the left over loose stone to the snowfield which was crossed to the rocks and the summit was easily attained. The drop into the Beaver Valley was very impressive, and the view, as from all the peaks in this section, magnificent.

A day was spent in following the Geikie Glacier to the upper ice-fall, a trip which we advise all to make, as it is over the finest glacier in all the region. While drinking from a stream on this glacier we were surprised to see the ice crack for a long distance each way and our water disappear far beneath us.

Our next expedition was across the Dawson and Donkin Glaciers to Donkin Pass. The crevasses were easily avoided, but a large bergschrund was encountered at the final rocks. A way into it was made but the opposing wall of snow was 12 feet high and absolutely perpendicular. A remark by one of the party that it looked easy started us at it and by using all the ice axes for steps one of us surmounted it and let down the rope. Then it was over steep ice slopes to the left-hand end of the big overhanging cornice and over that to the summit. Here we saw three mountain goat feeding. The weather had been promising to give us a storm and we were soon being pounded by hailstones that sent us to the shelter of the rocks. As there was no prospect of being able to do more that day we looked for an easier route down, and going to the east avoided most of the ice, reaching the bergschrund where two heavy sheets of ice projected just right for our use. We cut steps in the lower one and hand holes in the upper, and making our way carefully along with occasional glances into the blue caverns beneath us, reached the base of a huge snow-ball which had fallen from above. Up this we cut steps and from the top of it we jumped to the glacier below and hurried to camp in a pouring rain.

The next morning was fine so we looked for a new way to ascend Mt. Donkin, as having already made Donkin Pass we did not care for that route. We therefore went up the Dawson Moraine, turned to the right and crossed the Dawson Glacier at the first opportunity: thence directly to the summit of the ridge some distance north of the survey station "Donkin North." The ridge reminds one of the Abbott, but is so narrow in one place that we straddled it and worked ourselves along. As soon as we could we descended to the glacier on the west, crossed it to the south and made the ascent over the big stones of the western slope. The view in every direction is glorious. It may be noted that the photograph in Mr. Wheeler's Selkirk Range, p. 96, is from here and not from Donkin Pass, as labeled, and that there are many other directions in which the scenery is equally grand. The climb offers no difficulties and is alone worth the trip to Fish Creek. Our provisions were now getting low and before going for more it was voted to get up early for once and climb Mt. Dawson. The day began with mists over all the high peaks. No trouble was experienced in reaching the amphitheatre and, as the bergschrund was in good condition, we attacked the wall at the easiest point. At first it was over wet and sliding shale, then over loose stone to the summit. From here we followed the arête, finding a small camp axe, no doubt lost by the Austrian climber,[1] whose record-breaking time table is given in the Glacier House book. We had a little step-cutting in ice and some of the snow-bridges were longer than was entirely pleasant, but we safely reached the rounded pile of shale between Selwyn and Dawson, where we lunched and waited in vain for the clouds on the latter to disappear. The sun was shining on Selwyn so it was decided that a view

1 Edward Franzelin, Bruneck, Tyrol, Austria.

was better than getting 100 ft. higher without one. We therefore crept along the wall of rock and across the big cornice until the broken slabs of Selwyn were reached. Here one of us went directly to the summit and the others went down some distance by the side of the first couloir to ascertain if a descent to the Deville Glacier was possible. The gully was then crossed and the summit reached over the long slope of loose rock and slabs that extends from the glacier to the top. The view was good in every direction, although Mt. Dawson remained in mist. After leaving our records and making photographs we went down to the Deville Glacier. Crossing the large bergschrund and keeping to the right, we followed the Bishops Glacier until we were below Donkin Pass. Here we found our three goats feeding along the moraine. When they saw us they climbed over the rocks of Mt. Dawson in a way that made us envious. We crossed the pass and reached camp by our last route, satisfied that we were not yet "clean gone to flesh pots and effeminacy," for we had in one day, without guides, climbed Mt. Selwyn and walked entirely around Mt. Dawson. This is also a trip that we strongly recommend for its great interest and beauty.

The next day we made our tent snug and returned to the Glacier House for food. Mr. Palmer, still needing exercise, ran up Sir Donald one morning with Edward Feuz, Sr. Mr. Butters and the writer, having made the ascent a few days before, were quite willing to enjoy a little rest. The third day we filled our packs and returned to our tent.

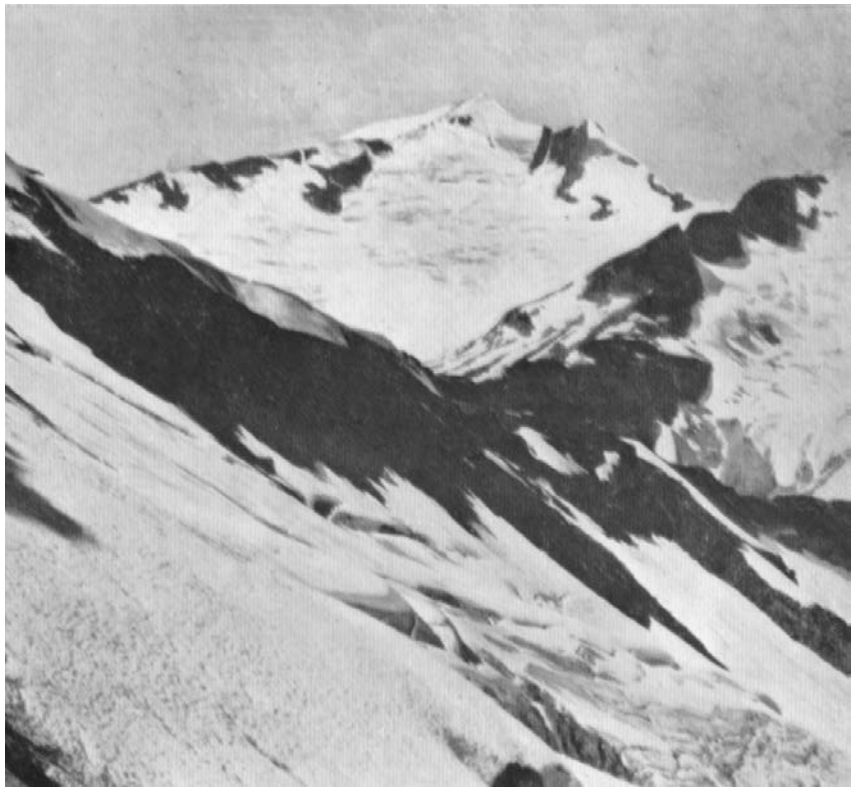
The next morning, as we started to Donkin Pass with all our things, we found our loads to be 50 lb. each. The bergschrund was in better condition, but the 300 feet of slippery, sliding rocks were made an inch at a time and a long rest was taken at the summit.

We then went down to the valley, crossed the snout of the Bishops Glacier and soon came to the Huber, Topham and Foster camp of 1890. There was still a can of corned beef, which we found later to be perfectly good after its eighteen years exposure to Selkirk weather. Their iron frying pan, though rusty, was yet serviceable, and we appropriated it so that two might fry flap-jacks and give us more time for sleep. There was no water here so we went 500 ft. lower and camped in a fine little meadow.

MT. CYPRIAN, FIRST ASCENT.

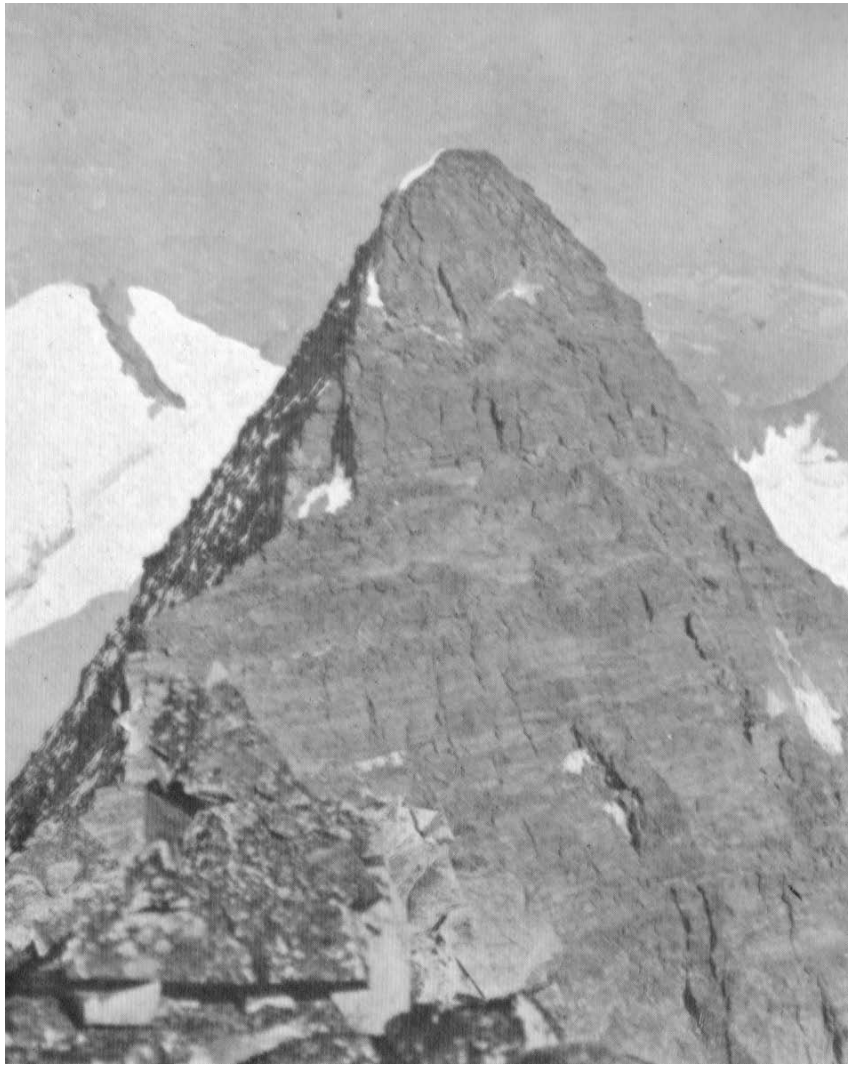
The second day we crossed the Bishops Range, 1500 feet above our camp, descended the Black Glacier and looked for a route up Cyprian. It was soon seen that if we could surmount the first belt of cliffs the mountain was ours. For a long time no way was discovered except to begin the ascent some distance to the west, try to reach the ridge and make a descent into the col. As we were turning towards camp Mr. Palmer luckily saw a ledge leading upwards and after a hasty examination with our glasses, we decided to try it. In the morning we reached a point some 60 ft. below this ledge, which could be attained through a sloping chimney or around and up a smooth gully. Putting on the rope so that there might be some limit to a slip, one of us worked slowly up the gully as far as the rope permitted, and as there was no place to stop a request was made to have an ice axe tied to the end of the rope. This was carefully drawn up, a firm hold obtained with it in the rocks above, and a standing place reached. From here a gully was crossed and a ledge found leading down to the chimney. Then the rope was lowered and the others came up. After clearing the chimney of loose rocks it was found to be a good route, although it was necessary to ascend upon one's back, as the hand holes were all upon the upper side. The ledge seen the day before was now easily reached and an interesting scramble over rather smooth ledges and some loose rocks brought us to the col on the west and thence over big block to the summit.

There was no sign that any one had ever been there, so we built a stone man and left our

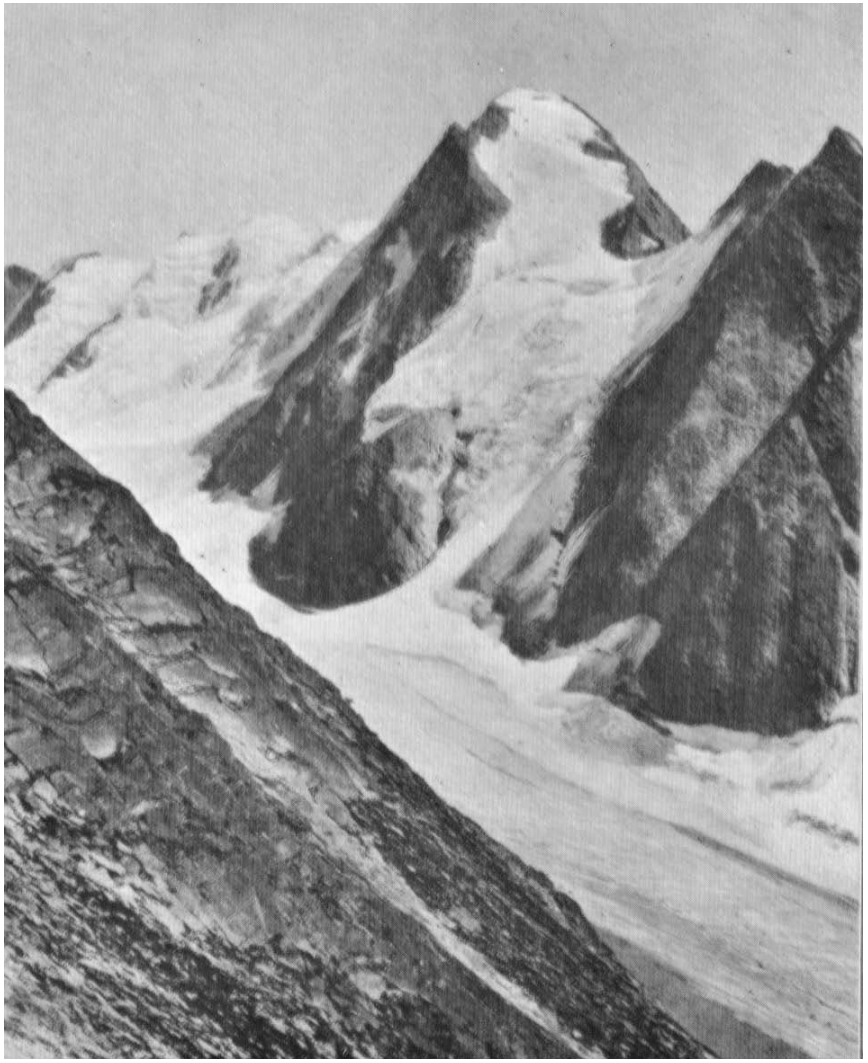


Mt. Bonney From Donkin Pass. E.W.D. Holway, Photo.

Mt. Wheeler From Cyprian Peak. E.W.D. Holway, Photo.



Augustine Peak, Bishops Range. From Cyprian Peak. E.W.D. Holway, Photo.



Cyprian Peak, Bishops Range From Donkin Pass. E.W.D. Holway, Photo.

records. The actual summit is not visible from Donkin Pass, so our mountain is not to be seen from that point. The precipices on the south overhang and stones rolled over did not touch until they struck the slopes above the Black Glacier. Mt. Augustine, 50 ft. higher, was separated from us by a deep chasm and offers a fine climb. Cyprian is more difficult than Selwyn, but when the rocks are dry it can easily be done by anyone who has had a little experience. The ascent can, the writer thinks, be made in two other ways, but our route certainly is the most attractive one. It will be hard to find a finer climb.

MTS. WHEELER AND KILPATRICK.

We went up the Bishops Glacier and over the Deville Névé to the col between Wheeler and Kilpatrick and along the arête to the summit of Wheeler. There is no real climbing by this route, but the view is of the wildest grandeur. The stone man was in bad condition and we built a new one a little to the north. We returned by the same route, and the long tramp over the snow was so tiresome that it was 10 o'clock the next morning before we left the tent. We then went over to the Black Glacier and up the glaciers and snow-fields to the col on the west of Kilpatrick. The crevasses on the slopes are immense and the snow-fall of the different years is plainly shown by the dark dividing lines. The arête of Kilpatrick was not to be easily reached, and as it was late we gave up the ascent. It can be made from the col by going east over the small rock mountain projecting from the ice, or better by keeping well to the left on the way up, thus reaching the arête to the east of the rocks and avoiding the climb over them and the cutting down the ice slopes on their eastern side.

With such constant climbing there was no difficulty in following Abraham's rule No. 20, "Eat and drink as much as possible," and a morning came when there was nothing left after breakfast. So at 9 o'clock we packed up our loads, now reduced to 25 lbs. each, and crossed the two ranges between us and the railway. It was dark as we left the Asulkan Glacier, and 9.30 p.m. when we walked into the Glacier House. Without anything to eat since breakfast, we had, for several hours, been planning a dinner, and we soon captured the chef and waiter and marched into the dining room, just as we were, ordering sirloin steaks, eggs, and all good things. After an hour or so these had disappeared, and the "boys" of the party were willing to tighten their belts and wait for breakfast. The "old man," however, had only replaced the wear and tear incident to crossing the first range of mountains and asked the waiter to duplicate the orders. He soon returned and asked if we were willing to wait a little, as the chef was in bed, but would get up if we said so. He was invited to arise, and we soon began another feast. It is hard to tell which has left the most pleasant memories, this dinner, or the days beyond the Asulkan.

How To Reach Mount Sir Sandford.

By P. A. Carson.

Mount Sir Sandford (elevation 11,634 feet), the highest peak in the Selkirks, is at present the Mecca of many aspiring pilgrims in Canada. This magnificent mountain, whose snow-capped summit rises over a thousand feet above its neighbours, lies some twenty-three miles in a north-westerly direction from Beavermouth railway station, but these twenty-three miles resolve themselves into many more before Sir Sandford can be reached without the use of an aeroplane. The mountain lies between two branches of Gold Creek, which stream flows into Columbia River about twenty miles below Beavermouth. Either of two routes may be taken to reach the base, and it is a debated question which is the better—by canoe down the Columbia and up Gold Creek, or by pack trail up the North Branch of Six Mile Creek.

As canoes are more easily available in this vicinity, it would seem at first that the water route is the more practicable. The mouth of Gold Creek can easily be reached in five or six hours, and that stream can be ascended five or six miles by canoe. Thence it is necessary to shoulder packs and push through the rough valley of Gold Creek. On crossing Novelist Creek, a branch of Gold Creek from the Northwest, it seems advisable to ascend to timber line of Mt. Sandford Junior, which is three miles east of the coveted summit, and in reality is part of the same mountain. Now the disadvantage of the canoe route is evident. The peak of Sir Sandford is several miles away, and the climbers are on the north-easterly slope of the mountain, from which direction I am sure the ascent would be most arduous, if not impossible.

The route via Six Mile Creek can be made either with horses or on foot. Dr. Shaw and Mr. Reuben Shaw, in August, 1908, made a reconnaissance of Mt. Sir Sandford, travelling by this route on foot, with fairly heavy packs. During the latter part of the same month, I made the trip into this district with horses, which had to be shipped to Six Mile Creek by rail, as there is no trail leading to it from either direction. From the siding at Six Mile Creek (elevation 2600 feet), we ascended a long ridge, covered with brulé and windfall, which lies between Beaver River and the North Branch of Six Mile Creek. After a steady pull of nearly three hours we made three miles, and attained an elevation of 6,000 feet, whence the going was comparatively easy through the sparse timber of this high altitude. We advanced north-westerly another three miles to two small alpine lakes forming the head-waters of a stream flowing easterly into the Columbia. Continuing in the same direction, we went through a pass at timber-line, and ascended to "The Esplanade," a long ridge level as a board walk, on the westerly slope of Cupola Mountain and the Esplanade Range. To the west the North Branch of Six Mile Creek lay several thousand feet below, while beyond rose some of the most magnificent peaks of the Selkirks, Mts. Iconoclast, Sorcerer, Seraph, Cherub, Sonata and Symphony. Advance was continued along the Esplanade, and a gradual descent made to the headwaters of the North Branch of Six Mile Creek, when we crossed through a narrow snow pass and reached the head of Spinster Creek flowing northerly into Gold Creek. From this pass the first good view of Mt. Sandford is obtained. We advanced for about a mile from the pass, dropping down several hundred feet, and pitched camp beside a beautiful alpine lake, Sunbeam lake. The total distance traversed from the railway was a little over twelve miles, and by getting an early start with light packs it can be made in one day. This is as far as horses can be taken conveniently, and the lake is a beautiful spot for a permanent camp. The rest of the journey must be accomplished on foot. By dropping over the timbered ridge to the west of the lake, then over a range of low mountains lying between Spinster Creek and Bachelor Creek, the valley of Gold Creek can be reached

Six Mile Creek Pass On Road To Mt. Sir Sandford. P.A. Carson, Photo.

Mt. Sir Sandford. From Summit Of Mt. Sonata, Altitude 9500 Feet. P.A. Carson, Photo.

in five hours, even with heavy packs. Before descending into the valley an excellent view of Sir Sandford is obtained, and a tentative plan of campaign may be mapped out. It is very desirable to strike Gold Creek just below where Bachelor Creek enters it from the south, for here there is a small island, and no difficulty should be encountered in crossing the two channels by means of felled trees, although the creek is a rapid torrent. From this point Dr. Shaw advanced up the rough valley of Gold Creek, but I would advise ascending to timber-line in a northwesterly direction, where bivouac can be made at a convenient point for making the final attack on the peak, now only two miles away.

I have viewed Mt. Sir Sandford from three sides, south, east and north. The south-west and north-east slopes are very steep, and seem almost impracticable. The north-west slope of the main peak is a gradual one, but it is too far away for convenience. The northeasterly ridge of the main peak, on viewing it from the south-east, looks almost precipitous, but from the direction of Bush River it can be seen to have a slope not greater than 45 degrees. The photograph illustrating this article was taken at a distance of four miles from the summit of Mt. Sonata (9500 feet), being the mountain immediately south of Sir Sandford. The white outline of the south-easterly ridge is distinctly visible. If one can successfully cross the glaciers and ridges to this south-easterly ridge no great difficulty should be found in conquering Sir Sandford. And all honor to those who achieve the victory!

Regarding the time necessary to make the trip and ascent from the railway, I should say that with no time lost through unfavorable weather or unforeseen circumstances, it could be done in seven days. At the end of the second day the main stream of Gold Creek can be reached and crossed, and camp made at timber-line on the third day. Allowing a day for reconnoitering a route to the main peak, the ascent could be accomplished on the fifth day, back to Sunbeam Lake on the sixth day, and to the railway on the seventh. Provisions should be taken, however, for at least ten days. The attempt on Mt. Sir Sandford should be made between the 15th of July and the 2ist of August, as about the latter date a heavy rain, with snow on the mountains, generally falls in this locality.

Over The Cornice Of Asulkan Snow Dome.

By C. H. Mitchell.

All of us had, in the previous five days of the Rogers Pass Camp, been up either Rogers, Hermit or Sir Donald, with their moraines, rockfalls, couloirs, arêtes and chimneys. The ice and snow work on these climbs had not left as vivid impressions as did the rock work, and if we were to make one more ascent before the close of camp, a lasting impression of a real day on glacier and névé seemed the thing most to be hoped for.

It was with this hope that two of us planned a route to fulfil these conditions, a route different from those any of the previous climbing parties had taken, and the genial President was asked for his sanction and advice. It came slowly. It was a long trip—a very long trip; it was arduous; there were only to be active, strong climbers; it might be dangerous; and there were positively to be no ladies.

But the approval came and the personnel was arranged, and—good! we were to have Hector Wheeler as our guide with a 120 ft. rope, and we were to sleep Sunday night at the Asulkan Camp, that which had been made in the valley at the foot of the glacier, and on Monday we were to do the turn, coming straight “home” to the Main Camp at night—and those who knew, said we would

most surely be late.

It had been a peaceful Sunday at the Main Camp— a bright, quiet day with the stately white clouds floating high above the peaks and the silent places on the mountain sides listening for the far away echoes of the valley. The members of our glacier party slowly broke away from the camp during the afternoon, rambling down to the Glacier House, there to dine perhaps, and on up at their leisure to the Asulkan camp.

Eight-thirty p.m. found the party assembled at the two little tents by the brook side shadowed by cedar trees. One of the party had been carefully instructed as to the whereabouts of the camp, and for fear he might go astray in the twilight a barricade was constructed across the trail at the "turn in." But who, familiar with Canadian outdoor life, could have mistaken the far away signal up the valley, where a thin, blue curl of smoke rose above the dark green tree tops? Any one could have guessed it was the mosquito smudge.

The forefoot of the Asulkan Glacier lay three hundred yards distant and the hollow murmur of its water was our July night's lullaby, and a quick rub down in its icy waters proved a welcome sleep inducer. Not that any inducement was needed, for it seemed but a few minutes, after outdoor things were snug for the night, before all the party had gotten under its blankets with the usual accompaniments of grunts and smothered interrogations as to the whereabouts of sundry articles laid aside in the darkness. He who has even once slept in a bell tent with six other fellows on a dark mosquitoey night, can readily appreciate the sensation and the humour of it, and it can be safely affirmed that the pre-slumbering sotto voce ejaculations, grunts and mutterings of a tented group of gentlemen tenderfeet from the plains and effete civilization are quite the same the world over.

Were you ever entrusted with waking a camp at any morning hour before four o'clock? And did you ever make the mistake of rousing the whole tent an hour too soon because in the half light your watch deceived you? They were not quite all awake at two-thirty, but three o'clock, at the latest, proved after all, none too soon to be up, and at three-thirty a breakfast looked awfully good and tasted better. One is afraid to tell all the good things cook had ready, because it wouldn't be believed for such a place and hour. Then there were the packs of lunch to be prepared—meat and jam sandwiches and oranges and chocolate to be apportioned to the three rucksacks; then the harnessing and the roll call for the start and off we were, up the trail by the brook with just the least glimmer of a four o'clock dawn on the mountain tops.

That first hour did seem pretty steep, up the side-hill pony trail on the slope of the shadow side of the valley until a thousand feet above our night's camp, then across to the right moraine for a steady upward boulder climb and presently out we came on the ice itself for our first halt. We had a chance now to look ourselves well over with real blue ice for a relieving background. We felt ourselves, to see who we were that morning at five o'clock on the famous Asulkan and it did seem hard to realize our make up. First was Hector, with the Stetson crest and mighty stride, then the chivalrous veteran climber, representative of the English Alpine Club, then a Winnipeg lawyer, a Toronto consulting engineer, a Medicine Hat journalist, a Calgary civil engineer, and lastly, as if to shepherd the flock, the minister from Lethbridge. How lightly we trod the long ice slope in that exhilarating air; we will always remember it and it seemed but an early walk to the crest of the glacier where, with eager expectancy to look over, we arrived at seven o'clock and earned a laconic assurance from Hector that previous days, parties on the Asulkan trip had thought well of their efforts to arrive by ten o'clock.

But our day was just begun. We lingered a short while spellbound by the panorama which lay before us glistening in the morning sun; the peaks tipped with rose and the valleys still in

Route Over Glaciers And Snow Dome.

blackness and, above all, the silence. Fox, Selwyn, Feuz, Dawson, Hasler and Michel Peaks, all above 10,000 ft. stood straight before us with Geikie Glacier and Creek before and Donkin and its glacier to our right. We could count opposite us, three great glaciers and several minor ones. Away beyond, to our far right, beautiful Purity stood above her neighbors, the emblem of her name.

Now at 7.45 commenced the real climb and we roped, passing as a start, around a bald cliff to the east as a short cut for the ascent of "Snow Dome," our first objective. This snowcap lies between the Asulkan Crest and the Geikie Névé—back beyond the Illecillewaet Névé—and is about 9,700 feet elevation. Hector said he had not heard of its being climbed previously. It is attractive as a climb in affording a variety of snow and ice work with the added interest of a huge snow cornice on the south side overlooking the Illecillewaet snow-field. Up, up we went on the north face of the snow pyramid. Our impression was that the snow slope was dangerously steep, Hector said upwards of 60 degrees in places, and were it not so early in the morning and on the cool side, we might not have gone up without incident. What a ceaseless plug, plug a steady climb

on a steep snow slope is; one looks down, if at all, with a feeling of fitness to slide if forced to the opportunity, and looks up with the hope that his guess is correct that he can come down some other route than this.

Just as you round the shoulder of the dome at the crest of a snow-capped peak is probably the most interesting moment of the ascent. The expectancy of the panorama to be unfolded when, in a few minutes, you actually reach the top and can look over beyond, lends a quickening step and perhaps sometimes a careless hurry. On Snow Dome we had this thrill, but it was tempered with the knowledge that the opposite side was corniced and our steps at the crest were wary. On top a cold east wind was blowing and, notwithstanding the heat of the ascent—it was by now ten o'clock—we found our rope quickly freezing and we got inside all the spare clothing we had. We ate our lunch with contentment and relish; were we not set high in the midst of a huge circle of famous peaks, the giants of the Selkirks, and were we not in sight of eight as famous glaciers, not to speak of the many smaller blue masses clinging over the steep cliffs? And in front of us lay the Illecillewaet Glacier and Névé.

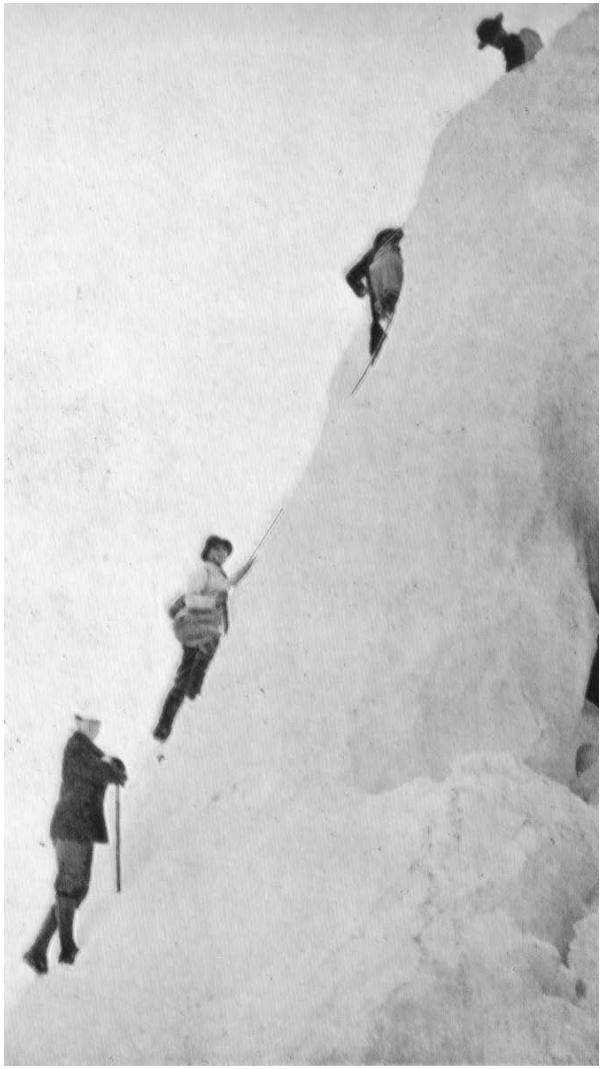
After the last sandwich had been taken, there seemed to come that quickening thrill which brought the thought of the descent. A cornice! "Going over cornices is one of the most dangerous feats of mountain climbing," we had read on Sunday in George Abraham's "Complete Mountaineer," and we had seen with our glasses that the south face was corniced clear from the Geikie Crest to the great punch bowl hollow at Lookout. Could we get over, across or through? The first move was downwards towards Lookout, feeling for a suitable chance. The first time that Hector made a reconnaissance over the edge, we really began to think of our responsibilities as we anchored ourselves and the rope in a long line back over the crest, while he, on about forty feet of clear rope, crawled and squirmed out to the edge to look over. In the later similar operations, we gradually learned to let out the slack rope and advance it with caution ready for the sudden plunge if it came with the breaking of the cornice.

Down and back we trudged and clambered along the snow crest, feeling for the hidden place we hoped was there to be found. Once away down near the Lookout we got for a few minutes on real rock while we examined the chances for following around the cliff of the bowl of the névé. Then, back up the snow ridge again, making trial after trial, when suddenly, Hector's hand shot up as he hung over the slope, which told us he had found a place where for about thirty feet the cornice had broken away and we could probably clamber down the snow face. We could—and did. It was an exciting operation, not without danger. There was upwards of forty feet of almost sheer snow face to be descended to arrive at the top of the sloping snow-talus which lay at an angle of probably 65 degrees.

Over we went, one at a time, working down the face, using footholds Hector had cut on his first trial trip down, and the rest holding and anchoring the rope above. The first two down carried the four cameras of the party and secured photos of the others coming over. The cornice in breaking, had left a good mass of fairly level snow at one side where we gradually assembled awaiting the downcoming of Hector who was last. We wondered how he would do it—would he leave his ice axe at the top, as an anchor for the running rope? Nothing so romantic did he do; he merely slid down the face with the axe and rope just about as one would slide down the side of a brick business block from the eaves and, to our amazement, landed on his two feet in the snow with an imperturbable smile.

So we got over, and with an almost fond farewell, strode down the easy side slope to the lower levels and out on to the névé, a thousand feet below. A short look back showed the alpine

The Last Sandwich. C.H. Mitchell, Photo.



Descending The Cornice.

object lesson, that things frequently look more impossible from afar off than they really are. Then began the long trudge across the névé en route for Terminal Peak, the southerly shoulder of Sir Donald. We had hoped to climb this shoulder as part of our long day's work and would have done so, but, that when we arrived below it after our four-mile tramp across the snow-field, we were chagrined to find a sudden rain and mist come on, beginning to dangerously shroud it and the adjoining peaks and, discretion being the better part, we reluctantly gave it up and promptly started downwards and homewards.

Threading our way along the crevasses and danger spots of the Illecillewaet Glacier we eventually brought up at Parley Rock, 7900 ft., and had our first drink of water for many hours. We unroped here at 3.45 p.m., and were surprised to find that we had been constantly on the rope since 7.45 a.m.—eight hours. By this time it was raining hard and steadily and we lost no time in clambering and glissading down the steep snow slopes below Perley Rock, some fifteen hundred feet to the right moraine near the foot of the glacier. Here, in order to save time, instead of struggling down through the gigantic boulders, we undertook to cross the face of the timbered slope to the couloir below Sir Donald, but this was "out of the frying pan into the fire." It was an hour longer—it seemed five— and ten times wetter in the underbrush, until finally in desperation we waded down a small torrent bed which was momentarily becoming more swollen and, crossing at the junction of the large stream, finally got on to a pony trail, arriving at Glacier House, three miles distant, at 6.45 o'clock, with still three miles more to the home camp.

We could be absolutely no wetter. We might have been more hungry and more tired, but we could not have been more satisfied or happier than when, at eight o'clock we arrived in the main camp at Rogers Pass after a continuous sixteen hours of going from the Asulkan Camp in the early morning, over ten hours being on ice and snow.

SCIENTIFIC SECTION.

Modern Glaciers.

By Wm. S. Vaux.

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The study of glaciers, including their present changes and the part they have taken in fashioning the earth's surface, may be broadly divided under two great heads. One deals almost exclusively with the science of geology, and embraces a consideration of changes in the earth brought about by the activity of glaciers which may have ceased to exist ages ago. The other treats of glaciers as they are found today, the properties of ice, the laws which govern formation, flow, and dissipation, and deals with physics and physical laws.

The second of these great branches will largely occupy attention in the present paper in explaining what a glacier is, illustrating its principal characteristics, and giving a brief summary of the history of glacier investigation. Lastly, the plan of observation on some of the glaciers on our own continent will be explained by which these movements and changes have been recorded, and some of the laws of glacier action again applied to new examples.

The popular conception of ice as a hard, unyielding substance is in fact totally wrong. Ice is really viscid, and will slowly yield to pressure if not intense enough to rupture it, but will crack and split if the pressure is suddenly applied or its direction changed.

This is the case in compression, but the yielding to tension is very small, and is followed by a more or less complete rupture. Indeed, a mass of ice may be compared with tar, which, though solid and firm, is brittle under tension, but plastic under compression, and will change its form until the pressure is relieved. This property of ice may be considered the fundamental one which permits masses at high altitudes to assume the flow of a river and drain away into the warmer valleys below.

In general, it may be said that a glacier is a mass or stream of ice formed in regions of perennial frost from compacted snow, which moves slowly downward in a manner analogous to a river over slopes and through valleys until it melts away, owing to higher temperature at the lower levels, breaks off in the form of icebergs on the border of the sea, or avalanches over cliffs to the valley below.

It is only under favorable conditions that glaciers are formed—an average temperature below 32° F., a high yearly precipitation, and a climate which allows an accumulation of snow in excess of the amount melted, evaporated, or blown away. Outside the Arctic regions these conditions are found only at high elevations, and it is for this reason that with high mountain ranges and rugged peaks one mostly associates snow-field, glacier, and moraine.

Glaciers may be divided according to three principal types: Alpine, where the snow is at a considerable elevation on a mountain side, and the stream flows through a valley to the open slopes below. This type is the most widely known, and was first studied in the Swiss Alps, where the name was applied. Piedmont, where several alpine glaciers unite and spread out over the adjacent valley or plain; and Continental, where vast areas, or even entire continents, are covered. Examples of the third type are at present to be found only in the Arctic and Antarctic regions, but in past ages they were more numerous and extended; the great ice caps over North America being excellent examples. It is with the alpine and piedmont types that we shall deal in the present discussion, as apart from being more readily accessible, they exhibit the glacier characteristics which are to be illustrated.

A glacier being a river of ice, its source is at a high elevation where snow falls throughout the year, and for a large portion of the time the temperature is below freezing. There being no melting, the snow becomes deeper and deeper and an indefinite accumulation would in time take place, were it not that pressure from the increasing load above and many changes of temperature close to the freezing-point begin the direct transformation of snow to ice without melting of the whole mass. Then begins the slow and constant motion or flow to the lower levels. More snow falls on the surface above, forming a vast field resting on the mountain-side, while below is a mass of solid ice—the birth of the glacier. This snow-covered portion is known as the accumulator or névé. Following the course of the ice-stream, a point is reached where owing to increased temperatures and lower elevation the accumulations of snow on the surface melt before a large amount has collected, uncovering the stream of solid ice, which becomes visible, and here the dry glacier begins. Below the snow line to the tongue or snout where the glacier melts away there is surface melting, and the phenomena of ice action may be studied in full view. This lower portion is known as the dry glacier or dissipator.

Glaciers may be simple or compound as they drain one névé into one valley, or are made up of a number of individual streams each filling a separate valley with a common snow-fields. Conversely, several névés may be drained by glaciers in valleys which finally join and form one ice-stream.

The crystalline structure of the ice composing a glacier is very different from that frozen

Asulkan Glacier. Showing Neve, Ice Fall, Tongue And Moraines. Vaux, Photo.

in the ordinary way. The snow falling at high altitudes is usually of a hard spherical form, similar to hail, which is compacted together by pressure and slight temperature changes till it assumes a banded or stratified form of solid ice with a peculiar grain and structure which instantly distinguish it from lake or river ice. Near the tongue the grains become larger, but are crushed together and deformed as in a mass of marble.

The snow when it first falls exhibits no bands or stratification. Alternate melting and freezing and the deposit of dirt on the surface blown from cliffs form stratified layers of clean, dirty opaque, and clear ice, the bands of which dip at an ever-increasing angle as it descends. Near the tongue these bands become obliterated, the ice being of an even clear texture, interspersed with lines of dirt or faults formed by cracks in the ice which have afterward closed.

The beautiful coloring of pure glacier ice is universally noted, and also peculiar bandings of the clearer sections, which do not appear in the névé, but become marked in the lower regions, and disappear before the tongue is reached. These are known as blue bands, and their formation has long been under investigation. They are not equally marked at corresponding points in different glaciers and their position and direction do not appear to follow known laws. The suggestion of Prof. Louis Agassiz, that they are formed as a result of horizontal pressure in the ice similar to cleavage in slate, has been accepted for many years. Recently theories have been advanced to prove that they are analogous to strata in the ice, or that they are the result of a modification in the névé stratification.

Above the névé line, owing to absence of melting, the tendency is for the ice to become thicker and to bury rock or other substances which may rest on the surface.

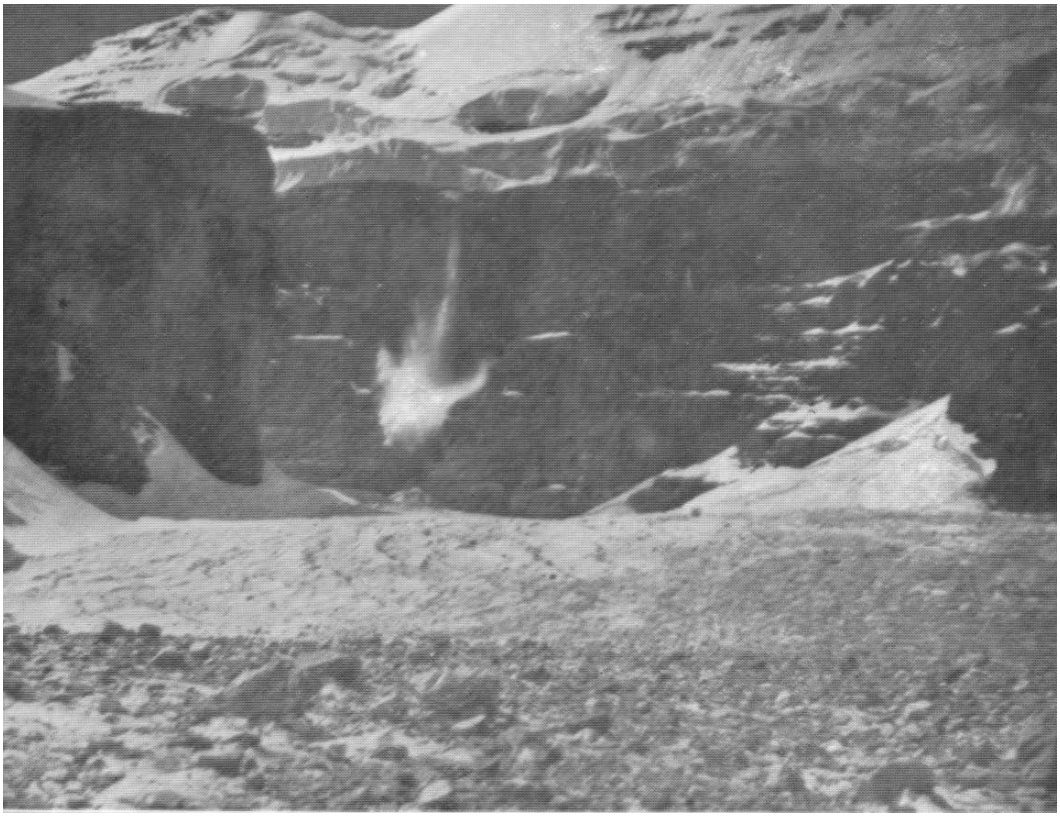
Below this line the conditions are reversed; melting takes place which constantly removes the upper layers of ice, and the flowing motion below gradually brings these buried substances to the surface. It is for this reason that the upper slopes of glaciers are generally white and clean, white below they are often buried deep in debris.

Two of the most striking characteristics of glaciers are crevasses and moraines. Owing to the impossibility of ice yielding to tension except in a very limited degree, some provision must be made for uneven flow.

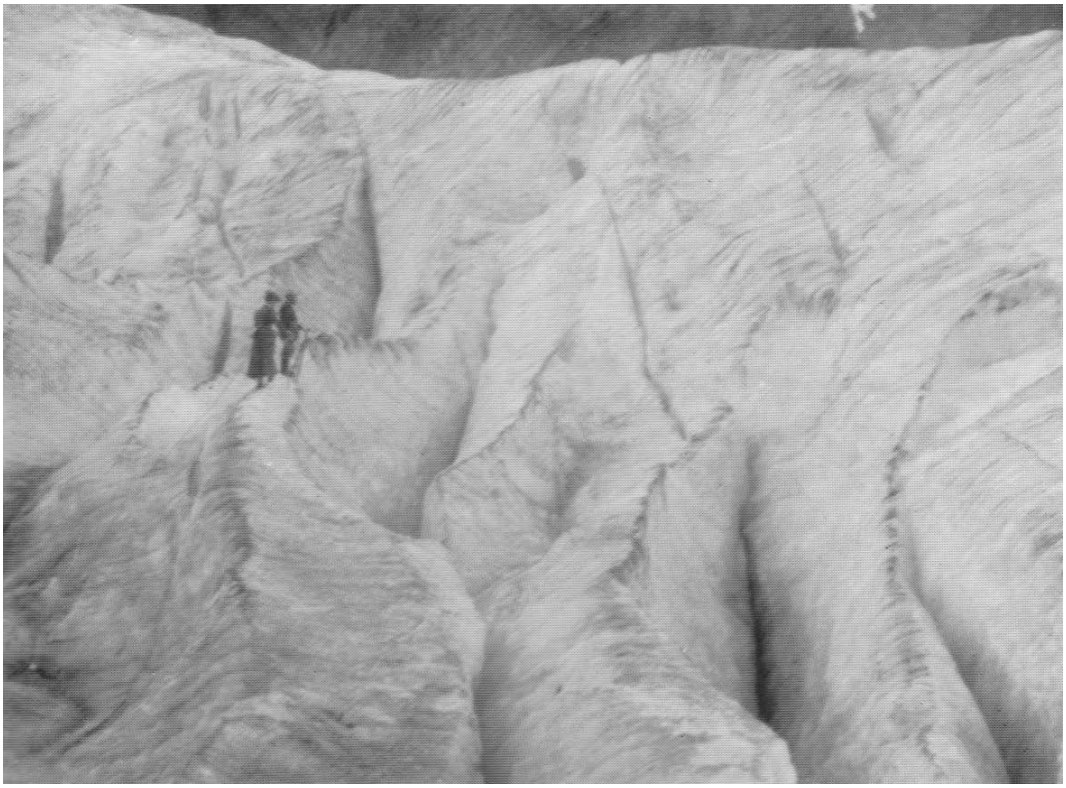
As the glacier flows over the rock-bed or reaches a space of increased incline, tension is exerted in the ice which causes a rupture. The cracks, but a hairbreadth wide at first, are enlarged by melting and changes of slope, till they may be hundreds of feet in length and many feet deep and broad. These are known as crevasses (Plate 2), and they are formed in the partially consolidated snow, in the ice beneath the snow, or in the dry glacier itself. Early in the season the crevasses are filled with snow, which later melts, and snow-bridges are formed. These are at first strong and solid, but soon melt away from below and form treacherous pitfalls for the explorer. Crevasses may run in any direction, and often form a maze on the ice surface through which it is hard to thread a way, and where the greatest caution is necessary. When these cracks occur at angles to each other pinnacles of ice are formed. Melting takes place on the four sides thus exposed to the air, and séracs are formed, named from a fancied resemblance to clotted cream. These often assume the most fantastic shapes after the erosion of wind and water has worn them away. (Plate 3).

Passing over an uneven bed the body of the glacier is first bent in one direction and then in the other. When the slope increases great openings are formed across the glacier which are known as transverse crevasses, as they usually occur nearly at right angles to the direction of flow. The ice at this point may form in great steps with crevasses between them. This is known as the ice fall.

When the slope is almost constant no crevasses are formed from this cause, but the more



Avalanche Victoria Glacier. The Ice Is Here Falling 2500 Feet And Forming A Secondary Glacier Below. Vaux, Photo.



Crevasses, Illecillewaet Glacier. Vaux, Photo.

rapid flow at the centre than at the sides causes a stretching at this point and marginal crevasses result.

Again, crevasses may be found where a glacier after passing through a narrow defile spreads out into a wider space which allows it to expand laterally with a corresponding decrease in motion. The pressure of the ice behind produces a tension in the ice which forms longitudinal crevasses.

Between the main stream of the glacier and the bordering cliffs deep and broad openings similar to crevasses are almost always found. These are known as bergschrunds or mountain crevasses, and they may occur close to the rocky cliffs or several rods distant, a portion of the névé being closely attached to the rock wall.

At times narrow cracks or even large crevasses are filled with water which freezes and forms a solid mass. They are very noticeable on the dry glacier and are known as dykes. The ice so frozen is often composed of long crystals the axis of which is at right angles to the plane of the crack, or may be of the glacier form after having been subjected to pressure.

The walls of crevasses where there has not been much melting are often of the most exquisite turquoise blue, which deepens to black in the farthest depths. Frequently icicles are formed which hang row on row with silver-white or blue bands and wreaths. When the sunlight enters one of these chasms, every point and drop reflects the light, while deep pools of water make it seem like an enchanted fairyland. It has been said that only the unfathomable sea rivals this exquisite coloring and setting.

While not strictly connected with our subject, a peculiar phenomenon often noticed on the higher névés is red snow. This is, in fact, a vegetable growth in the snow itself, which at times covers many acres of surface. It is often covered with a layer of fresh fallen snow and its presence is not suspected until foot-marks or the scraping of the ice-axe uncover it. There are said to be several species, each with its own locality and limits.

The transporting power of glaciers, at one time seriously doubted, is now universally accepted. The immense amount of rock deposited in valleys and plains bears witness to the part played in the past, while the masses carried, polished, and ground at the present time show how the work of ages has been accomplished. All glacier-transported material is known under the head of moraine. There are two main divisions, indicating whether the material is fixed or is changing with the motion of the ice, and these are again classified according to their position relative to the glacier. If at the tongue, they are known as terminal; at the side, lateral or marginal; beneath, sub-glacial or ground; while two lateral moraines coming together when ice-streams join and flow as one are known as medial moraines. The amount of transported material varies greatly, some glaciers being almost free, and others so covered that they resemble plowed fields. The proximity of disintegrating cliffs or rocky walls from which masses break off produces moraines, while an absence of such cliffs forms a clean glacier, the tongue of which may not be buried. Moraines are often of great height and length, but generally of a triangular cross-section ending in a ridge with the masses of rock just at the angle of repose. Often they appear to be solid, but really rest on a stagnant core of ice which gradually wastes away, and the slow shrinking starts masses of rock and dust which avalanche down the sides. Large isolated rocks or boulders are usually found resting on the surface of the ice, firmly fixed on the crest of moraines or resting entirely apart from the other debris in the valley bottom below. These are known as erratics, and they often show the results of enormous pressure by their polished and grooved surfaces. At times the rock in place is scratched and polished, or worn off in mounds which fancifully resemble the backs of sheep, and are accordingly known as roches moutonnées.

Seracs, Illicellewaet Glacier. Vaux, Photo.

Glacier Table, Victoria Glacier. Vaux, Photo.

Moraine and crevasse make possible many minor glacier phenomena. A bed of moraine over a foot thick acts as a blanket and protects the ice below from the sun's rays. Thus many moraines are really of ice with a coating of rock. A large rock protecting the ice below while the surrounding surface is melted away rises on a pier until it may reach a height of several feet. Always tipping to the south, the rock finally falls, owing to the melting away of the pillar below, and the process is repeated. These are known as glacier tables. (Plate 4). When the rock is small the reverse is the case, and it sinks into a hole filled with water melted by the heat absorbed. A mass of sand collected at the foot of a water-fall in the ice gradually comes to the surface and a sand cone is formed, of a thin coating of sand and a core of ice. (Plate 5.)

The ice meltings find a way to the depths of the glacier through crevasses, but at more level portions, where there are no openings, small streams collect which flow on the surface until a crevasse is reached. These streams may assume considerable proportions; canyons are formed with potholes and caverns through which water rushes with great force owing to the smooth sides. At a crevasse the water leaps down in a moulin, or perhaps a hole carries it to the depths below. (Plate 6.) The water melted from the glacier collects in streams below the ice and flows on the ground moraine till it issues at or near the tongue. Great caverns are melted out as a result of the water or air currents, and at the point where the stream issues a beautiful ice arch may be formed. (Plate 11.) In the spring these arches are often of great size, but later in the season the ceilings fall in.

Glacier water may be readily distinguished from that melted from snow by its gray, muddy character. This is caused by the suspension of a large amount of fine mud which has been ground from the rocks and cliffs. In the course of the stream this mud is deposited in flat places, and gradually fills up the lakes which often lie below glaciers. Further down the streams become clear and lose this characteristic owing to the filtering out of suspended material, but a small amount of mud always remains, and its presence is said to cause the vivid tints of the lakes, which when fed by glaciers often rival in coloring the ice itself.

The flowing motion of glaciers already referred to involves a most difficult problem in ice physics which is not yet thoroughly solved. No fewer than nine theories have been advanced to explain the phenomena observed. It is not within the province of this paper to attempt more than a brief description of phenomena, the obscure problems of the causes which produce the effects being left for those who desire to delve into them. The observed facts, however, show that the motion of a glacier resembles closely the flow of a river, except that it is much slower and only observable by the aid of instruments of precision.

As in a river, all portions do not move with the same rapidity. The surface moves faster than the bed, the centre than the sides, and where a bend in direction is met, the concave side lags till the convex assumes its proper place. Indeed, it may be said that no two parts of a glacier travel with the same rapidity, for at a broad, open space the rate is slow, while a narrow, deep gorge accelerates the motion till the ice is broken into rugged masses, owing to the enormous pressure exerted. Again, the surface melting snow below the névé line tends to bring to lower portions to the surface, and in the dissipator there is a gradual motion from the centre to the sides. In the upper sections of a glacier the flow is least and increases to the névé line, where theoretically it is a maximum, and then decreases to the tongue. Where moraines and embedded rocks are not present the rate of flow is greater than where the glacier is heavily bedded in moraine or filled with rock.

These motions are constantly at work, but they do not act with the same speed at all times. Higher temperature may mean accelerated speed, and the summer flow has been proved in certain cases to be more rapid than the winter, and the day motion than the night, though the causes of

Sand Conde, Victoria Glacier. Vaux, Photo.

Moulin, Illecillewaet Glacier. Vaux, Photo.

these changes are not as yet fully understood. Over a series of years the rate of these motions is found to vary, increasing for a time and then decreasing, passing through many changes in the course of a century.

Varying climate, precipitation, and rate of flow are principal causes of glacier variation, which is now being investigated with great care. It is everywhere evident that in former times glaciers were of much greater extent than at present, and that there has been a decrease and shrinkage for many years. Valleys below glaciers, now covered with trees hundreds of years old, were in former times the bed of moving ice which bore down and deposited erratic and moraine. Lakes plowed out by immense force show where the ice masses once crushed together and then retreated and melted away. These changes depend upon the rate of flow of the ice, the amount supplied from the névé region, and the quantity melted away at the tongue. If more ice is supplied than is melted, the glacier advances; while if the melting exceeds the supply, the glacier retreats. Temperature, precipitation, and sunshine modify the result, so that many factors are at work to determine whether a glacier advance or retreat. These changes are independent of the daily and yearly variations, though they appear to be the result of similar forces acting over longer periods of time.

Careful observation extending over years has shown that after a time of retreat the ice begins to thicken in the névé region, the rate of flow quickens, and a great wave of ice flows to the tongue, which advances over the space formerly left bare. The glaciers in one locality do not all change at the same time, but some may advance while others retreat. It is, however, believed that the same cause in the névé is applied to all, but owing to size, length, normal flow, and other conditions the effect does not become apparent at the same time. Advances in many glaciers have been noted at periods of about thirty-five years, and this interval is known as “Bruckner’s period,” though it can as yet hardly be considered as a fixed rule of glacier change except from theoretical considerations.

Prior to 1811 no general records of the variations of glaciers are preserved. In 1812 there was a general advance of all the glaciers of Switzerland, which reached a maximum in 1825. This is the greatest advance ever observed. A period of decrease then set in, not marked or universal, which was followed by a less decisive increase, which reached a maximum about 1850. Then followed a marked period of decrease, and in 1870 all the glaciers were positively retreating. From 1875 a new phase set in, certain glaciers began to advance and others to retreat. This condition continued till 1894, when decrease became almost universal, and has continued more or less positive in character till the present time.

An illustration of the apathy of thinking men in the middle ages is shown by their lack of interest in natural phenomena. Roman engineers built roads through Switzerland, traveled them for centuries, and bridged and crossed glacier streams and even glaciers themselves with only the most remote references to their existence. The history of glacier investigation extends back barely more than two hundred years, for while Munster in 1544 and Schenckzer in 1707 advanced theories as to the structure and movements of glaciers, their ideas were crude and founded on wrong conceptions of actual conditions. DeSaussure in 1803 published in his “Voyages dans les Alpes” the first serious description of glaciers, based upon his own observations and deductions. At this time motion and variation were imperfectly understood, while until many years after it was thought that glaciers existed only within the confines of the Swiss Alps.

Charpentier in 1841 published his studies on the former great extension of the Rhone glacier from its valleys into the plains beyond, and this work drew to the attention of scientific

men that problems of universal interest in glacier action remained to be solved. Hugi had lived in a hunt on the ice in order to study the marvelous forces which were at work, an account of which he duly published. About this time Prof. Louis Agassiz, who had been occupied with zoology, turned his attention to present glacier action as a means of determing the past history of the earth. He saw that careful observation of present conditions would develop definite general laws which would apply for all time, and he set about to find the real nature of the movement of the ice-stream which had previously been assumed by observation of masses moving along on the surface. To him must be accredited the first scientific work in observing the movement of glaciers by means of stakes driven in the ice. Surface melting was unintentionally proved by all his stakes melting out of the ice and falling, but he persevered, living in a hut on the glacier, where he received many scientific men as his guests. His "Système Glaciaire," published in Paris in 1847, describes in detail the work, and is a classic in the literature of glacier investigation. As a guest of Agassiz, a physicist and surveyor, Prof. J. D. Forbes, first made the acquaintance of existing glaciers. He saw that with instruments of precision the work which Agassiz had laid out could be performed in days instead of years, and on the Mer de Glace he placed a row of stakes, and a month later proved the motion of the ice, and that it is greater at the centre than at the sides, resembling the flow of a river. With the subsequent bitter controversy as to priority of discovery we have nothing to do, but the laws laid down and the phenomena recorded at this period stimulated an interest in glacier study which has continued to the present day.

About this time Rendu, who had long been a student of glacier action, published the results of his investigations in "Théorie des Glaciers de la Savoie," in which he developed laws entirely independent of outside sources. The reason for motion and the real functions of moraines formed at this time the active problems for discussion, and many theories were advanced and argued, attributing glacier phenomena to different causes. Tyndall and Croll each developed theories of motion which attempted to reconcile observed facts with known physical laws, but all pointed to the importance of a systematic study of the subject with physical and mathematical considerations always in mind. This implied also a careful, painstaking observation of changes as they took place and a record compiled of all the data obtained. Prof. F. A. Forel, of Lausanne, realizing the value of such investigations, published in 1881 a memoir in which he laid down the fundamental laws of glacier variation and appealed to those interested in the subject to assist him in completing the records. In August of 1894, under the leadership of the late Captain Marshall Hall, the International Congress of Geology appointed a committee to systematically collect data and record facts relating to glaciers and their changes. This is known as the Commission International des Glaciers, and for a decade has collected data from all parts of the world and reduced it to a form for comparison. Bruckner, Richter, Finsterwalder, Forel, Reid, Hess, Russell, and many others have contributed to the general store of knowledge, by observation on glaciers themselves, deducting laws from the information received, or developing the mathematical considerations which are intimately associated. The systematic observation of over one hundred glaciers, situated principally in Switzerland, but distributed generally over the globe, will in time provide the data from which correct ideas of glacier phenomena may be deduced.

It must be borne in mind that the forces studied have acted for untold ages, and that the contributions of one observer or even one generation of observers taken singly will form but a slender basis upon which to weave ultimate results. Only by an intimate knowledge of the physics of ice, the changes in climate, and the results which these changes have upon existing examples will it be possible to correctly deduce the laws which have taken such an important part in preparing the

surface of the earth for the habitation of man.

The foregoing outline of the characteristics of glaciers and the way in which they have been studied may serve as a prelude to a brief description of the conditions which form great ice-streams in Alberta and British Columbia, upon several of which measurements have been made. While these glaciers do not compare in size with those of Greenland, Iceland, and Alaska, they may yet be taken as average examples of the alpine type.

Excluding the territory which lies to the north of the Arctic circle, all the principal glaciers of North America lie within the great ranges of the Rocky Mountain cordillera. These ranges, stretching from south to north along the Pacific coast, are well located for the formation of glacier streams on their western slopes. Mountains such as Lyell, Hood, and Rainier within the United States bear glaciers near their summits, but it is only to the north of the boundary with Canada that the conditions become truly alpine and glaciers exhibiting all the phenomena are to be found. The course of the ocean currents in the Pacific and the position of the mountain ranges near the coast are both favorable to the formation of glaciers of great extent. The Japan current, flowing north some hundreds of miles from the coast of California, gradually approaches the continent till the western shores of British Columbia and Alaska are bathed by its warm waters. Warm winds blowing eastward gather up the moisture and carry it inland, where the Rocky Mountain Cordillera is crossed, here composed of four ranges—the Cascade, Gold, Selkirk, and Rocky Mountain. Each succeeding range from west to east is higher, and these moist, low-lying clouds lose their moisture on the western slopes, thus causing a heavy precipitation. This falls mostly in the form of snow, and supplies the névés, which in turn feed the innumerable glaciers of the district. Clouds in higher strata pass above the highest ranges, and later their moisture is deposited on the great wheat plains of Alberta and Manitoba.

Until the completion of the Canadian Pacific Railway in 1885 the glaciers of this region were practically unknown. Mackenzie in 1789, and Capt. John Palliser in his expeditions of 1857-59, with their many branch excursions under the leadership of Sir James Hector, naturally kept mostly to the valley levels far below the tongues of the largest glaciers, as their object was to find an easy route for a wagon-road between the Pacific and the plains to the east. But in order to meet the requirements of railway engineering, mountain passes had to be crossed, and thus glaciers which rival those of any other section in interest were brought within easy reach. The most accessible of these lie close to the main line of the Canadian Pacific Railway at Glacier House, a station about 500 miles east of the western terminus at Vancouver. Several glaciers are within a short distance of this point, but the one most readily reached is the Illecillewaet, the tongue of which is but one and one-half miles from the hotel. Prior to 1883, when the pass bearing his name was discovered by Captain John [Major Albert Bowan] Rogers, the foot of man had probably never trod its valleys, as the course was many miles from the usual route, following down the Columbia River. During railway construction the glacier was doubtless often visited by those stationed on the work, but no records were made until July 17, 1887, when our party, passing through, roughly mapped the tongue and made a photographic record of the conditions as they existed. (Plate 7.) At that time the ice completely covered the ground moraine as far as the ridge of boulders, among which alder bushes were growing. The slope of the ice at the tongue was very steep, and the proximity of alder bushes of considerable age close to the border proved that the ice had been in a maximum position for many years. The next year (1888) the Rev. Wm. S. Green spent some time in the district and noted that the glacier had receded somewhat from the year before. He daubed tar on boulders bordering the ice which are marked “T.T.T.” on the map, and made a rough determination of the

flow at a point above the tongue by means of stakes drives into holes. After twelve days a stake near the centre moved twenty feet, and at the side seven feet. These daily movements are greater than those recently recorded at similar locations when the glacier is evidently retreating.

In 1894, when we again visited this glacier, it was evident that retreat had taken place and changes occurred which we were then at a loss to account for. Our interest was again excited when in 1897 we found still greater changes, which resulted in yearly visits since, including the summer of 1906, and the preservation of careful records of what is taking place. (Compare Plates 7 and 8.)

These may be divided under several heads: "Recession and Advance"; "Rate of Flow"; "Topographical Map"; and "Photographic Record."

In glaciers similar to the Illecillewaet the recession or advance of the tongue between two dates is a simple matter to determine. Being almost free from morainal material, the tongue extends on an almost flat ground moraine and melts away to a point. From year to year this point moves to the right or to the left, but its position being readily found, the distance to range lines between marked rocks is easily obtained. The selection of these range rocks is a matter of great importance, for while the general tendency of the glacier may be to retreat, the winter advance may be sufficient to engulf the boulders and push them down to obliterate the marks entirely. The rock marked "C" on the map[2] has been used as a base from which to measure the changes in this glacier since 1898, but in order that no changes might take place in it a range line between "B" and "D" just touched the tongue the same year, and a careful comparison of angles at once makes any alteration in the position of these boulders apparent. Since 1898, and almost certainly since 1887, the glacier has receded each year, but records are available only since 1898, as shown in the following table:—

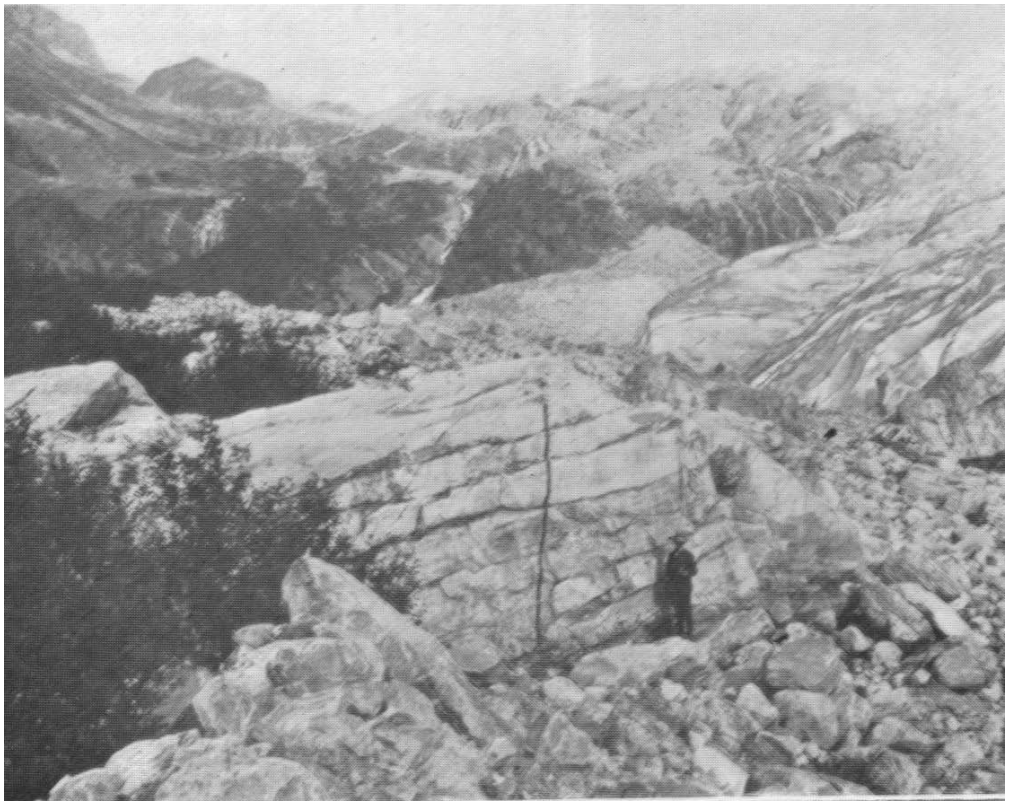
Illecillewaet Glacier. — Recession of Tongue of Ice from Rock "C."

Date of Observation	Distance Tongue of Ice to Rock "C"	Recession of Ice since Previous Year
August 17, 1898.	60ft.	—
July 29, 1899.....	76ft.	16ft.
August 6, 1900.	140 ft.	64ft.
August 5, 1901	155 ft.	15ft.
August 26, 1902	203 ft.	48 ft.
August 25, 1903.	235 ft.	32ft.
August 14, 1904.	240½ ft.	5½ft.
July 25, 1905.....	243 ft.	2½ ft.
July 24, 1906.....	327 ft.	84ft.

An interesting point is that the recession from 1890 to 1898, when the yearly record was begun, averaged 56 feet a year, while from 1898 to 1906 it averaged but 33.3 feet, or about three-fifths.

2 The map here referred to was published with a paper entitled "Glacier Observations," by 'George and William S. Vaux, Jr., in 1907. See page 148, Vol. 1, No. 1,, Canadian Alpine Journal.

Rock "E", Illecillewaet Glacier, Partly Bedded In Ice, July 17, 1887. Vaux, Photo.



Rock "E", Illecillewaet Glacier, August, 1899, Showing Shrinkage Of Ice. Vaux, Photo.

To determine the rate of flow of the ice on the surface at a line above the tongue a much greater length of time and more care are required. Many observers in Switzerland, and Rev. Wm. S. Green on this glacier, as previously noted, bored holes in the ice and planted poles at certain intervals, which required constant resetting to keep them in place owing to the rapid melting away of the surface. Recently steel plates about six inches on a side have been used, which lie on the surface and sink in slightly, thus securing a firm hold, and the motion over any stated period nearly indicates the motion of the ice below.

In 1899 a row of eight plates was laid out at a point about 1,300 feet above the tongue. On the high right moraine the upper end of a base-line 229 feet 5 inches long was located, the lower end being further down on the same ridge. From both ends of this base-line all the plates could be seen, as well as most of the points on the ground moraine below the tongue. The centre of a very prominent tree far up on the cliffs at the left side furnished the other end of the line on which the plates were laid out, a light mountain transit at each end of the base-line giving the locations without measurement on the ice. After thirty-six days the positions of these plates were noted and the amount they had moved from the straight line measured by means of steel tape. These showed the maximum motion near the centre to be 6.79 inches per day, and the minimum near the right side, 2.56 inches.

These plates were again measured in 1900, 1902, 1903, and 1906, when it was found that but one remained on the ice, all the others having fallen into crevasses and been lost or rested on the border moraine. The following table shows the total yearly motion, and the average daily advance from the period when the location was previously made:—

Illecillewaet Glacier.—Table Showing Motion of Line of Plates, 1899 *to* 1906.

Number of plate	Position of plates July 3, 1899	Distance below original Line on August 6, 1900	Daily Motion 1899-1900	Distance below Original Line on Aug. 26, 1902	Daily Motion -1900-1902	Distance below original Line on August 28, 1903	Daily Motion -1902-1903	Distance below original Line on July 12, 1906
1	On line	1044 in.	2.82 in.	3456 in.	3.21 in.	Lost	–	Lost
2	On line	1488 in.	4.00 in.	4446 in.	3.94 in.	Lost	—	Lost
3	On line	1716 in.	4.64 in.	4848 in.	4. 18 in.	6216 in.	3.73 in.	On border moraine
4	On line	2112 in.	5.71 in.	Lost	—	Lost	—	10.200 in.
5	On line	2220 in.	6.00 in.	5850 in.	4.84 in.	7740 in.	4.87 in.	Lost
6	On line	2280 in.	6. 16 in.	6312 in	5.51 in.	8388 in.	5.65 in.	Lost
7	On line	2160 in.	5.84 in.	6504 in.	5.79 in.	Lost	—	Lost
8	On line	2040 in.	5.51 in.	Lost		Lost	—	Lost

These motions have also been plotted on the map and show graphically the greater motion of the central portions, and that the right or concave side moves more slowly than the left or convex.

In the summer of 1906 a new row of six plates was laid out on the line of 1899, and after an interval of twelve days the maximum motion near the side was found to be 7.00 inches per day and near the centre 11.33 inches. A comparison of the summer motion in 1899 and 1906, when tabulated in the following schedule, shows that the motion of the glacier at the present time is greater than it was in 1899, although less than the results of Dr. Green in 1888 would indicate. What effect this will have on the position of the tongue and glacier outline time alone will show.

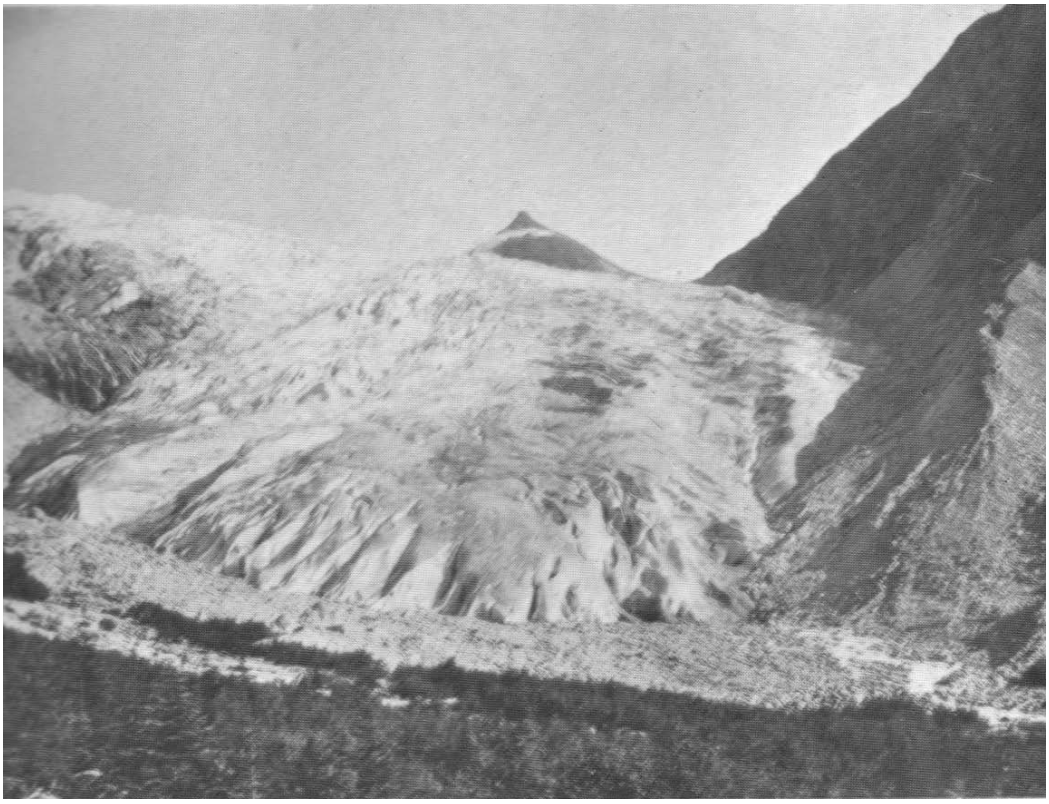
Table Comparing Summer Daily Motion of Plates on Illecillewaet Glacier, 1899—1906.

1899— THIRTY-SIX-DAY INTERVAL			1906 — TWELVE-DAY INTERVAL		
Number of Plate	Ft. from 1986 Ice Edge	Average Daily Motion in Inches	Average Daily Motion in Inches	Ft. from 1906 Ice Edge	Number of Plate
1	187	2.56	Plate lost	92	1
2	415	3.90	7.00	276	2
3	520	5.51	11.33	532	3
4	668	6.77	9.75	727	4
5	760	6.06			
6	900	6.79			
7	956	6.16	10.25	1020	5
8	1220	6.00	8.85	1171	6

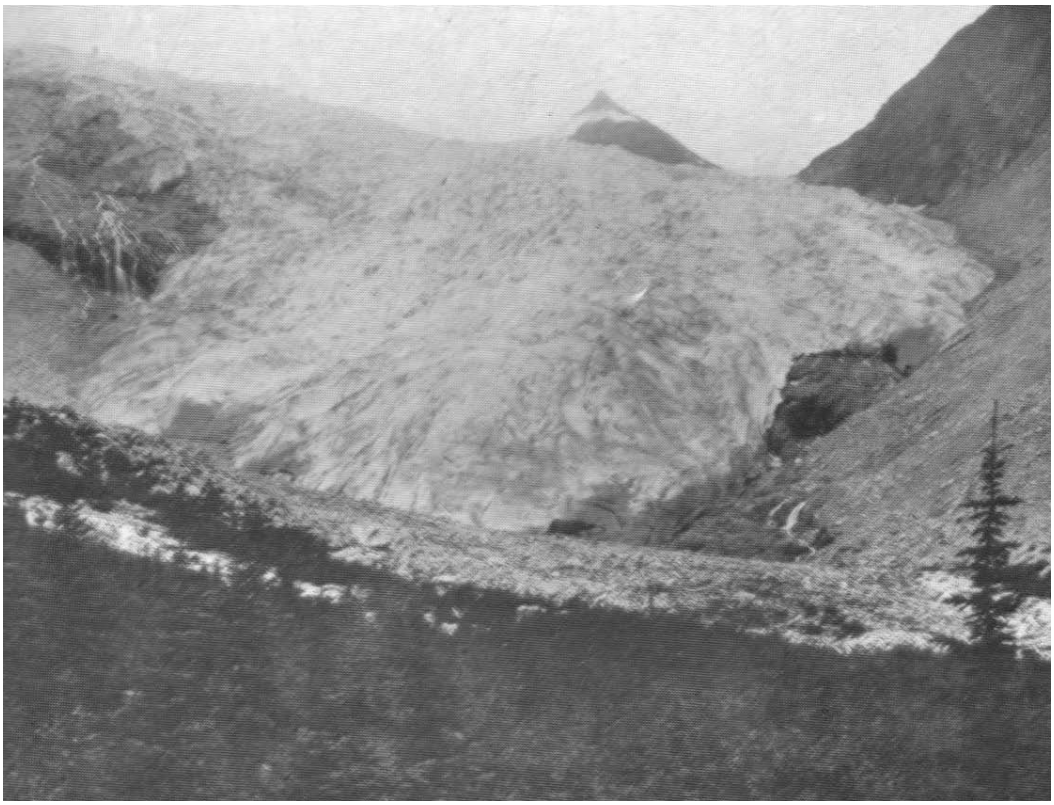
But one transit being available in 1906, the distances from the upper base-line ends to the plates were determined by means of a 12-foot stadia, the motions of the plates being of course measured with a steel tape. The very clear atmosphere made long sights satisfactory, but at times the vibration of the air, alternately cooled and warmed by the influence of the ice, made it necessary to wait a considerable time till this disturbance was removed.

Although a plotting of a map of the tongue and moraines of the glacier is a most important record of the conditions, but little need be mentioned here. The main points were determined by triangulation and the details sketched in with the aid of the transit and stadia. It may be noted that the conditions change most rapidly even within a few weeks. Streams break through, while others disappear; on the ice crevasses open and close and great walls of ice form where before there were level plains. The 1906 plates were laid out on comparatively easy surfaces. Twelve days later great crevasses had opened between them; one plate was totally lost and several of the others were found in almost inaccessible positions.

A continuous photographic record of the tongue of a glacier supplies one of the most accurate means of comparison known. While annual changes, unless very marked, can only be



Test Picture From Rock "W", 1899, Illecillewaet Glacier. Vaux, Photo.



Test Picture From Rock 'W", 1906, Illecillewaet Glacier. Vaux, Photo.

Yoho Glacier, Field, B.C. Note The Ice Arch And Seracs. Vaux, Photo

Wenkchemna Glacier, Alberta. The Glacier Is Encroaching On The Living Forest. Vaux, Photo.

determined after an interval of a number of years, the slight advance of crevasses and moraines may be distinctly seen, and after a term of say five or ten years, sweeping differences may be noted. On August 17, 1898, a large rock marked "W" on the map was selected from which the annual test picture might be made. Yearly from that time, at almost the same date, photographs have been made, using the same camera, lens, and as nearly as possible the same field of view. The trees in the foreground have grown, but the tongue of the glacier is still unobstructed, and a comparison of these pictures at intervals of three or four years proves conclusively the continued retreat and shrinkage of the whole mass. (Compare Plates 9 and 10.)

It would be wearisome to recount the similar work carried on on glaciers in the vicinity. The methods have been similar but varied to meet conditions.

The Asulkan Glacier, situated in the valley next to the Illecillewaet, receded since 1899, then advanced for a year, and the past summer (1906) was almost in the same position as in 1899. The summer rate of flow varies from 2.4 inches per day on the right side to 8.9 inches on the left. It bears large masses of moraine and appears to be more active than its sister in the adjoining valley. (Frontispiece.)

Further to the east, at the boundary-line between Alberta and British Columbia, the great Yoho Glacier at the head of the Yoho Valley offers many features, particularly a superb ice arch, often sixty feet high and broad, from which the Wapta River issues. (Plate II.)

The Victoria Glacier, above Lake Louise, is formed from the masses which avalanche from the upper slopes of Mt. Victoria and fall 2500 feet to the secondary glacier below. The slope is very slight and the surface is so covered with a layer of moraine that the ice is obscured. Here glacier tables and sand cones may often be seen, while the surface characteristics are very marked. (Plate I.)

In adjoining valleys the Wenkchemna and Horseshoe Glaciers are of marked interest. The former is of the piedmont type, being fed from a dozen smaller streams on the slopes of the Ten Peaks. This glacier exhibits unusual features in that it is probably advancing slightly and from year to year pushing its moraines over the living forest which surrounds it. If this is the case, it is the sole example of many scores of glaciers in the district which is advancing. (Plate 12.)

Descriptive details may be multiplied indefinitely, as no two glaciers exhibit the same characteristics. What has been said will, I trust, give a correct and pleasant idea of this great natural phenomenon, which if it has been successful will more than repay for this humble effort.

Structures In The Vicinity Of Rogers Pass.

By E. M. Burwash.

Any one who visits Rogers Pass and examines even cursorily the mountains which surround it, must be struck with the peculiarity which many of them possess, namely, a more or less perfectly pyramidal form. Mounts Sir Donald and Cheops will at once recur to the minds of those who have seen them as the most conspicuous examples. Mounts Avalanche and Macdonald are somewhat less striking instances. Mt. Hermit, viewed from the south, is a pyramid with its top missing. Another form characteristic of the locality is a long, somewhat sharp ridge, divided by transverse passes into separate peaks. As an instance of this, the ridge which includes Castor and Pollux, Afton and Dome and Mt. Abbott may be mentioned. Perhaps most impressive of all from its enormous mass and proximity to the railway is the great ridge which lies between the upper Illecillewaet and Beaver Valleys, bears on its shoulders the Illecillewaet Névé and forms the base

from which Sir Donald, Uto, Eagle, Avalanche, Macdonald, and other mountains rise.

The recurrence of similar forms suggests a similar origin and on examination it is not difficult to see that all the peaks above mentioned owe their common peculiarities of shape to a similarity of geological structure. They are in fact the remainders of two denuded synclinal troughs.

A brief explanation of this type of structure may not be out of place in a paper of this kind. As is well-known the elevation of mountain ridges is the result of pressure acting in a horizontal direction, which throws the surface layers of the planet, usually known as its "crust," into folds. To these the names of anticlinal and synclinal have been given, the former referring to arch-like forms and the latter to trough-like forms. By reference to the accompanying diagram (Fig. I), it will be seen that the upper rocks of an anticlinal must tend to be fractured and pulled apart by being bent over the rocks beneath them, much as a stick is broken by being bent around ones knee. They are thus rendered looser in texture and more readily attacked by rain, frost and running water. On the other hand the upper part of a synclinal, near the centre, must be compressed as the anticline is stretched, closing the joint-cracks of the rock so that they are not readily penetrated by water, and causing the minerals of which it is composed to re-crystalize, which renders it much more durable. Thus it comes about that the synclinal, which one would naturally think of as forming a valley, as in newly folded regions it often does, comes at length to form a ridge, which persists long after the more friable anticlinal arch beside it has been carried away piecemeal but completely, leaving a valley to mark its site.

The ridges thus formed are divided transversely by joints, which serve as lines of attack for the eroding agencies, which enlarge them into V-shaped ravines, and thus the ridge is carved into a series of separate peaks each of which exhibits more or less perfectly the typical pyramidal form.

Dr. G. M. Dawson describes the geological structure about Rogers Pass as follows: "The ..... great synclinal, which coincides with the highest part of the range, appears to have a transverse width of about thirteen miles ..... The position of the main axis of this synclinal nearly corresponds with Loop Creek, on the railway, to the west of Glacier Station, while a subordinate synclinal trough runs immediately to the east of the same station and nearly coincides with the actual watershed in the pass." The main syncline is shown by Dawson in his section (Fig. 2) as a closed fold, that is, one in which the folding has progressed until the two sides of the trough have come in contact with each other, and which would, therefore, show on the surface near the axis the upturned edges of vertical strata. The subordinate trough he represents as open, in which case one would expect to find horizontal strata at the axis, or centre-line of the trough. It is the subordinate syncline whose remaining part forms the Sir Donald Range and the eastern section of the Hermit Range. It is transversely divided by the deep valley of Bear Creek, which separates the two ranges between Mounts Macdonald and Tupper. On the cliffs of Mt. Macdonald, as seen from this valley, or from the Hermit Range, (Fig. 3) the trough-like curvature of the strata may be very readily observed. The same structure may be seen in Mt. Sir Donald on viewing it from the Illecillewaet Névé in the direction of Lookout Mountain, a straight line drawn on the accompanying map from Mt. Sir Donald to Mt. Hermit represents approximately the position of the axis. It will be seen that it is roughly parallel to the general direction of the mountain-system and to the valley of the Beaver River. It passes through Mounts Macdonald and Tupper and also through Mt. Shaughnessy to the north-west of Hermit. All of these mountains together with Uto, Eagle and Avalanche, which lie a little to the west of the line, may therefore be assigned to the same type of structure.

What appears to be the axis of the main synclinal is indicated by the line joining Castor

and Pollux with Ursus Minor. It passes through or near Mounts Castor and Pollux, Dome, Afton, Rampart, Abbott, Cheops and Ursus Minor, the first six of which form a continuous ridge. Ursus Major lies to the west of the axis and consists of tilted strata forming part of the western side of the trough, and exhibiting an interesting reversed curvature.

Of the mountains surrounding the pass, Rogers and Sifton are still unaccounted for. Neither of them lies upon a synclinal axis; they are on the contrary by a steep dip and curvature of the strata composing them easily recognized as belonging to the sides of the troughs. Mt. Rogers, viewed from the south (Fig. 4), shows very distinctly the curved dip of its strata towards the east, which flattens out to the horizontal in Mt. Hermit, on the axis of the syncline. Mt. Sifton is also a fragment of the anticlinal arch separating the two synclines, but the writer, in the absence of information as to the dip of the strata composing it, is unable to speak definitely as to which side of the anticlinal axis it lies. Its position, however, to the west of the anticlinal valley, would seem to indicate that it is part of the eastern edge of the western or main trough.

The reason why these portions of the folds away from the synclinal axis have proved so resistant is not quite as clear as in the case of peaks that lie in those axes. A suggestion may perhaps be drawn from the fact that the synclines themselves are not quite straight throughout their length, but curve horizontally toward the west as they extend northward. If the folding of the strata into troughs hardens the compressed upper part of those strata, so also the fact that a trough is itself bent must bring great compressive forces to bear upon the rocks forming that side of it towards which it is bent, that is, the concave side. The outer or convex side would also tend to be stretched and prove less resistant than the inner side.

The central point of the curvature of the strike of the syncline may be located somewhere near the valley of Bear Creek. A corresponding curvature in the valley of the Beaver River is noticeable at this point.

Mounts Rogers, Sifton and Grizzly may, therefore, represent those parts of the parallel synclines which have been subjected to squeezing owing to the horizontally curved shape which the structures have assumed in this neighborhood. The fact that they all lie to the west of the axis of the minor syncline may be cited in support of this view.

Equally interesting and of more practical importance are the valleys which have been excavated in this double syncline and its central subordinate anticline. As mountains represent the less easily eroded parts of the terrane, so valleys represent the more easily eroded. The short valley extending from Bear Creek to the Illecillewaet, in which the summit of the pass is situated, has already been mentioned as marking the position of the central subordinate anticline. The map shows that the valley of the Asulkan Brook and the Rogers Amphitheatre may be regarded as continuations of it at either end. The former does not appear to coincide with the anticlinal axis, however, but lies somewhat to the west of it.

The depth of this summit-valley, some six-thousand feet below the higher peaks surrounding it, suggests a more powerful erosive agency than the small brooks which now traverse it in opposite directions from the summit, and its continuity in size from end to end suggests that it was the work of a single stream which once flowed throughout its length, and not merely due to the lowering of the watershed between the present brooks.

If we can imagine the gorge between Mounts Macdonald and Tupper filled up, it is evident that the waters from what is now the upper part of Bear Creek, and from the central mass of the Hermit Range, would flow westward through the Illecillewaet Valley, and some considerations render it probable that this was once the case. If so, the greater amount of water flowing through

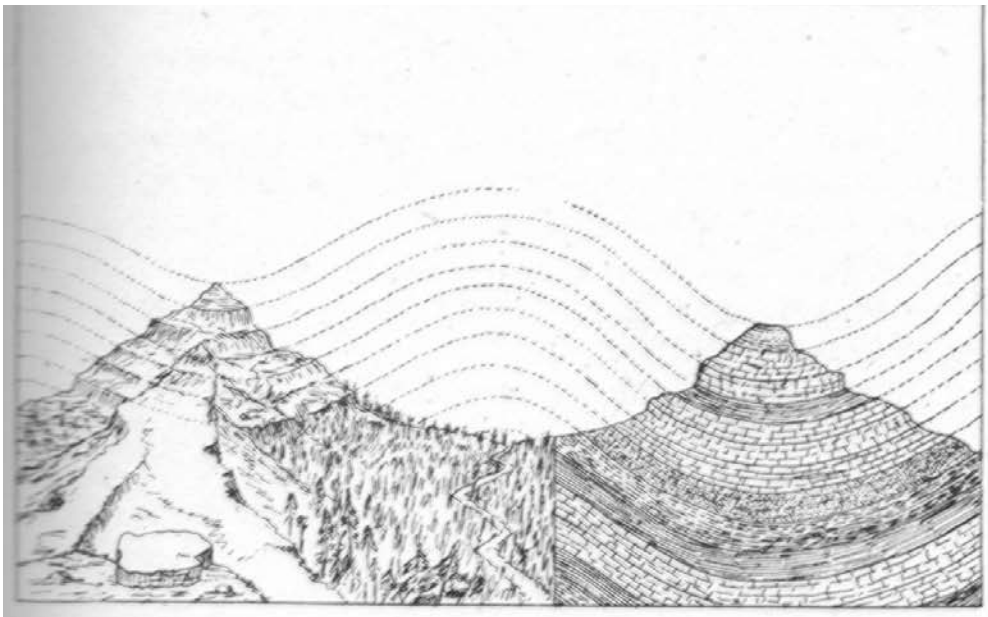


Fig. 1 - Diagram of two synclinal ridges with anticlinal valley between. E.M. Burwash, sketch.

One ridge shown in perspective, the other in cross-section.

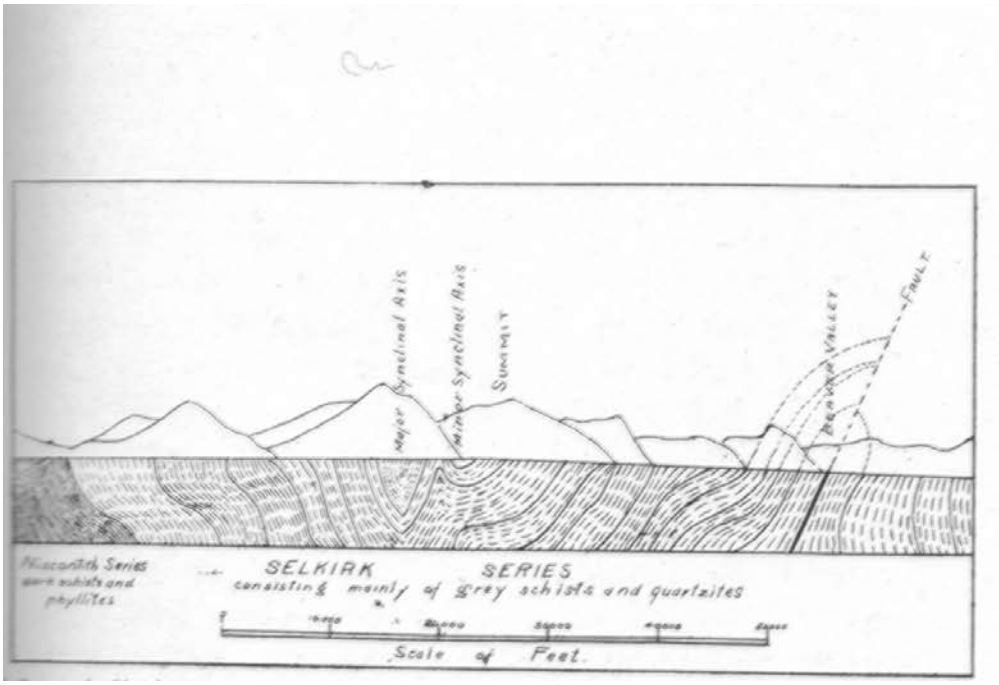


Fig. 2 - G.M. Dawson's section of great summit synclinal of the Selkirks. E.M. Burwash, sketch.

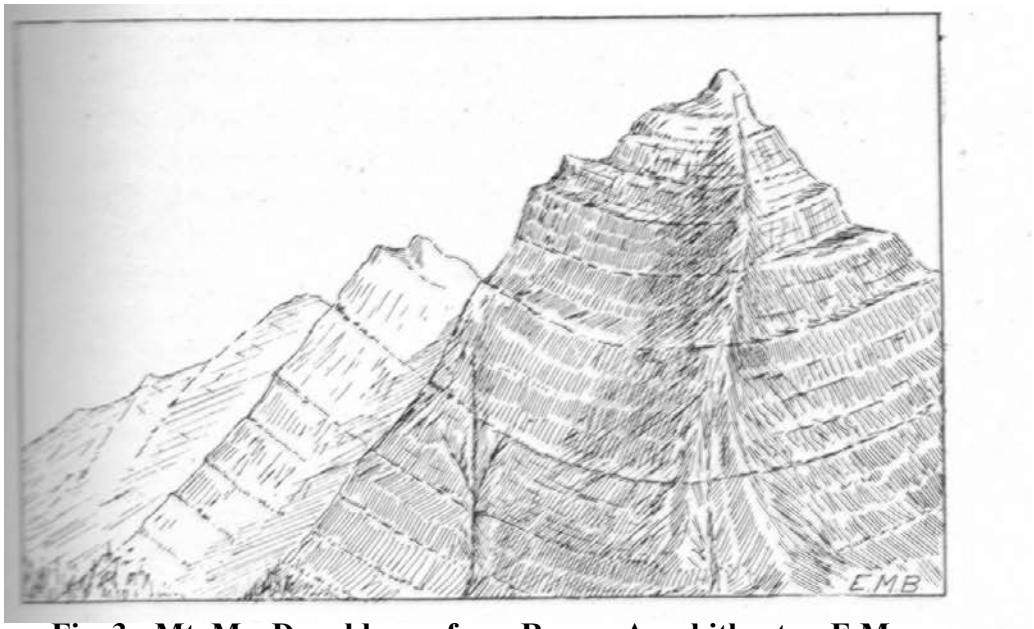


Fig. 3 - Mt. MacDonald seen from Rogers Amphitheatre. E.M. Burwash, sketch.

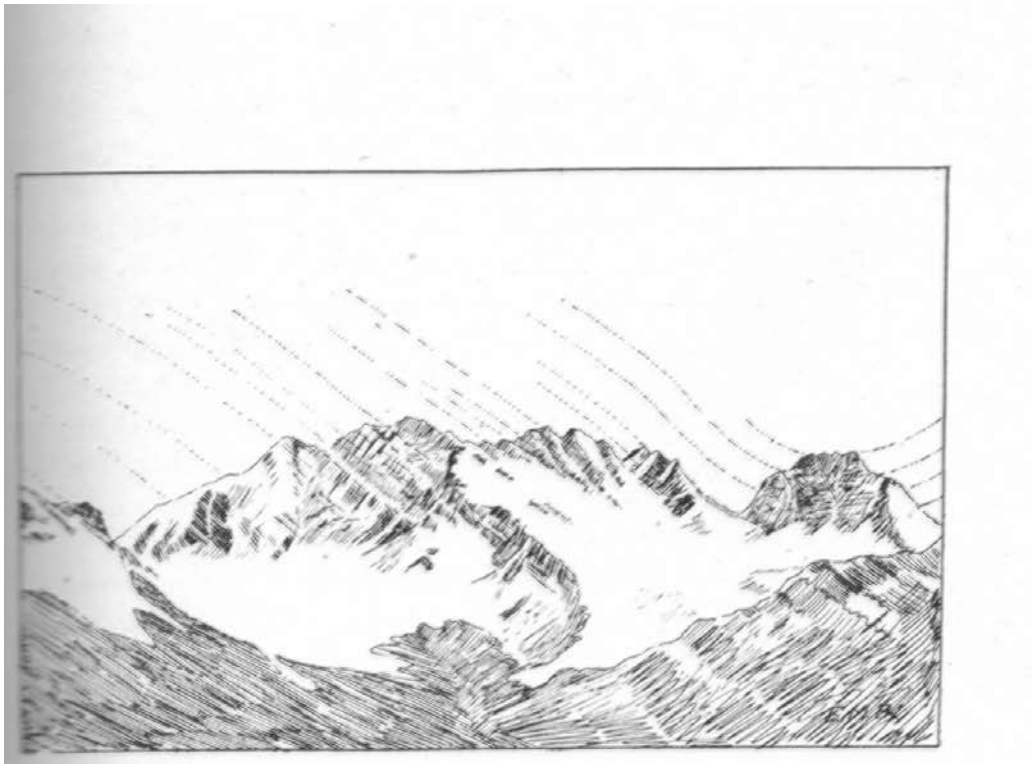


Fig. 4 - Mts. Rogers and Hermit. E.M. Burwash, sketch.
With stratification lines continued to illustrate structure.

Map of Sir Donald and Hermit Ranges. E.M. Burwash.

it would account for the deep and clean- cut nature of the summit valley. Bear Creek must then have been confined to the eastern slope of the Sir Donald Range, but being situated at the point where the curvature of the synclinal made its eastern side most easily eroded, and discharging into a valley much lower than the summit valley, it was able to extend its headwaters westward more rapidly than the other streams on the same slope, gradually lowering the watershed and finally drawing off to the Beaver River what were previously the headwaters of the Illecillewaet. It has now cut its bed across the summit valley at a point so far below its former level as to reverse the direction of flow for a short distance in this valley, has left the Rogers Amphitheatre, once the upper part of the summit valley, as a hanging valley high up on its northern slope, and has extended its headwaters to the heart of the main synclinal between Mounts Cheops and Ursus Major. The Illecillewaet, thus decapitated, continued to deepen its valley below the junction of the streams from the Vaux, Illecillewaet and Asulkan Glaciers so that the summit valley itself is now being left at a higher level, and presents the appearance of a hanging valley as seen from the bed of the Illecillewaet a short distance to the west of Glacier House.

That Bear Creek has invaded the territory of the Illecillewaet, and not the reverse, seems proved by the much fresher appearance of the gorge between Mounts Tupper and Macdonald, with its precipitous sides and hanging valleys, as compared with the upper Illecillewaet valley which has sides of much longer slope and tributary streams like Cougar and Loop Creeks whose valleys are cut down to the level of the Illecillewaet itself and are very deeply excavated for some distance above their confluence with the main stream.

Mountain Climbing For Women.

By Mary E. Crawford.

If for the sake of argument the question “Should women climb mountains?” were brought up it would be found exactly one hundred years behind the times.

In 1809 the first historical mountain ascent by a woman was made when Maria Paradis was taken to the summit of Mont Blanc by Jacques Balmat. Sad to say, her motive was not of a very high order, the excursion being made entirely for the mercenary one of personal gain. Neither can she be said to have “climbed” the mountain as she was literally “taken” by Balmat and hauled up like a sack of potatoes. “But,” she said, “thanks to the curiosity of the public I have made a very nice profit out of it, and that was what I reckoned on.”[3]

From this time on, the possibility of making ascents seems to have found favor in the eyes of the more adventurous women, until, to-day it is doubtful if any woman who has climbed over 10,000 feet could make one cent out of the erstwhile profitable public curiosity.

In 1834 a Bavarian Princess ascended the Mittaghorn, 10,328 feet. In 1838 Mile. Dangeville ascended Mont Blanc. In 1863 Mrs. Watson was one of the party which conquered Balfrin, 12,500 feet. In 1864 Miss Lucy Walker ascended the Balmhorn, 12,176 feet. In 1868 as recorded by Whymper in his “Scrambles in the Alps,” a young woman of the Val Tournanche arrived within 350 feet of the summit of the Matter-horn, the mountain being as yet unconquered. In 1870 Mrs. Brevoort stood on the summit of the Meije, 13,026 feet. And so on to the present day, when the names of Miss Peck, who so recently scaled Huascaran in the Andes, a peak over 24,000 feet high; of Mrs. Bullock Workman, who with her husband has made first ascents of the giants in the

3 M. Duriers « Le Mont Blanc.»

Himalayas; and of Miss Benham, with about 200 ascents to her credit, prove that women also are making history in the alpine world.

Ordinarily, the idea of mountaineering as a recreation only occurs to those who live in the vicinity of mountains or whose business takes them there, or in whose family the love of mountaineering is inherited. But now that alpine clubs exist which admit women to membership, and which, by assuming all responsibility of equipment at a reasonable rate, place the mountain summits within reach of all, there is no reason why every woman may not seriously ask herself "Why should I not spend my holiday this year in the mountains?"

There is no recreation which, in all its aspects of surrounding and exercise, will bring about a quicker rejuvenation of worn out nerves, tired brains and flabby muscles than mountaineering. It is for women one of the new things under the sun and every fresh mountain is a new delight. Ennui has no place in the vocabulary of the woman who climbs, the words which rout it are enthusiasm and exhilaration. Diseases of the imagination cannot be discovered anywhere on a mountain side, where Nature asserts herself so grandly to the consciousness and with such insistence that the "ego" with its troubles sinks out of sight.

In the actual climbing the whole attention is so absolutely concentrated on the business in hand that every worry is put to flight and nothing is of any moment beyond reaching the top of the mountain. The therapeutic value of this one feature alone is inestimable.

Take the woman whose usual occupation is a sedentary one—whose daily life is one of routine in the office, the school-room, the sick-room; and who is constantly giving out to others her nervous energy. Put her on the train and send her to the mountains. The imperfect glimpses of this peak and that gorge are small foretastes of what she is going to enjoy, for no one knows the mountains who sees them only from the car window. Now she has reached her destination and is left to exchange for the rattle of the train the music of rushing torrents, to breathe in the keen pure air which finds its way to the very last air-cell of her lungs, and to rest her tired eyes on beauties of form and color never before imagined. Every influence by which she is surrounded is alterative in its effect.

She spends a night under canvas and feels the first pangs of healthful hunger to which she has long been a stranger. And now—suitably dressed, and with feelings of excitement and wonder—she waits with her party of guides and companions the word which starts her off on her first mountain ascent. Nervous about the new experiences to come? Perhaps—for the almost invariable reply given by the woman to whom is presented the new idea of mountain climbing for herself, is—"Oh! I never could climb for I am always dizzy when at a height—I cannot look down—I should be afraid." But there are guides, men of experience, whom she has only to obey, and who will show her the right thing to do; there is the rope, tested and strong; and she has her alpenstock and her nailed boots whose efficiency against slips she has already experienced. She knows that every precaution against danger is provided and perhaps remembers Mrs. Jellybys remark that "You may go into Holborn without precaution and be run over; you may go into Holborn with precaution and never be run over. Just so with"—the mountains, to change the quotation. Then there is the company of former novices who also had always been dizzy at heights, but who now ascend their peaks without a qualm and with confidence.

There is another factor which she has not taken into account, but which comes to her as surely as there is a cliff to climb or a torrent to pass, and that is the infallible instinct of self-preservation. She is going to know herself as never before—physically, mentally, emotionally. And so she starts out, gains confidence with every step, finds the dangers she has imagined far greater

than those she encounters and arrives at last upon the summit to gaze out upon a new world. Surely not the same old earth she has seen all her life? Yes— but looked at from on top—a point of view which now makes upon her mind its indelible impression.

This woman returns to her round of daily duties in the workaday world—but she has only to close her eyes for a second and she is transported to her mountain top. Brain fag? Nervous exhaustion? Asthenic muscles? They have lost their dread meaning. Time cannot drag now, for to the mountaineer "the year passes quickly looking back and looking forward."

Not many books on athletic sports for women—if there are any—devote a chapter to mountain climbing; perhaps because the idea is a new one, or perhaps because it is only a short time in the year that can be given to it by the average woman, while other forms of physical exercise can be practised more continuously. Beyond presenting the idea, however, books cannot do much to teach the "knack"—it can only come by experience. Preparation for the climb can be made by following these more every-day exercises and, viewed in this light, they take on a fresh interest. The daily physical drill has an object now, and every long walk leads to the mountains. Rowing with the sliding seat has been recommended as the best exercise for training for mountaineering—but for those to whom this is out of the question the Japanese method of individual muscle training is excellent; and walking every day and in all weathers, with perhaps a pedometer to add zest, is best of all. Many women take no previous training beyond this. Mrs. Bullock Workman who, as she says of herself, is not a light weight, made ascents of over 16,000 feet in the Himalayas without any, and her highest and hardest work was accomplished in the low levels and moist atmosphere of Ceylon and Java. She recommends for those who wish to reach the higher peaks, a previous residence of a few weeks at 11,000 feet.

The ambition of the average woman, however, will not lead her beyond the more easily obtainable ascents, and she can almost disregard any fears of the effects of high altitudes. Mountain sickness does not usually attack its victims under 12,000 feet, and many attain far greater heights than this without any untoward sensations. Climbing is for the stout woman as well as the thin, and while it is the rule to lose weight during the period of making mountain expeditions, the normal equilibrium is soon gained. Stout and thin alike find themselves in much better proportion than before.

Any woman who contemplates this form of recreation, and who has any fears as to her physical ability, should be properly examined first. Should she be below the average, however, she has only to think of Switzerland—the Mecca of the invalid, among whose heights are to be found sufferers from diseases of every system of the body—circulatory—respiratory—nervous. These find in that wonderful air and beautiful environment their restoration to a large degree and, knowing that our Canadian mountains possess the same power, she can confidently expect like results.

The following data of physical characteristics and personal experience have been gathered from nine women who have made more than two ascents of over 10,000 feet. These follow their daily occupation at sea-level and in the prairie provinces, and include teachers, nurses, housekeepers, stenographers.

(a) Height ranges from 5 feet to 5 feet 9 inches.

(b) Weight ranges from 98 lb. to 140 lb.

(c) State of appetite while climbing—in all cases never falls below very good.

(d) Ability to sleep between climbs—very good except in two cases, these being influenced by temperament.

Lookout Point. Don Forrester, Photo.

Crossing Bear Creek.

(e) Temperament—classification of: Energetic or Indolent, Excitable or Deliberate—while none acknowledge to indolence, every variation under the other heads is given, from highly strung and extremely excitable to very calm and deliberate. Dizziness at heights was felt in two cases on first climb but not subsequently. All unite in asserting the beneficial effects experienced.

The following are extracts made from general remarks in the list of questions sent out. "Mountain climbing is a splendid cure for nervousness."

"From various climbs during five summers I believe that any woman with fairly sound organs can do mountain climbing with very great benefit to body and mind. I am convinced that making a fairly dangerous climb, where every sense must be alert and cool, makes a woman more fearless in attempting difficult tasks in her ordinary life. The ideas gained of the beautiful and sublime cannot be valued."

"In my experience I have found, that when tired, there is a mental exhilaration which supplies new energy; and in time any feeling of fatigue departs so as to allow of finishing the trip with no ill effects whatever."

"I lost weight during the week of climbing, but never felt better in my life."

And so the woman goes back to her tasks revivified. For the teacher new lights have been thrown upon history, literature, geography or mathematics. The artist and writer have found a mighty inspiration. The student of natural history has fresh specimens to classify. The nurse need not rack her tired brain for material to while away the heavy hours of pain for her patient—she has a fund of thrilling and amusing anecdotes to give out of her own experiences.

There is a field of interest in the mountains to satisfy every branch of mental enquiry. And for the body? When the mountaineers friends one and all greet her with the exclamation "How well you are looking, I never saw you looking better in your life!" she knows that she is the happy possessor of the beauty of health gained from her sojourn among the heights.

Observations Of Glaciers.

By Harry Fielding Reid.

The active explorations which the members of the Canadian Alpine Club are carrying on in the little known regions of the Canadian Rockies and Selkirks give them an opportunity of collecting important observations bearing on the conditions of the glaciers. I fully realize that the charms of mountain climbing require no special inducements, and, to change an old adage, that climbing is its own reward; but the addition of a specific object to the general pleasures of mountaineering will add much to the interest of a summers outing. The establishment of a Scientific Section in the Canadian Alpine Journal indicates an interest in scientific matters on the part of its members which will certainly lead to the collection of important information regarding the condition of the glaciers. The extension of the glaciers is continually varying and therefore observations which may be made in the future will not take the place of those which might be made now. All kinds of observations could be made, from those of a casual character to carefully conducted experimental studies, such as those of the Messrs. Vaux, Professor Sherzer, and of Mr. Wheeler; but those which can be most easily made by exploring and climbing parties are observations on the changes in size which the glaciers are undergoing.

The different parts of a glacier are not independent, but are closely related to each other. In glaciers which are not varying in size the annual accumulation of snow in the reservoir above the névé-line, equals the annual melting of the ice in the dissipator below it; and these are each equal

to the ice flowing through a section across the glacier at the névé-line. Anything which throws this general relation out of adjustment will produce variations in the size of the glacier, but the changes may not become evident until some time later. For instance, a number of years of increased snow-fall will cause a more rapid flow of ice into the dissipator, and the greater velocity thus acquired will carry the ice a greater distance before it is entirely melted; but the advance of the end may not occur for many years after the increased snow-fall. On the other hand a great increase in the rate of melting may produce an immediate retreat of the end of the ice. Although much study has been given to this aspect of the subject, a detailed relation between climatic changes and the size of the glaciers has not yet been fully worked out, and observations are of great importance.

An increased snow-fall will be followed immediately by a lowering of the névé-line and vice-versa; and observations on this point would indicate before hand a future advance or retreat. There are two ways in which such observations can be very easily made; by simply determining the altitude of the névé-line with an aneroid, or by means of the very excellent maps which the President of the Club and his able assistants of the Dominion Survey have made of many Canadian glaciers. A photograph of the névé-lint, showing its relation to the surrounding topography, could also be used to determine the changes by comparison with photographs taken in previous and future years. These observations should be made as late as possible in the summer in order that the position of the névé-line may be determined after all of the summers melting has taken place. There are general methods of determining the average height of the névé-line, and these special observations would determine its variations.

Observations on the conditions of the ends of glaciers will reveal directly the advance and retreat. There are many ways by which the position of the end can be determined; the simplest is by measuring the distance of the ice from a boulder; which can be marked or which can be recognized from its size and shape. The objection to this method is that the end of the glacier varies so much in shape that the changes of the point opposite the boulder may not represent the true variations ; and, besides, the ice may advance over the boulder and the point of reference be lost. Another very simple way is to select two points, A and B (figure i) on opposite sides of the valley, a little below the end of the ice, and then measure the distance of the ice from the line connecting them. These points should, of course, be marked, or should have such special characteristics that they can be recovered. A map can easily be constructed of the glaciers end by measuring the perpendicular distance of a number of points at the end of the ice from the line A B.

A third method, also very simple, can be carried out with a compass. Select two stations, as in the last method, except that they might with advantage be at a greater height above the valley floor; and from each station take compass bearings on the other and on various points at the end of the ice. These bearings can then be plotted on a sheet and a map of the glacier made. It is necessary to know the distance between the stations; this may be determined by auxiliary compass triangulation from a measured base; or may be estimated, of course, with a less degree of accuracy. Instead of using a compass a small plane-table could be used with a distinctly higher degree of accuracy. A small board 10 to 12 inches can be fitted upon a camera tripod, and with a small peep-sight alidade a very fair survey of the end of the glacier can be made from two or more stations. This would require a very little additional weight to be carried and would yield very interesting results.

Perhaps the simplest method to be used in the field is by photography. A single photograph showing the relation of the end of a glacier to the surrounding topography is useful, and will indicate, in conjunction with future photographs, even when not taken from the same spot, whether the glacier

is retreating or advancing; but it will not give quantitative values. Two or more photographs, however, taken from the stations A and B, with a few auxiliary bearings, will enable a fairly accurate map of the end of the glacier to be made by the methods of photographic surveying. The additional observations that are needed are: the distance apart of the two stations, and bearings from each station on the other and on two points in each photograph. These bearings could be obtained with a compass or by means of a simple plane-table. It will frequently happen that persons are in the neighborhood of a glacier without the skill or without the means of determining the distance between the stations and the bearings required, but this should not deter them from making their photographs. Let them select two stations, placed somewhat as A and B in the figure, and so situated as to give good views of the end of the ice; and let them take photographs from each station. The stations should be described or marked so that they may be recovered in the future. These photographs will be quite valuable, for some future expedition to the same region may determine the proper bearings, and then the earlier photographs could be used to plot in the end of the glacier at the time they were taken. Any ordinary camera can be used, but one precaution should be taken, namely, to hold the camera level when taking the picture; a small circular level attached to the camera is very useful for this purpose. The determination as to whether a glacier is advancing or retreating by the simple examination of its end is not always satisfactory, but occasionally definite results may be obtained. The slope at the surface of the ice of an advancing glacier is usually fairly steep, and that of a retreating glacier fairly gentle. Sometimes an advancing glacier is invading a forest or advancing among bushes or overturning stones; these symptoms are, of course, unmistakable. A retreating glacier usually has a broad area in front of it upon which plant life has not taken hold, and sometimes the appearance of the ground immediately in front of the ice shows that it has very recently been uncovered; sometimes detached masses of ice protected by moraine material, or recently deposited moraines are found in front of the glacier, giving a certain indication of retreat.

It is not only important that observations should be made, but it is equally important that they should be recorded; and I therefore recommend that a special committee of the Canadian Alpine Club be appointed to take charge of this information, and to publish an annual report in this Journal. Copies of photographs, with the accompanying data, and all observations which may be made on the conditions of the glaciers, should be deposited with the committee. There is an International Commission which publishes annually a general account of the variations of glaciers in all parts of the world. This commission was appointed by the International Congress of Geologists at Zurich in 1894 and reports regularly to the Congress, which meets every three or four years. Mr. Douglas W. Freshfield represents Great Britain and its colonies on the commission, which would be very glad to receive more information regarding the variations of the Canadian glaciers.

Motion Of The Yoho Glacier.

By A. O. Wheeler.

At the close of the Clubs observations of the Yoho Glacier on July 17th, 1907, a row of metal plates was, for the second time, set out across the ice forefoot, at relatively the same position as in 1906, and their relation to the base A-B[4] obtained by angular readings.

4 See map of ice forefoot in 1908 issue of the Canadian Alpine Journal (Vol. 1, No. 2, opp. page 274).

On July 1st, 1908, the glacier was visited and observations made similar to those of the two previous years. The results are set forth in the accompanying tables.

To Obtain Rate of Flow.

Angles were read from the respective ends of the base A-B upon the plates in the new positions in which they were found. None were missing. The computed results are as follows:—

Table Showing the Motion of Plates Set on the Yoho Glacier.

Plate	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Movement between July 15th, 1906, and July17th, 1907						
Yearly Motion	29ft.	74ft.	89ft.	124 ft.	134 ft.	124 ft.
Daily Motion	0.95 in.	2.43 in.	2.93 in.	4.08 in.	4.41 in.	4.08 in.
Movement between July 17th, 1907, and July 1st, 1908						
Yearly Motion	20ft.	43 ft.	112 ft.	115ft.	127 ft.	127 ft.
Daily Motion	0.69 in.	1.48 in.	3.85 in.	3.95 in.	4.37 in.	4.37 in.

On comparing the tabulated results, a slight decrease will be found in the movement of all the plates excepting No. 3 and No. 6. In the case of No. 3, it will be remembered by those who have read the 1908 Journal that on July 17th, 1907, this plate was found lying in a shallow crevasse, and, on that account, the motion may have been retarded, or the plate thrown backward at the time the crack opened.

Plate No. 6 was set 84 feet nearer the base A—B than the previous year. It would thus be closer to the greatest volume of the ice, the point of highest specific gravity, and the increased movement be accounted for.

Taken as a whole, the observations for the two years give satisfactory comparative results over the part of the ice forefoot where the greatest volume is located. In conjunction with other observations and measurements, the results point to a diminution of the volume of the ice, and a consequent retreat of the forefoot.

For Advance or Retreat.

Measurements were taken, as in previous years, from rocks Nos. 1 and 2, and from the Sherzer Rock to the nearest ice. The results for the several years are as follows:—

Table Showing Measurements to Nearest Ice.

Year	From Rock No. 1 Left Side of Stream	From Rock No. 2 Left Side of Stream	From Sherzers Rock Right Side of Stream
1904	—	—	79.4 ft.
1906	27.5 ft.	36.6 ft.	79.6 ft.
1907	35.8 ft.	43.8 ft.	123.0 ft.
1908	72.3 ft.	104.4 ft.	138.5 ft.
Distance from Rock No. 1 to Rock No. 2 = 53 ft.			

The measurements show a slow but steady retreat all along the line, although, owing to the change in shape of the front, the differences in the measurements are not uniform. The maximum for the three years, 70.8 ft., is at Rock No. 2. Here a spur of ice has broken off and melted, giving a snub-nosed appearance, where formerly a tentacle reached out. On the right side of the Yoho River, the recession seems to have been about one-third of that for the previous year.

Annual Changes in Formation of Ice Forefoot.

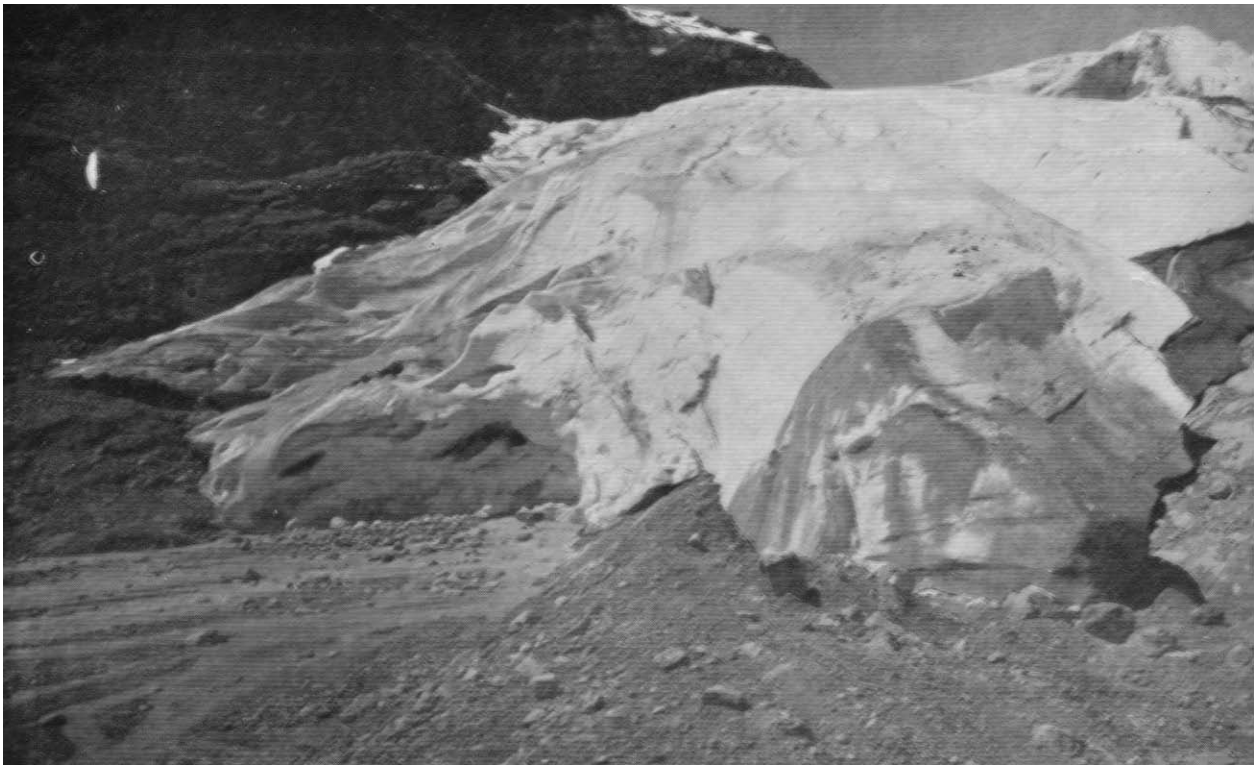
Photographs were again taken from view-point 79.3 feet south of Rock No. 1, from view-point 6½ feet nearer the ice than the Vaux marks of 1902, and from Rock No. 2. (See illustrations Nos. 1, 2 and 3.)

Comparison of these will the illustrations given in the 1908 issue of the Journal (Vol. I, No. 2; opp. page 274) will show a very marked recession of the ice.

Illustrations Nos. 3 and 4 show the photographs taken from Rock No. 2 for the years 1908 and 1906 with the same camera. The change in the two years is here very marked, particularly the uncovering of the floor of the valley near the edge of the stream. These two photographs illustrate very forcibly the diminution of the volume of the forefoot. The change is noticeable in the greater extent of cliff visible above the ice at sky-line. They point not only to a recession, but to a large decrease in the thickness of the glacier near its end.

The observations and measurements will be again made during the summer, and, in view of the heavy snowfall last winter and the late spring, the results will be of much interest.

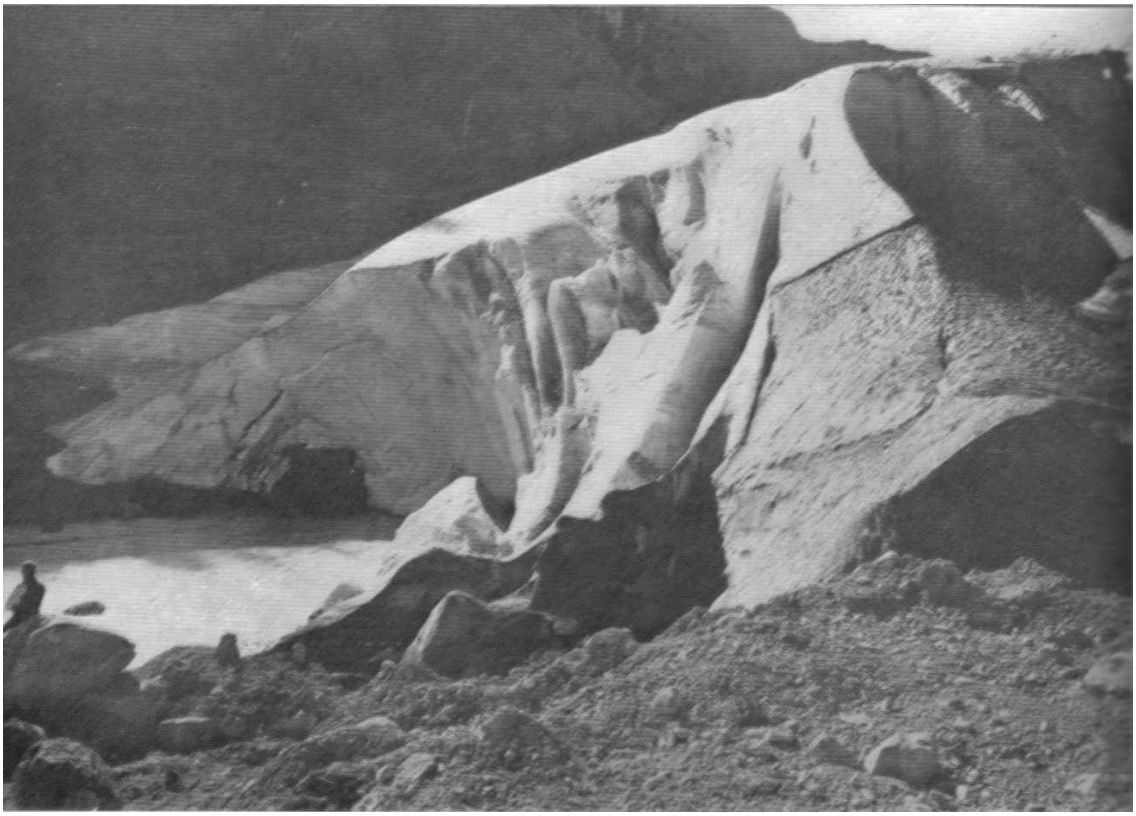
Showing Baseline For Survey Of Forefoot Of Glacier.



From Viewpoint 79.3 Feet South Of Rock No. 1-1908. A.O. Wheeler, Photo.

From Viewpoint 6 1/2 Feet Nearer Ice Than The Vaux Marks Of 1902-1908. A.O. Wheeler, Photo.

From Rock No. 2-1908. A.O. Wheeler, Photo.



From Rock No. 2-1906. A.O. Wheeler, Photo.

BOTANICAL NOTES.

Our Alpine Flora.

By B. R. Atkins.

It is a pretty general fallacy that the Tropics boast the most beautiful flora, and that, to see superb sights of floral coloring, one must of necessity go to equatorial countries for the purpose. Such, really, is not the case. Of course, there are some truly magnificent flowers there, as the Epiphytal Orchids, Poincianas, Lagerstraemias, etc., but their grand coloring is lessened by their general infrequency in the green, ever-green setting of an almost impenetrable jungle, where nearly every plant is tree-like.

Strange as it may appear, the coldest flora is, humanly, the most beautiful; and close up to snow-line is the true home of floral beauty, both in instance and mass of coloring; and this strange fact, so easily demonstrable, is just as easily explained. It would take up too much space to tell the whole story of how plants came to be, and how, first, of one great family, they separated and divided into many and various ones. We must accept something for spaces sake, and we can begin with the basal fact that plants live, and that their life aims are food and perpetuation. The different shapes and colors we see are means to these ends. In a word, it is adaptation; and that means survival. Primarily yellow, simple and regular, they advanced according to necessity into white, red, blue, purple and variegated colors; and from simple, open disks, to bells and sacks and cornucopias. This with the purpose of attracting their insect visitors and rewarding them with the nectar kept for them alone. But, wanting some return for this display of charm and jealous provision of sweet reward, they secure their fertilization by elaborated methods of mechanism which excite our scientific admiration and wonder. The simpler plants attract attention and secure fertilization by brilliant coloring, as our water-lilies, poppies, mallows, etc., while higher plants dispense with it, as the sage, mint, etc., for more complex but scientific means of pollination. This progression means variation, and that, different families; yet even in the members of one family, as the parent buttercup, progression may be seen in its children, the columbine, larkspur and monkshood, all, in adaptation to their special circumstances, ahead of their comely, simple mother.

In the Tropics, where there are no truly deciduous trees, no long winter rest, no spring contrast of resurrection, where the struggle for light and air and attraction, for life indeed, is fierce, sustained, and deadly, we find this adaptation most and color, consequently, least conspicuous. In the colder countries, where there is air to breathe for all the flowering host, and room to dwell and joyfully inhabit the earth, fertilizing mechanism has not gone so far but that beauty and loveliness have outrun it, and gone further. For true beauty of form, glory of color, and wealth of bloom, all displayed to grandest advantage in the sublimest of Natures own setting (and she is no tyro in art, but its very mother), the lover of things lovely can better view it at home in the mountain meadows amid the everlasting hills of his own Rocky and Selkirk Mountains, than in the heavy and interminable jungles of some distant torrid clime.

Though mountain flowers are so beautiful, and though some reason for it has been shown, there is still another but allied cause not quite as patent to the mind as the fact is to the eye. In a word, it is because of the barometer. In our lowland homes the bee is the patron of the plants, and for him our lowland blossoms display their most alluring attractions and ingenious devices. Being, however, a busy and honestly industrious fellow, with no time to lose, the flowers he visits cater with eagerness to his purpose, and endeavor to catch his attention in a minimum of time.

In keeping with his habits and sphere, our bee is a solid little chap, with a heavy body and small wings; and, because of the rarified air of the mountain heights where he cannot support his sturdy weight, he ceases to soar, and confines himself to more canny and commonplace ways where business is business. And the flowers, perforce, I think, recognize it.

In the sub-glacial space and sphere the butterfly reigns as lord, with a goodly and brilliant train of retinue after his kind. No busy, working, profit-making creature he, but a gay Adonis of his winged tribe, sipping nectar where he may be most attracted and disposed, and displaying his charms in all the gaiety of idleness. No plain, bell-spikes for him, but brilliant, showy, compact honey, easily gathered, and plenty of it. His motto, "A short life and a merry one," and seeing it is really so very short, how should it be other than merry. Adaptable and amiable in both spheres, highland and lowland, the flowers represent the characters of their winged admirers, and hence their differences of aspect, coloration and organization to our human view. There are other causes of difference, to be sure, which might be looked at with interest, but as our subject is Alpine Flora, description of some of its characteristics will explain them for us.

Ages and ages ago, the geologists will tell when, the earth as far south as, say, London, New York and Montreal, was covered with ice. Nothing had survived the cruel cold, and life was extinct in the great glacial grave where now we live in generous sunlight. In course of time, in the fullness of things, the old ice order changed, and, warmer weather setting in, plants and animals of sub-glacial regions, fulfilling their simple mission, followed the retreating ice-cap northward and upward. As time went on the plains got too hot to hold them, and they remained only on the high mountains, or close to the limit of northern snow. In this way isolated ranges in either continent have each their own little colony of Arctic or glacial plants and animals, surviving by themselves, unaffected by intercourse with their unknown fellows elsewhere. This explains the noted resemblance of species and characteristics common in most alpine flora, and in the Arctic circles of Europe and America also. Of course, the traveller in the European Alps will see a difference here in the species of our mountain flora, but the family and generic connection of our Anemones and Avens, Buttercups and Butterworts, Campion and Cranberry, Gentian, Heath, Wintergreen and Vetch, is close and clear, and tells us why at such long distances they reappear (in suitable conditions) following receding summer snow-lines and frontiers northwards. They are of an ancestry as old as the ice-age, and as pure in descent as ancient. They are simple, freedom-loving plants, loving their mountains and northern homes with a tenacity of purpose which spells life to themselves and beauty to the hills they adorn. No exotics or mixed breeds they, but beautiful examples of the simple life and hardy specimens of a vigorous clime.

The tenacity and vigor of an Alpine flora is splendidly seen in the progress of a mountain ascent. Leaving the fields of flowers—Arnicas, Asters, Castillejas, Erigerons, and other genera—we find them ever growing smaller as higher we go, till, at last, tall trees, so called, trail off into mere straggling and distorted bushes. Here, where we might reasonably expect to find no thing of beauty, we find Drabas and Oxytropis, and, growing flat on the ground, with hardly a stem to them, the Moss-Campion and Mountain Saxifrage. This diminution is the result of wind and cold; and because of the warmer air and more shelter near the ground, the plants lie close and produce their buds there. Thus, at snow line, and very far north, vegetation runs low and stunted, taking cover in every crack and cranny, and in every sunny nook for protective shelter and warming growth. For centuries they have been accustoming themselves to such strenuous surroundings, and well adorn the lofty stage they occupy. Low, rosette-shaped and compact, they offer a symmetry of form and cumulative habit dear to the florists heart, and one which he artificially loves to encourage and

Rocky Mountain Flora From Lowest To Highest Altitude. R.R. Copeland, Photo.

produce amongst the reedier, if higher specialized, products of his plains.

Few, very few, plants are "careless of their neighborhood," but are found in a place appropriate to them, and they to it. Conspicuous in their faithfulness are the glorious but simple beauties of our Alpine flora, and if in our ascent we climb the mountain top "where biting cold would never let grass grow," we shall, even there, find its silver and sulphur lichens, reminding us, as it were, of the small pleasures which gladden even the saddest human lot, and, in the moral, find heart for further effort to be worthy of our place and walk in life.

MISCELLANEOUS SECTION.

A Note On Tyndalls Alpine Books.

By Elizabeth Parker.

In the second chapter of his mountaineering classic, "The Playground of Europe," the late Sir Leslie Stephen has this word to which every member of the Alpine Club of Canada will assent: "My readers—for I assume that my readers are mountain-lovers—will agree that the love of mountains is intimately connected with all that is noblest in human nature." It is the parenthesis that I would emphasize. Those persons who have voluntarily lived, even for one short holiday, in an alpine region, wandering here and there by valley and pass or climbing to more lofty elevations, are ever after interested in alpine books, and it is mainly for them that the mountaineer records his experiences and describes his visions in rare altitudes—for them and for the growing number of high climbers. There are those, it is true, who may make love to the mountains and who by vice of such love-making are without the circle of genuine mountain-lovers. Their mark is sentimentalism; their writing is not alpine and it is not literature.

Happily for the eager increasing number who climb mountains the world over there is, in our language at least, a very considerable alpine literature of high rank. These Canadian Alps, beginning but twenty years ago to be climbed, have inspired more than half a dozen volumes in modern mountaineering, any one of which would provide matter for an article in this journal. Their place is assured in Rocky Mountain history. As far as I know they are: "Camps in the Rockies," by Sir W. A. Baillie-Grohman; "Among the Selkirk Glaciers," by W. Spotswood Green; "The Rockies of Canada," by W. D. Wilcox; "The Selkirk Range," by A. O. Wheeler; "Climbs and Explorations in the Canadian Rockies," by J. Norman Collie and Hugh E. M. Stutfield; "In the Heart of the Rockies," by James Outram; "Glaciers of the Canadian Rockies and Selkirks," by William Hittell Sherzer; "Mountain Wild Flowers of Canada," by Julia W. Henshaw; "Alpine Flora of the Canadian Rocky Mountains," by Stewardson-Brown and Mrs. Chas. Schaffer. This does not exhaust the modern list and there is also a very valuable literature now gone into the catalogue of "rare books." A good many of these have been secured for the Clubs library. Among those wanted is Pallisers Journal. The hint is given gratuitously, and in passing, it may interest some to know that in the list given above, four of the authors are honorary members of the Canadian Alpine Club, one is its President and two are ordinary members.

I propose to call attention to Tyndalls "Glaciers of the Alps" and "Mountaineering in 1861," republished together in Everymans Library. Part of the first volume is omitted to make room for the second, but it can be bought for about thirty-five cents in a well-bound volume printed in clear type by Routledge. I thought first of choosing Sir Leslie Stephens book; and then in Scots

phrase, I "swithered atween the twa," finally deciding on Tyndall. Nevertheless, "The Playground of Europe" is the most charming alpine book that has ever come my way; and, taking them all in all, mountaineering books are marked by those literary qualities required to grip the reader in the beginning and hold him thrall to the end.

It was by these mountaineering records that Sir Leslie first made fame as a writer. This may be news to many as it was to me who had read several of his biographies and his "Hours in a Library" before ever hearing of "The Playground of Europe." And when I heard, I sent to London for it. It is neither scientific nor learned. You may learn much of a practical sort from it about climbing in the Alps, so minutely and so graphically does he record every round excursion. And he is so delightfully discursive, it is easy to understand how Stephens friends were so fond of him, for "The Playground of Europe" tells mountaineering tales to which you can return again and again, they are told so wonderfully well. He seems to take riotous delight in the difficulties and yields himself with abandon to alpine beauty, though there is a certain fine reserve in his descriptive writing. Nevertheless, there is a winning, escapable personal element, revealing the writers kinship with mountain scenery. Again, humanity bears a part in the book with bits of genial humour and—and persiflage. He has the gayest contempt for his own compatriots known in the catalogue as "cockneys." Altogether, "The Playground of Europe" is a very striking and original alpine book, and when it appeared, must have taken its fit audience by storm.

Tyndalls "Glaciers of the Alps" is a different book, but it is quite as interesting as the other. It is scientific, but not too scientific, being written in terms of the people. "The lave," of whom I am one, can read it with interest, all unconsciously absorbing useful knowledge. He is never ponderous, his science does not bore the layman; while he is intent on scientific observation and while he records every detail of glacier study, of ascent or descent on a given mountain, nothing of beauty in natural phenomena escapes his eager eyes. Were there space, I could quote copiously to prove this. There are very exciting places, for Tyndall was a venturesome climber—too venturesome. His precepts are all right, however. How gravely he warns his readers against such exploits of his own as climbing Monte Rosa alone. His first ascent of that great mountain (15,284 ft.) was in company with one Swiss guide who knew no more of the way than himself, the round ascent occupying eleven and a half hours.

The second ascent was an impulse. He had lent his guide to a party bound for its summit, he himself sleeping in his bed until nigh six a.m. One first sight of a rare sunny morning and Tyndall must have, that very day, a sight of the world from the top of Monte Rosa. To avoid impedimenta later, he left his coat behind and started in his shirt sleeves, but with no hint of his goal to the guide he procured. Ere long he was making his upward way alone, the fearsome guide paid off and dismissed. "The sun and heaven were glorious, but the cold was nevertheless intense, for it had frozen bitterly the night before. The mountain seemed more noble and lovely than when I had last ascended it; and as I climbed the slopes, crossed the shining cols, and rounded the vast snow-bosses of the mountain, the sense of being alone lent a new interest to the scene." He was then on a dangerous snow-slope, but Tyndall ever loved what Stevenson calls the bright face of danger. Hear him: "The thought of peril keeps the mind awake, and spurs the muscles into action; they move with alacrity and freedom, and the time passes swiftly and pleasantly." So it is with any brave and flint-faced adventurer who, if he be an alpinist, need give no reason for indulgence in that heroic sport, save that he likes it. "No man who ever ascended that bad eminence Primrose Hill, or climbed to Hampstead Heath for the sake of a freer horizon, can consistently ask a better." On the way up Tyndall met the other party coming down, and he borrowed a kerchief to protect his naked

neck from a freezing wind. By and by he stood in solitude on the summit of his splendid mountain. "A world of clouds and mountains lay beneath me. Switzerland with its pomp of summits was clear and grand; Italy was also grand, but more than half obscured. Dark cumulus and dark crag vied in savagery, while at other places white snows and white clouds held equal rivalry. The scooped valleys of Monte Rosa itself were magnificent, all gleaming in the bright sunlight—tossed and torn at intervals, and sending from their rents and walls the magical blue of the ice. Ponderous névés lay upon the mountains, apparently motionless, but suggesting motion—sluggish, but indicating irresistible dynamic energy, which moved them slowly to their doom in the warmer valleys below. I thought of my position; it was the first time that a man had stood alone upon that wild peak, and were the imagination let loose amid the surrounding agencies, and permitted to dwell upon the perils which separated the climber from his kind, I daresay curious feelings might have been engendered. But I was prompt to quell all thoughts which might lessen my strength, or interfere with the calm application of it. Once indeed an accident made me shudder. While taking the cork from a bottle which is deposited on the top and which contains the names of those who have ascended the mountain, my axe slipped out of my hand and slid some thirty feet away from me. The thought of losing it made my flesh creep, for without it descent would be utterly impossible. I regained it, and looked upon it with an affection which might be bestowed upon a living thing, for it was literally my staff of life under the circumstances. One look more over the cloud-capped mountains of Italy, and I then turned my back upon them, and commenced the descent.

"The brown crags seemed to look at me with a kind of friendly recognition, and with a surer and firmer feeling than I possessed on ascending, I swung myself from crag to crag and from ledge to ledge with a velocity which surprised myself." He reached a dangerous part of the mountain in time to see the other party emerging below from a hollow. They had escaped from the perilous "edge which now lay between them and me." With utmost caution and a canny use of the ice-axe he proceeded along this ridge until he came to a place where the snow became granular and the axe comparatively useless. And now his staff of life was mainly his own limbs, which must carry him along an edge past a continuous precipice on one side and a steep slope on the other. He hummed a frivolous song or speculated as to how he might break his fall should he slip and be hurled towards certain jagged rocks below; then doubled his speed till he came to a place of solid ice most perilous. "Encouraging myself by the reflection that it would not last long, I carefully and deliberately hewed steps, causing them to dip a little inward, so as to afford a purchase for the heel of my boot, never forsaking one till the next was ready, and never wielding my hatchet until my balance was secured." Which is good council for step-cutting on steep slopes. In another place (on the ascent) he learns the trick of resting without stopping: "I then slackened my pace, allowed each limb an instant of repose as I drew it out of the snow, and found that in this way walking became rest."

Once below the ugly places, "full of glad vigour" the climber bore swiftly down upon the company in advance and joined them in glissading, galloping, or rolling down, the rest of the way; and but for waiting to walk with a disabled member of the party, he had made the round ascent in a little over nine hours. And now this great mountaineer utters a sober word of warning—solemn precept against his own perilous practice. The dangers of Mont Blanc, Monte Rosa and their kind are very real, and, if not provided against, terrible. He solemnly protests against climbing without guides. "Less than two good ones I think an arduous climber ought not to have; and if climbing without guides were to become habitual, deplorable consequences would assuredly sooner or later ensue." And, concerning the Canadian Alps and young Canadian climbers, "even so, it is so,"

else our mountains will have their sacrifice. “You cannot trifle with great mountains,” said the President of this Club to a solemn group.

There must be some who remember those great lectures by Huxley and Tyndall to crowded audiences at the Royal Institution. Friends and colleagues in science, they differed widely in style. We are told that Huxley convinced his hearers whether they would or no; Tyndall won them by a winsome eloquence. It is so in all his mountaineering narrative and description. Comparing it again with “The Playground of Europe” there is in Tyndalls feeling for mountain phenomena an element of reverential wonder and awe. In Sir Leslie Stephen this feeling is wholly of admiration and devotion that is a splendid sort of camaraderie. I may be wrong, but I think he would not appeal as Tyndall would appeal to the reader who had never seen a high mountain range and who knew nothing, even at second hand, about mountaineering. Nevertheless, as I said, “The Playground of Europe” remains a book of surpassing charm, a classic to be reprinted and to find a handy place in the book-shelf of many an alpine climber yet unborn.

Turning again to the “Glaciers of the Alps,” Tyndall will describe glacial action—always in terms of the people, blessings on his memory!—and with the information you get an inspiration to go to your own Alps and traverse glaciers with observing eyes. According to an English critic, a book that is both informing and inspiring, is rare indeed. Well, these are the qualities I find in “Glaciers of the Alps.” There are passages of vivid description and singular beauty I should like to quote, but I shall be content with two more. The first is to illustrate that rare power of which I have spoken. He is making observations on Mont Blanc: “The rocks alongside the glacier were beautifully scratched and polished, and I paid particular attention to them, for the purpose of furnishing myself with a key to ancient glacier action. The scene to my right was one of the most beautiful I had ever witnessed. Along the entire slope of the Glacier des Bois, the ice was cleft and riven into the most striking and fantastic forms. It had not yet suffered much from the wasting influences of the summer weather, but its towers and minarets sprang from the general mass with clean chiselled outlines, some stood erect, others leaned, while the white debris strewn here and there over the glacier, showed where the wintry edifices had fallen, breaking themselves to pieces, and grinding the masses on which they fell to powder. Some of them gave way during our inspection of the place, and shook the valley with the reverberated noise of their fall. I endeavored to get near them, but failed; the chasms at the margin of the glacier were too dangerous, and the stones resting upon the heights too loosely poised to render persistence in the attempt excusable.” Investigation is to him a continual joy. Nothing escapes his quick, eager eye and ear; to wit, when he describes “a blower” in the ice. Nothing daunts him. On his first ascent of Mont Blanc, Huxley gave out and had to remain alone in the cabin at the Grand Mulcts (10,113 ft.) where he waited for seventeen hours. “To the end of my life,” said Huxley, “I shall never forget the sound of those batons.” This was the sound of the ice-axes against the rocks as the party made speed towards the bivouac, which they reached at seven in the evening.

I said investigation was a joy to him, and yet, scientist as he was, there were times when human knowledge must give way to the spirit of beauty, when inquiry concerned only the things that can not be measured.

For, once on the summit of the Weisshorn, a mountain beautiful above all others to him as to many climbers, Tyndall opened his note-book to make observations, but abandoned the attempt. “There was something incongruous, if not profane, in allowing the scientific faculty to interfere where silent worship was reasonable service.”

It was so difficult to choose my last passage that I left it to chance and opened the book

at random, to find the following description, a typical one, from a climb on the Finsteraarhorn. "The dawn advanced. The eastern sky became illuminated and warm, and high in the air across the ridge in front of us stretched a tongue of cloud, like a red flame, and equally fervid in its hue. Looking across the trunk glacier, a valley which is terminated by the Lotsch saddle was seen in a straight line with our route, and I often turned to look along this magnificent corridor. The mightiest mountains in the Oberland form its sides; still the impression which it makes is not that of vastness or sublimity, but of loveliness not to be described. The sun had not yet smitten the snows of the bounding mountain, but the saddle carved out a segment of the heavens which formed a background of unspeakable beauty. Over the rim of the saddle the sky was deep orange, passing upwards through amber, yellow and vague ethereal green to the ordinary firmamental blue. Right above the snow-curve purple clouds hung perfectly motionless, giving depth to the spaces between them. There was something saintly in the scene. Anything more exquisite I have never beheld.

"We marched upwards over the smooth, crisp snow to the crest of the saddle, and here I turned to take a last long look along that grand corridor, and at that wonderful daffodil sky. The suns rays had already smitten the snows of Aletschhorn; the radiance seemed to infuse a principle of life and activity into the mountains and glaciers, but still that holy light shone forth, and those motionless clouds floated beyond, reminding one of that eastern religion whose essence is the re-pression of all action and the substitution for it of immortal calm. The Finsteraarhorn now fronted us: but clouds turbaned the head of the giant, and hid it from view..... The ice-field before us was a most noble one. The surrounding mountains were of imposing magnitude, and loaded to their summits with snow. Down the sides of some of them the half-consolidated mass fell in a state of wild fracture and confusion. In some cases the riven masses were twisted and over-turned, the ledges bent, and the detached blocks piled one upon another in heaps; while in other cases the smooth white mass descended from crown to base without a wrinkle."

I hope I have quoted enough to induce the members of the Alpine Club of Canada to own a copy of this informing and compelling book which will inspire new climbers to honorable achievement in mountaineering and make fain for lost youth readers too old to climb high mountains.

(Signed) E. P.

Rogers Pass Camp.

By S. H. Mitchell.

Who says the word "camp" has a picture in mind. To the child it suggests pavilions hung with gorgeous silks, floored with magic carpets and crowded with fairy attendants. To the ordinary European a camp means row upon row of tents, equidistant, everything mathematically exact, everything dominated by military precision. To the Westerner the term implies a fire, something cooking in a frying pan, and a pair of blankets. Our Alpine Club camps are the golden mean. The fairyland of mountain beauty surrounds them, military discipline is mitigated by western freedom, and the frying pan is assisted in its important mission by a somewhat more elaborate cooks outfit—batterie de cuisine one may call it without affectation, seeing that the beating on the bottom of the big dish pan serves the office of a dinner gong.

The situation of the camp last year was not as picturesque as that held in the Yoho Pass, nor as grand in its surroundings as that in Paradise Valley; but it, too, had its beauties. The view of the Hermit Range and the Rogers Glacier was always fine, whether in the early morning light, in the

setting sun, or when fleecy clouds, ominous of ill but still beautiful, drifted up from the pass below. The scenery of the Selkirks differs greatly from that of the Main Range; owing to the much heavier precipitation, the permanent snow line is at a lower level and vegetation of all kinds is richer. The great trees climbing the hillsides give a softer effect, and over all there is a bloom, a vagueness, very different from the clear outlines of the Rockies. The arrangement of the camp was much as in years past. The official square was the centre from which the life of the camp radiated. An addition was made to its convenience in the shape of a letter rack, hung from one of the poles of the dining pavilion, where those who wished could look for letters. Be-shrew those uncomfortable folk, say I, who cannot do without letters for a short ten days in the year! Mail in camp, wireless telegrams! There will soon be no peaceable haven left on earth.

The builders of the camp had their troubles. Rogers Pass is narrow. The only good camp ground is occupied by the station and hamlet of that name. Through the pass runs the railway, an invention not in tune with the spirit of the mountains. Fortunately, though near, the trains were not visible. At the foot of the hill on which our village lay, the long dark swell of a huge snowshed served as a screen and its lines guided the eye to the heights of Mts. Macdonald and Avalanche upon the far side of the valley. The water supply was plentiful, but scarcely poetic. Unfortunately no mountain stream was available and all water used in camp was obtained from a pipe connected with that supplying the snowsheds, one of the many favors gracefully offered by the C.P.R. However, this served to gratify that class of town-lover which prefers its milk from a nice, clean can, to that coming from a dirty cow.

As usual on reaching camp, the first thing necessary was to worry the President and get a billet allotted. Tents were found, as in former years, floored with fragrant balsam boughs and, in addition, furnished with a basin in the mens quarters as well as in that of the ladies. There was no ice-cold Paradise Brook to make the complexion darkly, deeply, beautifully blue. The softest unoccupied place for a bed was chosen, blankets spread out and dunnage sorted over in the fond hope of reducing things to a system.

"But hark! a sound is stealing on my ear— A soft and silvery sound—I know it well.
Its tinkling tells me that a time is near Precious to me—it is the supper bell."

Fortunately there is always plenty to eat. Ice-axes and alpenstocks would be dangerous weapons in the hands of an infuriated and hungry mob, and the directorate provides against any such direful contingencies. The cooking and attendance were as usual celestial and one did not need to wait until the hereafter to enjoy its benefits. One of the waiters, Charlie Sing, was a born comedian, but such humors are often tedious when repeated. One day a dish of potatoes slipped from his hands: "Ah, ha!" he said, with extreme enjoyment; and twinkling eyes, "Tatas slide allee samee snowslide," and then in a stage whisper: "Heap more tatas, you see."

So evening comes and one strolls round, meeting old friends and making new acquaintances, chattering, laughing, noticing the shadows gathering and falling deeper. The lines on the hills become vague and the, camp fire begins to glow and as a big log is thrown upon it, a mighty blaze leaps into the air. The first night in camp the fun round the fire is but half hearted; people have so much to talk about. They have not shaken off the solemnity and sedateness of everyday life. It takes a day, even in such surrounding, to become childlike again; yet to be childlike is necessary to win the full enjoyment of these mountain camps.

By this time the notices of the morrows expeditions have been posted upon the notice board. Every one sagely remarks "I am going to take it easy the first day," but the boards suggestions are too alluring, and the Presidents tent is thronged with people waiting to put their names down for

the various trips.

First in importance is the official climb. The main object of the camp is—theoretically—to afford novices the opportunity of qualifying as Active Members. The climbs arranged were decidedly harder than those of last year. Most aspirants tried Mt. Rogers, but a few graduated on Mt. Hermit. It is possible to make the ascent of either in one day from camp, but that would necessitate getting to snow level at rather a late hour, and so a small camp was pitched at timber line and ascent to this was made the afternoon before the climb. From the main camp the evening fire of the adventurers was seen shining like a star in the darkness and served as a sentinel to say all was well.

Start was made about 4 a.m. Snow-line was soon reached, ropes put on, and the passage of the Rogers Glacier commenced. This, naturally, was a toil or a pleasure, as the condition of the snow was good or bad. Sometimes, the ascent was made over the glacier and by the snow nearly all the way; sometimes, a long spur of rock was climbed to the summit, making a much more interesting experience.

The ascent of Mount Hermit starts from the same point, but a different route is taken across the glacier, a line straight to the southern face of the peak. The usual route is up a narrow and steep couloir, but this year the climbers wished for a little more variety, and the eastern arête was tackled. It made a very interesting variation. There was just enough difficulty to keep the attention on the alert, the rock was firm and the footing sure. The descent was made by a couloir nearly at the centre of the peak. There were loose stones requiring a certain amount of watchfulness, but watchfulness is an abiding necessity upon the mountains. The glacier was soon reached again and so back to camp.

The views from both Rogers and Hermit are similar. To the east stand Stephen and the mountains of the Great Divide. Close by rises Tupper, only a little snow powdering its inhospitable crags; then, further off, Sir Donald; further still the mountains of the Dawson range are seen framed in the Asulkan Pass. Far in the north rise the mountains of the Columbia snow-field. As ever in these lonely hills of God, peaks rise beyond peaks, vast waves of mountains, unnamed and unknown.

There were many other expeditions. The one to the summit of the Asulkan Pass perhaps best repaid the effort. The path, starting from Glacier House, wandered through the forest and then for five miles up the Asulkan Valley to the foot of the glacier. A land of streams! The brook running down the centre is fed by many waterfalls; the flowers were in brilliant bloom; bright against the blue sky shone the snow. At the head of the valley a small camp was pitched and there the members picnicked, blessed the mosquitoes, sang round the lire and slept the sleep of the open air. An early start was made the next morning. Scrambling up the moraine, the main body of the glacier was reached above the séracs. Owing to the late snow, the crevasses were well bridged. The summit of the pass was easily readied after some patient trudging, and the view that took the sight was superb. The pass dropped steeply on the further side. Across the deep valley lay the whole Dawson Range, the Donkin Glacier winding down from its heart. On the left was the Geikie Glacier. Far to the right Mt. Purity gleamed white, the dark and lonely valley at its foot suggesting by its contrast the possibility of a magnificent etching—if only one could! Close on the right Castor and Pollux and the rest of the Abbott Range walled in the pass. Turning fully round, the whole of the noble Hermit Range was clear across the green Rogers Pass.

This expedition ended in various ways. The obvious and least interesting was to return the way one come. One party ascended the ridge and, scaling Castor and Pollux and other peaks, came

to Mt. Abbott, and so down to Glacier House. This made a very long day. Another party switched round from the summit of the pass on to the névé of the Illecillewaet Glacier. This entailed some interesting rock work. In one place a cornice was so heavy that it had to be cut through and the guide let down to spy out the land. All was satisfactory and the snow-field was gained and traversed to Perley Rock. By the time that was reached the day was getting old and much snow had melted. When the glacier was left and the rocks traversed the streams were found to be very full and a good deal of difficulty was experienced in crossing them. However, a bath on a hot day was found to be an amusing episode—when it was over—and camp was reached in the best of spirits.

Another expedition popular with the less stalwart climbers was the visit to the Cougar Caves. The old "tote" road, used during the construction of the railway, was followed for the first part of the journey. It wound through the woods along the bank of the Illecillewaet until the mouth of Cougar Creek was reached. The valley lying between Cheops and Cougar mountain is of more than usual interest. It is sharply divided into a lower V-shaped water-cut, and an upper U-shaped glacier cut valley. At is upper end are several small glaciers. Looking down the valley magnificent views of Sir Donald are obtained. Much snow still lingered in sheltered places, and where it had lately disappeared the yellow flowers of the Adders Tongue made patches of brilliant color. As the caves were approached the snow become more plentiful, and in their immediate neighborhood was thick enough to give an aspect of winter.

There was general disappointment when the custodian of the caves told the travellers that, owing to the lateness of the season, the water was unusually high, and hence the greater extent of the caves were inaccessible. A large log house of three rooms was used as a sleeping camp, and meals were served in the custodians comfortable cabin. One party was detained an extra day by very heavy rain, but though necessarily a burden in a small house, were made most welcome by Mr. Deutschman. The caves were visited as far as the water would allow. Acetylene bicycle lamps were used instead of the traditional tallow "clips" and answered the purpose admirably. The caves, as far as they were seen at this time, are a series of passages and circular pot-holes, worn out of the limestone, which in places is marbleized. The lighting of a piece of magnesium wire had the usual uncanny effect. Still, something was lacking; there were no stories of smugglers or banditti; nothing to give delightful shudders.

The journey home was made either by the trail down the valley, or by Baloo Pass and Bear Creek. There is no trail through the pass and the scramble to its summit through the thick and tall underbrush gave those who chose that route a very interesting time. Bear Creek has a way of raging that is somewhat disquieting to those who love to go dry, but it runs through a delightful valley down to Rogers Pass. From it Cheops and Ursus Minor are best ascended, but the weather prevented these climbs during the life of the camp.

Owing to the large number of two-day trips the camp fire was not so crowded as usual; but after the apparently inevitable hymns were over many good songs were enjoyed. No song is too old or too hackneyed for such a time as long as it has "go." "John Peel," the Vicars song from the "Sourcerer," "Mrs. Henry Hawkins" and many others helped to cheer the night.

One evening a topical song duet was brought two lady artists, "The Clarget Springams," which caused much amusement and had to be repeated several times. However, the humors of the camp fire, like greater mysteries, are only to be understood by the initiated.

During the Camp the Annual Meeting of the Club was held, at which several matters vitally affecting the future welfare of the Club were discussed.

After a stirring address from the President, the reports of the different officers were read,

and finances and business generally were found to be in a flourishing condition. The ballots for the various officers were counted and the results announced. The President then proceeded to show how the work of conducting the Club had increased to an extent that made it a serious burden to those who had so far willingly given of their scanty spare time to its carrying out. It was, therefore, decided to appoint a salaried Executive Secretary who could devote all his time to the business of the Club.

The President then recalled the offer made by the Dominion Government of the lease of a plot of ground in Banff on which to erect a club-house. It was felt that the time was ripe and that the option should not be forfeited, but it was also evident that the Club could not finance the building out of its income. A scheme of ten year debentures bearing interest at six per cent, per annum was arranged, and a large amount was subscribed on the spot.

It was also decided that incorporation be applied for at the coming session of the Alberta House. The meeting ended in general satisfaction and enthusiasm.

The Art Competition was most interesting, but the number of entries was not as large as it should be. There were nine exhibits divided among the three classes. The prizes were awarded to Mrs. J. W. Henshaw, H. G. Wheeler, and P. M. Humme.

Representatives were present from the Alpine Club (England), the Alpine Club of the Netherlands, the American Alpine Club, the Appalachian Club, and the Mazamas of Washington. Sir William Van Home sent a delightful sketch of himself as a well-nourished “merry Swiss Boy” leaping ponderously from rock to rock. Kindly communications were received from Sir Sandford Fleming and the several honorary members.

As in former years the Club received help and encouragement from all the powers that be. The Dominion Government lent the services of the President, Dominion Topographer, and his survey party for the week of the camp; the Government of Alberta, although camp was held in another province, generously gave a grant of $500; and the C.P.R., not only in the way of rates, but through their several departments, gave every accommodation in their power. The Club is grateful, and, in return, does much for the advertising of those parts of Canada hitherto but slightly appreciated.

And so the happy week wore to its end. The canvas village fell; the hillside was left bare and lonely. Nothing to show for it all? Yes! what all pursuit of true sport entails: a gain in health and discipline of character, a host of happy memories.

IN MEMORIAM.

William S. Vaux, Jr.

During the past year Science has lost, through the death of William S. Vaux, Jr., one of her modest devotees who was doing conscientious and painstaking work along quiet and unspectacular lines, of which not a great deal is heard, but which added materially to the sum of human knowledge respecting the laws of Nature and their application.

Mr. Vaux was born in Philadelphia April 1st, 1872, and was educated in private schools there, and graduated with the degree of B.S. in the Engineering Department of Haverford College in the class of 1893. Always having a strong methodical bent, while in college he did much practical

work of value. Among other apparatus in the construction of which he took a leading part was a dynamo, which did good service for years in the lighting plant of the College.

After graduating, Mr. Vaux soon began to apply himself with assiduity to his chosen profession, that of an architect. Whilst not lacking in artistic feeling, he devoted his energies largely to the practical side of his subject — strength of materials, construction-design, lighting, heating, ventilating, etc. This brought him in contact with the contractors and their employees. By these men he was universally respected. They knew he would not pass inferior work, or permit his clients interests to be slighted. At the same time, it was felt by all that he would be perfectly fair and just in his dealings, and that no one would have real cause to complain of the way in which he would construe contracts, drawings, and specifications.

Whilst his professional career was a short one, there are a number of important buildings in and near Philadelphia which will stand as monuments to his ability as an architect.

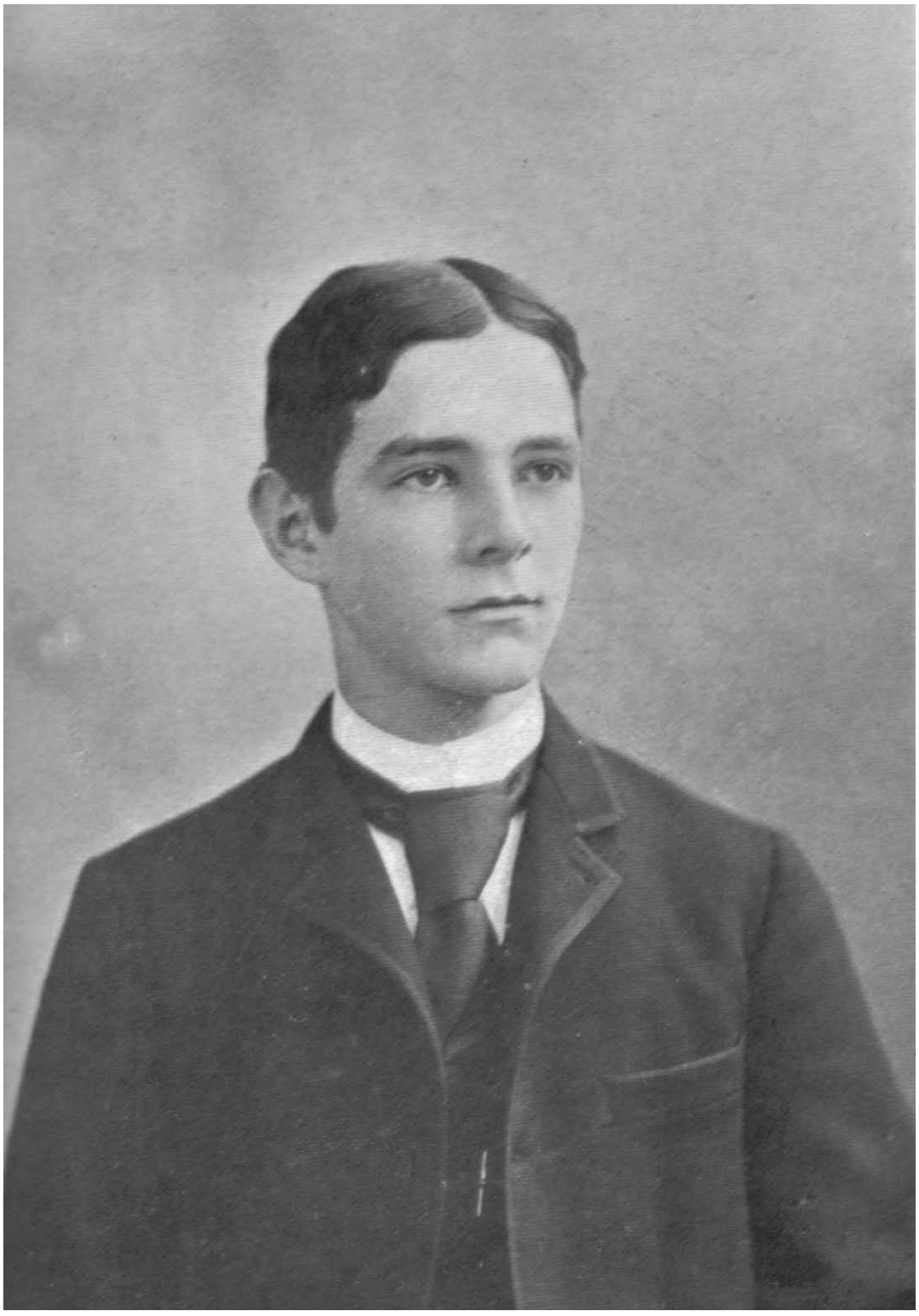
Coming of families, on both his fathers and his mothers sides, who had been interested in scientific pursuits and investigations for generations, it is not surprising that this realm should have appealed to him strongly. Whilst not particularly caring for mathematics, something of the character of his pastimes may be gathered from the title of his graduating thesis at college, "Gyroscopes and Gyrostats and Gyrostatic Motions." When a boy of less than fourteen years, he wrote, printed and illustrated with his own photographs, a miniature book, descriptive of his trip to the Yellow-stone National Park. Later, a photographer of more than usual ability, his first pictures were made with a camera he himself constructed as a boy of eleven or twelve, using a pin-hole for a lens. These incidents are mentioned to show that he was thorough in his undertakings, not afraid of work, and accustomed to understanding his subjects from their foundations up.

Outdoor life appealed strongly to his manly, joyous character. Accordingly, we find him as a foundation member and the Treasurer of the American Alpine Club and an early member of the Alpine Club of Canada. For both of these organizations he qualified by his years of patient observation and study of the glaciers of the Canadian Rockies and Selkirks. Mr. Vaux first visited these regions in the summer of 1887, when a boy of fifteen years. His second visit was in 1894, and subsequently he pursued the matter each summer from 1897 to 1907, with but one years intermission caused by business exactions.

From the first of these visits the phenomena of the glaciers attracted his attention, but it was not till the summer of 1899 that his work took really definite form.

Then it was, that with the assistance of his brother, George Vaux, Jr., he made a fairly accurate survey of the forefoot of the Illecillewaet Glacier; laid out a line of plates to measure its rate of flow; did much work on its recession; mapped the tongue and adjacent moraines, located the various rocks previously marked by other observers, gathering all possible data respecting them; and made a photographic survey of the tongue. The results were published in a paper read before the Academy of Natural Sciences of Philadelphia the following winter. Subsequently, each season, this work was kept up systematically, reports being furnished to and published by the Academy of Natural Sciences of Philadelphia, and also the International Commission on Glaciers, which did him the honor to reprint in full his last detailed paper presented to the Academy of Natural Sciences of Philadelphia, and published by it. This was the first time in the history of the Commission that any extensive paper, not prepared especially for it, was so reprinted.

His investigations, however, must not be thought to have been limited to the Illecillewaet Glacier. The tongue and surroundings of the Asulkan were also surveyed and mapped; its rate of flow measured by setting out plates; and its various advances and recessions studied.



William S. Vaux, Jr.

In the Rockies his work was less detailed, but valuable. It has included measurements of the rate of flow and recession of the Victoria Glacier; of the recession and structure of the Yoho Glacier; also general conditions of the Wenkchemna Glacier and of the Bow Glacier. On all these, reports have been made and the maps above named and many photographs published.

A little popular treatise upon glaciers, published with illustrations, in a number of successive editions, year by year, by the Canadian Pacific Railway, was largely from his pen. It has had some vogue in high schools as a text book. His last contribution was presented to the Academy of Natural Sciences of Philadelphia in December, 1907, and embraced the results of observations made during the preceding summer. This was a paper of four pages.

In March, 1900, he prepared for the Engineers Club of Philadelphia, a paper published the following May, in which were described very entertainingly the engineering difficulties connected with the construction of "The Canadian Pacific Railway from Laggan to Revelstoke, B.C."

It was also to the Engineers Club of Philadelphia that he contributed, in May, 1907, the paper republished herewith. It gives in his own words the best account extant of some of the investigations that had so deeply engrossed his attention by way of recreation.

His work in preparing the report of his 1907 observations was the last that he was able to do. On July 23rd, 1908, he died at his fathers summer home at Bryn Mawr, Pa., leaving behind a vacant place in the hearts of many friends.

"Lookin Back."

Wathers o Moyle an the white gulls flyin,
Since I was near ye what have I seen?
Deep green seas an a strong wind sighin
Night an day where the waves are green.
Struth na Moile, the wind goes sighin
Over a waste o wathers green.

Slemish an Trostan, dark wi heather,
High are the Rockies, airy-blue;
Sure ye have snows in the winter weather,
Here theyre lyin the long year through.
Snows are fair in the summer weather,
Och, an the shadows between are blue!

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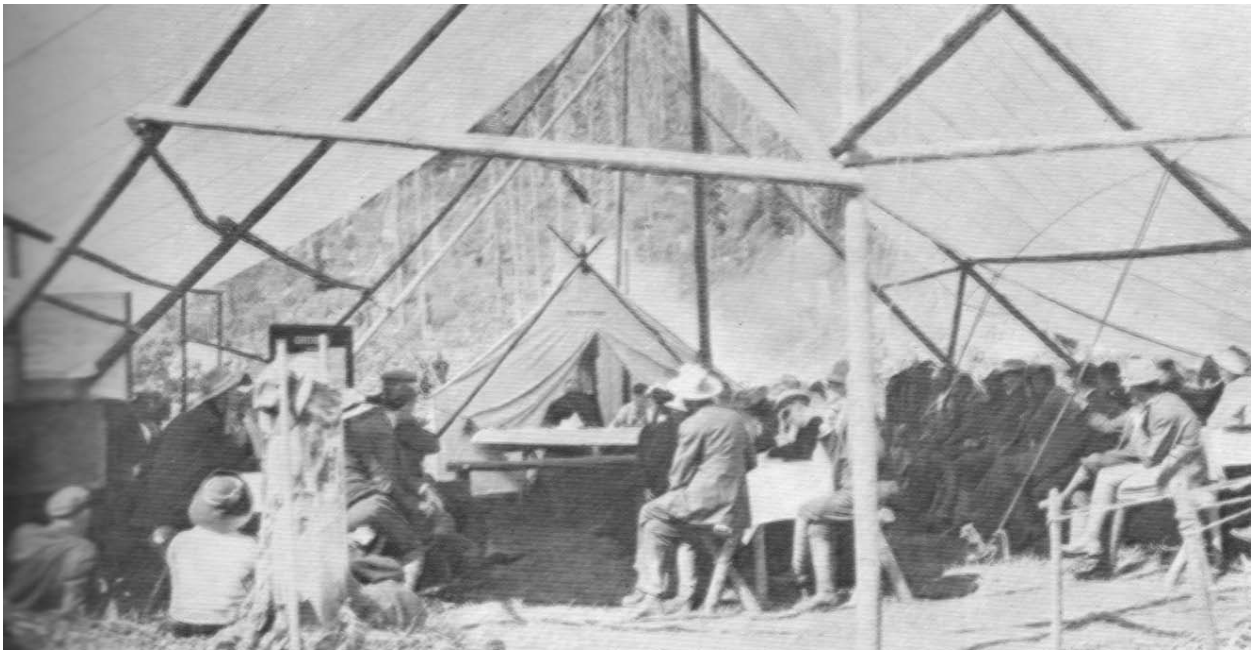
"The North-West—Canada."

Oh, would ye hear, and would ye hear
Of the windy, wide North-West?
Faith! tis a land as green as the sea,
That rolls as far and rolls as free,
With drifts of flowers, so many there be,
Where the cattle roam and rest.

Oh, could ye see, and could ye see
The great gold skies so clear,
The rivers that race through the pine shade dark,
The mountainous snows that take no mark,
Sun-lit and high on the Rockies stark,
So far they seem as near.

Moira O'Neill.

(From " Songs of the Glens of Antrim.")



Annual General Meeting At Rogers Pass Camp. C.H. Mitchell, Photo.

An Important Question Comes Up. C.H. Mitchell, Photo.

ALPINE NOTES.

An Act Of Heroism.

All who know anything about the Canadian Rockies will have heard of the oldest and most celebrated of its guides, Tom Wilson, of Banff, who was with Major Rogers during construction days of the Canadian Pacific Railway, and who discovered the famous Lake Louise and the Yoho Valley. Mr. Wilsons home is at Banff, but his business of horse-ranching takes him for a large part of the year to the Kootenai Plain, on the North Saskatchewan, where his ranche is situated. Some little time before last Christmas Day he started from his ranche to celebrate the annual festival with his family at Banff. It meant a snowshoe tramp alone of seventy miles through lonely tree-clad valleys, through rock-bound gorges and over wind-swept passes, where all nature lay stark and stiff in the icy grip of winter. The tale is best told in Mr. Wilsons own words, and those who know can easily read between the lines and can, perhaps, picture the terrible agony, the fierce despair, the grim determination, and the hardly-won fight against that overpowering desire to sleep which is the most deadly enemy in a case of this kind. The trip was made up the Siffleur River, over the Pipestone Pass and down the Pipestone to Laggan, and so by rail to Banff. Mr. Wilson writes me :—

"There is not much to tell of my trip over the Pipestone Pass. It was simply the case of a man starting on a seventy-mile snowshoe trip across the mountains to eat his Christmas dinner with his wife and family, and-of getting there and eating the dinner, the pleasure being well worth the trip. I rode to within eight miles of the summit and started early the next morning on snowshoes to cross the pass (8,300 feet alt.). It was snowing a little and very cold when I started, and when T got opposite the Clearwater Gap a blizzard came up, and I could not see more than six or eight feet ahead in that grey snow light that makes everything look level. I was on the trail along the mountain side, and was afraid of falling down one of those steep side collars (which you will remember on that side), and of breaking my snowshoes, so I turned and went down the mountain to the creek bottom. The snow was seven or eight feet deep and I fell through a snow bridge, getting both feet wet. It was below zero and a long way to timber whichever way I turned; a little nearer turning back, but I never like hitting the back trail. It was eight oclock at night before I crossed the summit of the pass and reached the first timber. I got a fire started, but it was drifting and snowing so hard that the snow covered my sox and moccasins as fast as I could wring them dry, and, owing to the fierce wind, the flames leaped in every direction, making it impossible to get near the fire, so at half past nine I gave it up, put in my wet footgear and snowshoes and started down the valley. I could not see and felt the way with a stick. By daylight I had made three and a half miles; not much, but it kept the circulation going. In the heavy timber I made a fire and got dried out. My feet were beginning to pain as they had been thawed out twice already. I made three miles more that day and finished the last of my grub. The big snowshoes sank fifteen inches in the soft new snow and were a heavy drag on frozen toes. I saw it meant three or four more days tramping without grub to make Laggan. I made it in three, but the last day I could only make about fifty yards without resting, and my back tracks did not leave a very straight line. The chief trouble I had was to keep from going to sleep; it would have been so much easier to quit than to go on."

Mr. Wilson concludes his letter with the remark, "I think this is the longest letter I ever wrote."

Think for a moment what it really meant; that every time he put on his snowshoes his toes got frozen owing to the tight shoe straps; that every time he took them off his feet had to be thawed out; that every step had to raise a load of ten to fifteen pounds of soft snow; that wood had to be collected and cut to keep alive during the night; that fierce pain would drive away sleep; that he had no food, and always before him those interminable, slow, dragging miles of snowy wilderness. It must have required iron determination to make the end of that never-ending track, to eat his Christmas dinner with his wife and family.

Even such an awful experience could not dull Toms keen native wit, and his remark to the doctor while examining his poor feet, "I hope I wont have to lose them, Doctor, Ive had em a long time and Im sort of used to em," shows the spirit of the man. We are happy to add that Mr. Wilson is now progressing well towards recovery. He has lost part of several toes on each foot, but as he says himself, the doctor has left him well balanced, by taking the same number of parts from each foot, and he can't complain.

An Attempt On Mt. Sir Sandford.

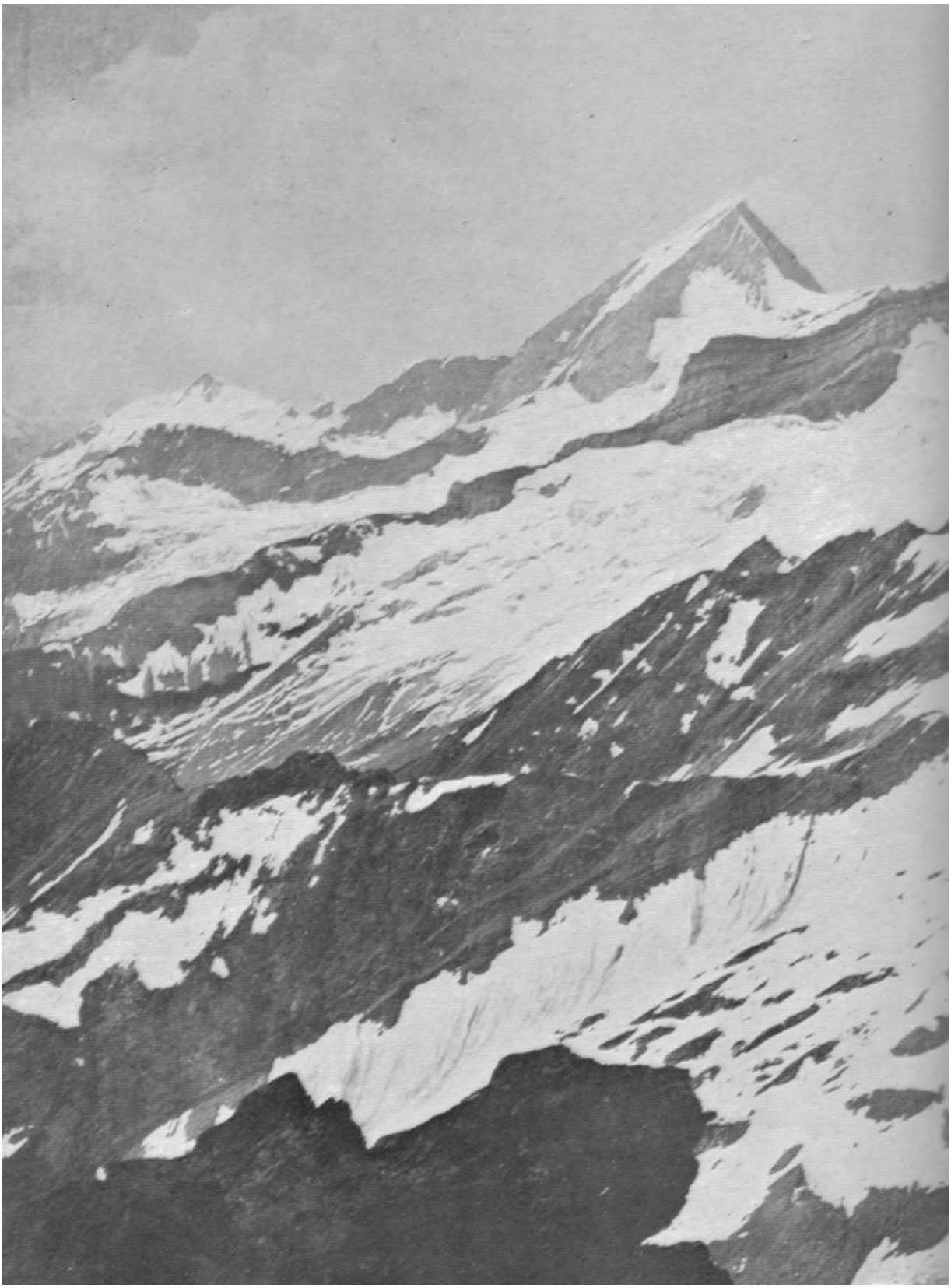
At the close of the Rogers Pass camp of 1908, B. S. Comstock, of New York, and H. Palmer, of Boston, both Active Members of the Club, accompanied by two guides, Manuel Dainard and Ed. Robinson, of Golden, B.C., made an attempt to reach the summit of Mt. Sir Sandford. A brief account of the expedition has been furnished the Journal by Mr. Palmer, as follows:—

"We left Glacier House for Beavermouth on July 18th and camped there over night. Next morning we started down the Columbia River in two canoes. The river was very high, about fifteen feet above its usual level, and the current correspondingly swift. The nineteen miles to the mouth of Gold Stream was made in about two and a half hours. Near this point we had a very good view of Mt. Sir Sandford, some ten miles inland. Little more than the peak was visible as the slopes of the valley of Gold Stream are very steep, so that a short distance down stream the view of the peak was cut off, but we had the opportunity of seeing the east extension of its base. This terminates in a double-peaked massif, for which we suggest the name Mt. Taurus as appropriate because of its horn-like summits. Below the massif nestled a good-sized glacier—peaks and glacier being visible from the Columbia.

"We pushed up Gold Stream, which is about the size of the Beaver River, with much difficulty, for about two miles, then landed on the north bank and left out tent and provisions. From this point it took two days of very slow work, pushing through the thick growth, to reach the spur descending from Mt. Taurus to the west bank of Gold Stream. At this point a branch of Gold Stream enters from the west, draining a valley parallel to the Columbia, north of Mt. Sir Sandford.

"The third day we spent climbing the spur, reaching an altitude of 4,000 ft. that night. The fourth day we managed to make 2,500 ft. and established another camp at timber-line, still on the spur. At this point our provisions were much reduced and we could only remain to continue the climb one full day more. Sir Sand-ford had been invisible since leaving the Columbia.

"The fifth day we traversed the entire easterly termination of the Sandford Range to the south-east arête, crossing below a smaller glacier. An ascent of this brought us to a minor summit to the south of Mt. Taurus, at an altitude of approximately 9,000 ft. from which the entire region to the south and south-west was visible, as well as the whole northern chain of the Rockies on the further side of the Columbia. Sir Sandford was something over two miles to the west of us and presented a most striking appearance. The day was a glorious one and not a detail of the



Mt. Sir Sandford From East Ridge At Altitude 9000 Feet. Howard Palmer, photo.

magnificent panorama was hidden. We spent three hours on this point, photographing, sketching and erecting a stoneman. We named the peak Cornice Mountain because of the large cornice which overhangs the small glacier before mentioned. Our return was comparatively uneventful and on the fourth day following we again reached Beavermouth."

It was found impossible to ascend the mountain from this side. To reach its summit it would have been necessary to descend far down the valley and follow to its source a tributary stream until the further side of the mountain was reached, some six or eight miles distant. It would have meant a weeks work longer and there was only food enough to take the party back to the railway.

New Route Up Mt. Sir Donald, 1908.

Mr. J. P. Forde has contributed the following note: "There are three known routes to the summit of Mt. Sir Donald, spoken of respectively as:

(a) The Huber and Sulzer route, by which the first ascent was made in 1890.

(b) The Green and Leprince Ringuet route, which was followed by those gentlemen in 1888 and 1899.

(c) The Vaux route, used by Vaux in 1900, and since generally followed.

"The latter route necessitates the crossing of a couloir which is almost always in a dangerous condition, owing to the great frequency with which small avalanches of ice, rock and snow are encountered in it. The first party to ascend the mountain in 1908 reported this couloir to be in a particularly dangerous condition at that time (July 9th), and the guide was reluctant to take another party on the mountain until later in the season.

However, as a second party had arranged to make the ascent two days later the guide was prevailed upon to accompany them. They had heard of a new route which led up through a small chimney, by which the dangerous couloir could be avoided, and, as they were anxious to learn if this route was a practicable one, they decided to investigate it.

"The Vaux route was followed until shortly after the bergschrund was crossed, and the chimney was then reached by bearing upwards and to the right of the usual route. It was found to be about seventy feet in height and from two to five feet wide, gradually narrowing towards the top. The face of the wall at the back of the chimney has a slope of about 70° from the horizontal for the first fifty feet, and at the top it is actually overhanging. The guide worked his way up first, assisted by the second member of the party, and as each few feet was gained he braced himself, and the others followed, assisted by the rope and axes. The first fifty feet did not present any particular difficulty, but the last twenty feet was only gained by hard fighting. However, the top of the chimney was reached after two hours work.

"A traverse was then made towards the left, and the usual course was joined at the point where it emerges from the couloir onto the solid rock. During the traverse two nasty corners had to be rounded, but with ordinary care they were not dangerous. The Vaux route was then followed to the summit.

"On the descent the route by the chimney was used, the guide lowering each of the party in turn on the rope, and one of the party paying out the rope around a rock at the top of the chimney to lower the guide.

"At the time of this ascent (July 11th), there was considerable ice in the chimney, which rendered the passage through it somewhat more difficult than would be the case later in the season.

Also, during the descent, which was made about one oclock and which took about an hour, a small cascade of water was falling through the chimney, which thoroughly drenched the party, but which would not likely have been encountered a few days later.

"A permanent rope at this point would render the passage of the chimney comparatively safe and easy, and when a rope is in place the writer considers that this route should be taken, in preference to the one through the more or less dangerous couloir."

In addition to the routes Mr. Forde mentions there is a fourth, viz.: that by way of the north arête. The climb was made on September 3rd, 1903, by E. Tewes, of Bremen, Germany, assisted by the guides Edouard Feuz and Christian Bohren. (See Wheelers "Selkirk Range," page 347).

INDEPENDENT MOUNTAINEERING.

Mt. Stephen.

Immediately after the Rogers Pass Camp a number of the members, in two parties, made the ascent of Mt. Stephen. The first rope was in charge of P. D. McTavish, the second of D. N. McTavish. The climb is worthy of note as it marks a new era among Canadian mountaineers, viz., that of climbing an important peak without professional guides. Messrs. P. D. and D. N. McTavish had already distinguished themselves by two ascents of Crows Nest Mountain, but Mt. Stephen, which is the stock climb for the Swiss Guides stationed at the Canadian Pacific Railway Companys hotel at Field, is in a higher class. The others who climbed were: the Revds. Gordon, Fraser and Kerr; Messrs. Watt, Wilson, Hart, McCoubrey. Dr. Crawford and Miss Patterson graduated upon this occasion.

The party left Mt. Stephen house at 7.15 a.m. Being a large one, with several novices, great care was taken and the ascent made very slowly but surely. The summit was not reached until 3.45 p.m. The descent was commenced at 4 p.m., and the hut above the fossil bed reached at 8.30. From that point to the hotel is a beaten path. Mt. Stephen is described by the party as a splendid rock climb.

Mt. Edith.

A month later a party composed of Messrs. Hart, Wilson, Darling, McKillican and Miss Stewart, under the leadership of P. D. McTavish, climbed Mt. Edith. It is stated that the last 700 feet is very difficult rock, rotten and dangerous. At one place the route of the climb led up an inclined hole for a distance of sixty feet. A cairn was found on the summit. It is likely that the cairn was that placed there by Dr. N. J. Collie, who made the first ascent in 1900, accompanied by the outfitter guide, Fred. Stephens.

At this point it is well to sound a note of warning. We are thoroughly in accord with individual effort, and hold that the only real mountaineering is that done independently of professional guides, who through superhuman exertion and consummate skill take everybody and anybody to the summit of the highest peaks. All honor to these brave and sturdy mountaineers, who risk their lives more often than is realized in the endeavor to populate the mountain summits; who, with infinite patience, place the wayward foot and hold the trembling hand, who even carry in their arms, cross dangerous places, those whose nerves have risen in revolt, and on their backs those whose legs have run riot. All honor to them! we say. Their patience is inexhaustible, and their powers inestimable. One of the guides at Glacier, once asked how he had managed to get a certain

rotund gentleman to the summit of Mt. Sir Donald, replied: "Oh! That is nothing. We could take up a dead man."

But, while independent mountaineering is the only true mountaineering, and individual effort and ability bring the only really satisfactory results, it is absolutely a necessity first to learn the game and to acquire the requisite knowledge and skill before risking your own and other lives in what may eventually prove most dangerous places. It is so easy to go forward, so difficult to go back; so easy to ascend and so difficult to descend. The snow bridge does not collapse until you are on it; the avalanche does not start until you have given it momentum; the cornice does not break until you have displaced its centre of gravity, and then you learn too late, and the experience is for the others, if others there be. The prevailing inclination is to minimize the difficulties and dangers of a mountain and to overrate your own powers and those of your party. Remember, the older and more experienced the guide, the more careful he is; and do not forget that a chain is no stronger than its weakest link. Before taking an untrained party for the climb of a big peak you should know your route; you should know their powers; you should know the uses of the ice-axes and rope; you should be able to judge the strength of an ice bridge, or the hold of a snow slope on the mountain side; you should instinctively understand where rockfalls occur, and your ear should be ever alert for an avalanche. Above all, never take upon a rope a greater number than can be guarded by its use. Otherwise, instead of being a safeguard it becomes an instrument of death. This to the guide. For the others there is but one word: "Obedience."

Mt. Garibaldi.

In July of last year the third ascent of Mt. Garibaldi was accomplished by a party of four gentlemen from Vancouver. A camp was set at timber-line on the south face, beneath the southern pinnacle, the ascent to that point being made by the south slopes of the Tsee-Ki Canyons. This route, as compared with the north one of the first ascent, is fairly easy, being more open and freer from bluffs.

A few days were spent exploring the wonders and beauties of the forests, alplands and glaciers of the mountain, and viewing the ever-changing phenomena of the region. One gloomy morning found the members of the party high up on the treacherous precipices of the southern pinnacle, within a few hundred feet of the tooth-like point. They were forced to retreat owing to the weather breaking, and it was well they did, for the last glacier was crossed in the teeth of a whistling blizzard.

Two days later they set out again and by 9 oclock were on the main summit, having accomplished the ascent by a new route. Advantage was taken of the occasion to make the first assent of the Dome.

Mountaineering Club Of Revelstoke.

In January of 1909 a number of members of the Alpine Club, resident in Revelstoke, got together and formed a local club for the purpose of mountaineering in the Selkirk and Gold ranges and, avowedly, for the purpose of advancing the interests of and training recruits for the Alpine Club of Canada. The clause of its constitution bearing upon this phase of its propaganda is as follows :—

" Objects :—The Objects of the Club shall be "the promotion of interest in the Alpine Club of "Canada; in general mountain and glacial study; in "mountain climbing; in photography,

particularly as "applied to mountain subjects; and the opening up "of trails and other means of access to particular "points of scenic interest in the neighborhood of "Revelstoke."

The new Club numbers amongst its members some good mountaineers, who have already done something in the Canadian Rockies. Its field of operation—the Selkirk and Gold ranges—presents unlimited opportunities, and in the immediate vicinity of the Clubs headquarters are several peaks that will furnish excellent climbs to train for the larger sphere of the Canadian national club. Chief among these are Mts. Begbie and Cartier; the former in the Gold Range, the latter in the Selkirk Range.

Mt. Begbie was first ascended on June11th, 1907, by a party consisting of the Rev. Dr. Herdman, of Calgary, Vice-president of the Alpine Club; the Rev. J. R. Robertson and Rupert W. Haggen, of Revelstoke, accompanied by the Swiss guide, Edouard Feuz, Jr.

The chief difficulty in an ascent of Mt. Begbie lies in reaching timber-line through the thick matted underbrush that clothes the lower slopes of the mountain. It is necessary to camp out for two nights and all facilities must be packed on the back. In the present case no other difficulty was experienced except that the day was wet and was snowy on the mountain, making the climb disagreeable and cold, and hiding the magnificent view that would otherwise have been displayed. The most exciting incident occurred during the return across the river in the boat which, when near the east shore, was swept against a log and upset. The guide, who was farthest out, had a hard struggle for a minute or two, but eventually all climbed safely on the log and made the shore.

A good work for the Revelstoke Club would be to construct a pathway through the thick growth to timber-line and to erect a suitable cabin for a stopping place near the permanent snow-line. The view from the summit of Begbie is magnificent beyond description, and the climb would undoubtedly become a favorite one for Club members and visitors to Revelstoke.

Climbs Of Importance Made In 1908.

Outside of the work done by the Alpine Club and its members, as set forth herein, few climbs of importance were made during the season of 1908.

By members of the Alpine Club the following peaks were ascended: Sir Donald, Rogers, Tupper, Hermit, Avalanche, Victoria, Lefroy, Aberdeen, Stephen and Edith. Attempts were made on Mt. Robson and Sir Sandford, but were unsuccessful.

By those not members of the Club the most remarkable series was that made alone by Edward Franzelin of Bruneck, Tyrol, Austria, from Glacier House. The record reads as follows: "6th July, Mt. Sir Donald; 7th July, Asulkan Pass, Dawson Glacier; 8th July, Hasler Peak, Feuz Peak, Michel Peak (of Mt. Dawson), Donkin Pass; 9th July, Dawson Glacier, Asulkan Pass, Glacier House."

Next in importance was that by Prof. Holway, F. K. Butters and Howard Palmer, the latter a member of the Alpine Club. An account of their expedition to the ranges beyond the Asulkan Pass appears in the Journal, contributed by Professor Holway. The first ascent of Cyprian Peak of the Bishops Range was successfully accomplished by these gentlemen, who did not employ Swiss guides.

Climbs by others, assisted by Swiss guides, were also made of Mt. Sir Donald, Mt. Sifton and Truda Peaks. In the main range an English gentleman and lady made the ascent of Mt. Vaux. A few ascents were made of Mt. Stephen, Mt. Aberdeen, and several of the minor peaks surrounding Lake Louise. The foregoing practically embraces the mountaineering work of 1908.

REVIEWS.

The Rockies Of Canada.

By Walter Dwight Wilcox, F.R.G.S.
(Revised Edition, Putnams).

Once again Mr. Wilcox has revised his well-known work on the Canadian Rockies. In this latest edition old matter has been deleted entirely to give room for new, and parts of the remaining text have been re-written. The illustrations in photogravure are many and lovely, about one-half now appearing for the first time. In the preface he modestly expresses a hope that the "general standard of illustration has been materially raised." But Mr. Wilcox has achieved much more: over and over again in these reproductions of mountain landscape, he has lifted photography into the realm of the highest art. With infinite patience and devotion he has composed his picture, choosing artistic foreground and magnificent perspective, and waited days or weeks or years for the atmospheric moment—the summer haze, the sky, the clouds in sunshine or in storm, and all the fickle phenomena of those "high midsummer romps" in Alpine regions. His reward has been in such pictures as "Lake OHara" and the long shadows in the morning light; as the "View from Little Beehive," with its perfect foreground, of fir and rock and sleeping tarn with the splendour of mountains and glaciers beyond bathed in tenuous haze; and the "Storm Scene," showing a trees marked branches outlined clear against an angry sky. As he confides to the reader, Mr. Wilcoxs method is entirely empirical, and he has thus learned the trick of reproducing with camera, atmospheric effects in Alpine landscape that challenge the brush and palette. Patience and passion for mountain beauty and life in the wilds are the chief elements in learning of that kind.

It has become a commonplace to refer to "The Rockies of Canada" as a charming book. Now, apart from its sumptuous illustrations, where lies the charm? I think it lies in this genuine, deep-rooted love of the mountains, and the unconscious candour with which the writer is always taking the reader into confidence. All his descriptions have that unmistakable note of genuineness, of frank and winsome confidence. Here, and here, and here, in these remote mountain-places may the reader come for refreshment of body and spirit. The writer is not outside his book, but in it. I cannot put myself in the place of a reader who never saw an alpine scene, but I think these chapters all inspire a longing for the distant mountains, even in those who refuse to travel.

Then, again, many summers visits to the high Canadian "Playground" have resulted in that fine culture of the inward eye which Wordsworth more than any great teacher of Nature (unless it be Browning in "Pippa Passes") has emphasized. Mr. Wilcox, too, knows well, as Wordsworth knew, that "Nature never did betray the heart that loved her," that she will through all the years of earth "lead from joy to joy."

On opening the volume for a quotation from one of the many descriptions of mountain phenomena, the page turned at a passage on Lake OHara and, for an obvious reason, I am very glad. "Every season, and even each passing month, reveals new and unexpected cloud-forms, and now a certain type of high fog came pouring through the mountains that I have never seen before. At early dawn each day the peaks are concealed from view, by noon the black clouds, with edges of silver torn into fragments, are driving among the higher cliffs before a violent wind, while in the valleys there is perfect calm. Later in the day, bright clouds, riding above the highest peaks, move serenely across the blue sky.

"Night before last the coal-red fire of sunset seemed to set the mountains on fire, under steel-blue clouds. To-night it is colder. The glow of sunset rises higher and higher on the snowy summit of Lefroy, and the fleecy, melting clouds take on a bright tone in the darkening sky. A coal-black seam of rock on the upper ledges of the mountain now, for the first time, strikes my eye and startles me. How many years it requires to see the mountains, even such a scene as this in their entirety! A pink cloud-banner hangs for a moment to one side of an uplifted ledge of rock, while above there is a grey cloudlet, and even as I jot down these lines and look up, the rich pink has faded away, and sudden darkening takes place, and deep night seems to be hovering behind those eastern ridges. A frosty chill seemingly comes out of the forest and tells that the day is finished. The inverted trees in the green water are darkening, and across them the blue camp-fire smoke, down the shore, throws a mystic veil, and is wafted gently lakewards, amid complete silence.

"The colors are coming back again. An opaline cloud with milky border shows fire underneath, the sky is steel blue, and the uppermost glacial ice is the greenish-yellow of chlorine. Has the sun shot a last ray through some far-off pass in the Selkirks that makes this sudden illumination?"

The last sentence reminds us of Tyndall. We cannot but be impressed with the forthrightness and truth of this description. Mr. Wilcox himself will never forget the "ineffable pomp" of those two sunsets. They will often flash upon his inward eye in solitude or in the din of cities. But he is writing all that down that our minds may share the sights.

The volume contains much practical information out of his own exploring experiences. There are chapters on Hunting and Fishing, the Stony Indians, Mountaineering; but the greater part of the book deals with all that wonderful Lake Louise region, much of it Mr. Wilcoxs own discovery, with Mt. Assiniboine, and with the less-known mountaineering ground leading to the great Columbia Ice-field.

"Stickeen, or the Story of a Dog," by John Muir, is a very little book, but it has the qualities necessary to keep the reader out of bed until he finishes it. It is all about an adventure, thrilling and terrible, on an Alaskan glacier, during a day of continuous storm. Stickeen is only a wee mongrel, but he has already joined "Rab," whose peer he is, and the choice company of immortal dogs. This, by virtue of his own devotion and daring heroism and Mr. Muirs beautiful, picturesque prose. " Stickeen" will surely take its place as a little classic in the literature of glaciers and of dogs.

"Some Adirondack Paths" is the title of three papers by Mr. F. W. Freeborn, published in "Appalachia," and now bound separately in a neat volume for the library of the Alpine Club of Canada. All three papers describe various paths to picturesque summits enclosing a lovely valley in the Adirondacks. Mr. Freeborn is a veteran of the mountain trails. He has an eye for locality and a genius for accuracy. Any reader of his narrative needs no better guide book. He will be directed by this landmark and that, and he will know to the minute how long it ought to take him to make any round excursion from the Tahawus House in Keene Valley to Mt. Baxter, the Giant, or any summit in the neighborhood. There is also a fine sketch map drawn by the writer who, as the prettier eastern word is, writes "brook" instead of "creek" to indicate the streams. But the most poetical word of all is "burn" and written only north of the Tweed.

E. P.

OFFICIAL SECTION.

Report Of Hon. Secretary.

In the year which closed on March 28th, 1909, the third of its existence, the Alpine Club of Canada has made substantial progress. At this writing the membership of all grades stands at 447. Notable in the increase are four Associate and three Life members; also an Honorary member, Mr. Walter Dwight Wilcox, F.R.G.S., author of "The Rockies of Canada."

The Annual Meeting took place on July 10th, 1908, at the Camp in Rogers Pass. Its chief feature was the Presidents address, which dealt in considerable detail with the proposed Club House, with incorporation and with the prospects of the Club. Officers were elected for the ensuing term of two years, those newly elected being: Messrs. J. D. Patterson and M. P. Bridgland, as Vice-Presidents; C. W. Rowley as Treasurer; and D. H. Laird, Stanley L. Jones and Frank Yeigh as Advisers on the Executive Committee.

Executive meetings of the year were as follows: At a meeting during the camp the names of Mesdames Wheeler Burns and Rowley were added to the Executive to form a Building Committee. Resolutions were carried that the Library subscribe to the Champlain Society for its rare and valuable books, not otherwise obtainable, on Canadian History; that copies of the Journal be sent to the leading Clubs; and that a handbook containing the constitution and a list of members be prepared.

On December 15th, in Calgary, the Executive received from the auditors, Messrs. J. B. McLaren and J. W. Kelly, a present of a handsome loose-leaf ledger and journal, and passed a hearty vote of thanks to the donors. Other resolutions were that the word Alpine be registered as the address of the Club with telegraph and cable companies, and that the A.B.C. code, fourth edition, be adopted as the Clubs code; that the constitution be strictly adhered to in regard to applications for membership when qualifications were uncertain; that action be taken concerning all arrears and that the names of all members not complying with the constitution in this matter, after notification of such arrears, be struck off the list of membership. A letter was read from Mr. W. D. Wilcox urging the Club to take action towards preserving the natural beauty of those mountain places despoiled by tourists and others, and offering tangible assistance thereto. It was decided to bring the matter to the notice of the Dominion Government and to thank Mr. Wilcox for his kind offer. The sum of $50.00 was voted towards the library.

On February 2nd, in Calgary, the President reported on his series of lectures in the Clubs interest at Revelstoke, Vancouver and Victoria. A letter from Vancouver was read concerning the eligibility of educated Chinese for membership. It was agreed that the constitution did not forbid. In response to an appeal from Mr. Harrington Putnam, Vice-President of the American Alpine Club, for a contribution towards a fund for one of Miss Pecks disabled guides (a most pitiable, most worthy case), the sum of $25.00 was voted. At this meeting the offer was made and accepted of a loan of the $2,000 still required before it was possible to proceed with the Club House Building.

On March 8th, in Calgary, a letter was read from the Secretary for the Department of the Interior offering the Club water-rights at the Middle Spring, Banff, for an annual tax of five dollars. A stereopticon lantern was received and accepted with resolution of thanks, from Mrs. P. Burns. An offer of sectional book cases at a considerable discount for the Club House library was accepted. It was agreed to admit Subscribing members to the Club House camp during the season of 1909, at the rate of $3.00 per day.

On March 24th, in Calgary, the Executive was informed that the assistance of the President

and his survey party could not be afforded the Club at the General Camp of 1909, as heretofore. It was decided to use every effort to induce the Minister of the Interior to alter his decision.

The outstanding feature of the years business is the erection of a Club House at Banff, which, ere this report is in the hands of members, will be finished and occupied, giving permanent visibility to national mountaineering in Canada. The necessary funds have been provided in the form of debentures purchased by members; and, although, as a rule the response was generous, had one member not come forward with a loan of $2,000, the Club House would not have been built this year. This ought not to be. A more general distribution of the loan would have prevented the burden falling too heavily on one purse. Ten dollars each from the Clubs members, and there had been no such necessity. Special thanks are owing to Mrs. Wheeler, wife of the President, to Mrs. P. Burns and to Mrs. C. W. Rowley, Associate members, for their activities in superintending the furnishing of the Club House, as well as for their generous gifts; to Mr. George Vaux, Sr., and family, of Philadelphia, for their gift of the handsome fireplace in the assembly room, erected as a memorial to the late William S. Vaux, Jr., whose scientific studies of Canadian glaciers, in conjunction with his brother, George Vaux, Jr., have been so widely published and so greatly appreciated by the scientific world; and to all others who have helped with donations in money or in kind.

In February, by Act of the Alberta Legislature, the Club was incorporated under the legal name "The Alpine Club of Canada," with power to hold property to the value of $100,000, and to borrow money to the maximum of $25,000.

All legal work in connection with the preparation and passage of the Bill was a generous gift to the Club from Mr. Stanley L. Jones, of Calgary.

The Executive Committee is to be commended upon the appointment of Mr. S. H. Mitchell as permanent Executive Secretary, an official the overworked President could no longer do without.

Although in its youth, the Club has already a healthy offspring in two local organizations: the Mountaineering Club of British Columbia, with headquarters at Vancouver, whose name implies a field of operation covering the whole Province; and the Mountaineering Club of Revelstoke, whose activities will be confined mainly to the Selkirk and Gold Ranges and their glaciers in the same Province. Than the Selkirks there is no choicer mountaineering ground in Canada.

Among the social functions of the year were: banquets at Revelstoke and Vancouver, where Mr. and Mrs. Wheeler were guests of honor; a dinner at Winnipeg in honor of Mr. S. H. Mitchell; a reception to Toronto members at the house of Mr. and Mrs. Frank Yeigh; anniversary functions at Vancouver, Revelstoke, Calgary and Winnipeg; and other gatherings of a social sort, purely alpine.

It is the painful duty of the Secretary to make reference to the fatality occurring on Mt. Avalanche during last summers camp. While deeply regretting the death of the young lady and sympathising with her relatives, all members attending the camp of 1908, felt the warning profoundly. Utmost caution and obedience are necessary to safety, even on so-called easy mountains. And experienced mountaineers everywhere, urge upon new climbers the doctrine of vigilance, a doctrine they themselves have learned well.

Knowing the inconveniences suffered by the Hon. Treasurer and: the Executive Secretary, it is in the Secretarys heart and mind to urge upon all forgetful members the morality of promptness in paying their annual fees. For it is more than a question of courtesy, even one of ethics. Also, it would save much valuable time, stationery and postage, if persons intending to drop out of the Club would kindly notify the Executive Secretary of such intention.

Not least in the report are the acknowledgments due to the Canadian Pacific Railway for liberal concessions in rates, the loan of Swiss Guides, and kindly help from its various departments; to the Legislature of Alberta, for its ample contribution of $1,000 towards the expenses of the General Camp of 1909, and for the refund of the fee of $100, payable on the Incorporation of the Club; to Mr. E. H. Riley, M.P.P., for his able presentation of the Bill of Incorporation in the Alberta Legislature; to the Department of the Interior for permission granted to the President and Vice-President Bridgland to attend the coming camp and welcome the visitors from beyond the seas. We take it as a grateful sign that the enormous potentialities of the Canadian Alps are not unreckoned.

Though mountaineering is as wide as East and West, knowing in its essence no nationality nor bounds of kingdom or commonwealth; though one genuine mountaineer has a noble interest in common with every other genuine mountaineer, whatever his clime or nationality, there may be occasions when the Alpine Club of Canada will feel in its heart the tug of Empire. The visit this summer of veteran British climbers, members of the oldest and most distinguished Alpine Club in the world, is such an occasion, and our welcome has in it an element of national kinship. We hope this visit may became historic, in that it will initiate annual expeditions to the Rockies under the auspices of the mother of organized mountaineering.

One word more. During the past year there has been more climbing in the Rocky Mountains than ever before, and mainly by members of the Alpine Club; many living in the mountains, or not far off, climbing early and late in the season; and a prudent beginning has been made in winter climbing. The mountaineering impetus is felt in nearly every province of the Dominion, and an increasing number, who else would seek the populous Swiss Alps, are now turning towards the larger Alpine Playground of their own country.

Respectfully submitted,

Elizabeth Parker, Secretary.

Report Of Librarian.

The Club Library has now fifty-two volumes; only nine of these were received this year. At a meeting of the Executive Committee at Rogers Pass it was decided to apply for membership in the Champlain Society at ten dollars ($10.00) per year. This we were able to do and, by the payment of back fees, we secured the books published previous to this year. They are: Lescarbot, A History of New France, Vol. 1, by Grant and Biggar. The Description and Natural History of the Coast of North America (Acadia), Nicola Denys— translated by William F. Ganong, Ph.D.; and Documents Relating to the Seigneurial Tenure in Canada, by William Bennett Munroe, Ph.D., LL.B. The Champlain Society proposes to publish two works a year for the benefit of its members only. The books will never be put upon the market, and there will be no reprint. We have also subscribed to the University Magazine.

At an Executive meeting held in Calgary on December 15th, 1908, fifty dollars ($50.00) was voted for Library expenses. A portion of this has been expended.

We are indebted to Mr. Walter Dwight Wilcox for the gift of his revised work, “The Rockies of Canada,” which is of great interest to us, as it deals especially with the district around Lake Louise.

Mr. James Outram has made the Club a presentation of his book: “In the Heart of the Canadian Rockies,” a book dealing largely with what is still practically unknown country. The index is, on a small scale, an encyclopedia of the Canadian Rockies as now known to the alpinist.

The Hon. Frank Oliver, Minister of the Interior, has presented the Club with a copy of "The Atlas of Canada," than which no gift could be more useful or acceptable.

"The Matterhorn," by Guido Rey, has been acquired by purchase.

The Hon. Secretary has presented the Club with a little book called "Stickeen," a description of the Alaskan Glaciers, by John Muir, for whom the great Muir Glacier was called.

Mr. F. W. Freeborn has kindly given the Club Library a copy of "Some Adirondack Paths," written by himself and furnished with maps; a most valuable handbook for wanderers among those hills.

New Exchanges have been made with "The National Geographic Society, French Alpine Club, Swiss Alpine Club, Austrian Alpine Club, The Alpine Club of Japan, Societe des Touristes du Dauphine, Smithsonian Institute and the Rock and Fell Climbing Club. We are indebted to the French Alpine Club for its kindness in sending us files of their journal, La Montagne, published monthly, dating from January, 1906, until the present date. In exchange for our journal, F. W. Faxon, editor of the Annual Magazine Subject Index for 1908, has listed the Journal in that Index.

The following is a catalogue of books, exchanges and publications in the Library of the Alpine Club of Canada:—

CATALOGUE.	**PRESENTED BY**
The Selkirk Range, Vols. 1 and II.....A. O. Wheeler.	A. O. Wheeler
Mountaineering..... Dent.	S. H. Mitchell
The House on Sport.....Composite Authorship.	" "
From Old to New Westminster.....Sir Sandford Fleming.	Sir S. Fleming

CATALOGUE.	**PRESENTED BY**
Climbing in the Himalayas .....J. Norman Collie.	Dr. Collie
Climbs and Explorations in the Canadian Rockies .....Collie and Stutfield.	"
Ascent of Mt St. Elias..... Filippo de Filippi.	Tom Wilson
Voyages et Aventures dans Alaska. .....Frederick Whymper.	" "
The Land of Cliff Dwellers.....Frederick Chapin.	" "
Mountaineering in Colorado..... Frederick Chapin.	" "
Chamonix and Mt. Blanc..... Edward Whymper.	Edward Whymper
A Guide to Zermatt and the Matterhorn ...Edward Whymper.	" "
Camp-fires in the Canadian Rockies.....Hornaday and Phillips.	Mrs. Parker
Glaciers of the Alps.....Tyndall.	" "
The Playground of Europe.....Sir Leslie Stephen..	" "
The Alps from End to End.....Sir Martin Conway.	" "
Stickeen .....John Muir.	" "
Glaciers of the Canadian Rockies and Selkirks .....W. H. Sherzer.	Dr. Sherzer
Mountain Wild Flowers of Canada.....Julia W. Henshaw.	Mrs. Henshaw

CATALOGUE.		**PRESENTED BY**
Alpine Flora of the Canadian Rocky Mountains	..... Stewardson-Brown and Schäffer.	Mrs. Chas. Schäffer
Among the Selkirk Glaciers.....	W. Spottswood Green.	Ferdinand Meinecke
California and Alaska, and over the Canadian Pacific Railway	.....William Seward Webb.	W. T. Robson
Siberia.....	Samuel Turner.	Samuel Turner
Appalachia, Vols. VII, VIII, IX and X..		By Purchase
A Trip Round the World, Vols. I and II.....	Sir George Simpson.	" "
Wanderings of An Artist.....	Paul Kane.	" "
Mission de 1Oregon.....	De Smet.	" "
Saskatchewan and the Rocky Mountains, 1875	..... Southesk.	" "
Astoria, 1836	Washington Irving.	" "
The Northwest Passage by Land, 1863.....	Milton and Cheadle.	" "
Impressions of a Tenderfoot, 1890.....	St. Maur.	" "
The Columbia River, Vols. I and II, 1832...	Ross Cox.	" "
The Solitary Hunter, 1859.....	Palliser.	"
Camps in the Rockies, 1883.....	Baillie-Grohman.	" "
Mountain and Prairie, 1880.	Daniel M. Gordon.	" "
The Great Lone Land.....	Butler.	
A Voyage Through North America, 1801..	Alexander Mackenzie.	
The Matterhorn.	Guido Rey.	" "
A History of New France, Lescarbot, Vol. I	.....Grant and Biggar.	" "
The Description and Natural History of the Coast of North America (Acadia), Nicola Denys, translated by.....	William F. Ganong, Ph.D.	"
The Documents Relating to the Seigneurial Tenure of Canada,	.....Wm. Bennett Munroe, Ph.D., LL.B.	"

The Rockies of Canada.....	Walter D. Wilcox.	Walter D. Wilcox
In the Heart of the Canadian Rockies		James Outram
The Atlas of Canada	.....The Department of the Interior.	Hon. Frank Oliver
Some Adirondack Paths….....	F. W. Freeborn.	F. W. Freeborn

EXCHANGES.

Alpina Americana.
Sierra Bulletin. Alpine Journal.
The Mountaineers.
Scottish Mountaineering
Club Journal. La Montagne.
Smithsonian Institute Magazines.
Journal of the National Goegraphic

Society. Annual Magazine Subject Index.
L'Echo des Alpes.
Annual of the Dauphine Tourist Society.
Journal of the Austrian Alpine Club.
Journal of the Alpine Club of Japan.

PUBLICATIONS.
Modern Glaciers ..... Wm. S. Vaux
The Great Glaciers of the Illecillewaet.. . Geo. and Wm. S. Vaux
Glacial Studies in the Canadian Rockies and Selkirks...
W. H. Sherzer
University Magazine.
Rod and Gun in Canada.

Respectfully submitted,

April 12th, 1909.

Jean Parker, Librarian.

Report Of 1908 Camp.

The third Annual Camp of the Alpine Club of Canada was pitched directly upon the summit of the Rogers Pass, at an altitude of 4,350 feet above sea level. The site was not an ideal one in some respects, but none other was available. Sites that will admit of camps on so extensive a scale are scarce in the narrow, thickly-timbered valleys of the Selkirks, where the bottoms are filled by rushing torrents, often confined between rock walls. Although the picturesque groups of spruce of the Yoho Camp, and the forest glade and rushing torrent of Paradise Valley Camp were missing, there was plenty of room, and the very contrast of the scene to that of previous years proved an attraction; while the towering heights of :Mt. Rogers, the Swiss Peaks, Hermit Mountain and Mt. Tupper at one end of the pass, and the distant snow-fields and glaciers of the Asulkan, showing between the pyramids of Cheops and Avalanche, at the other, presented a wide-spreading reach of magnificent alpine scenery that was not to be had from the immediate site of either of the preceding camps.

Though a number of mountain streams were in the near vicinity, there was no water directly at the camp. The difficulty was overcome by the ingenuity of Mr. J. P. Forde, resident engineer for the mountain division of the Canadian Pacific Railway. Directly in front of the camp lay a snow-shed some half a mile in length. Along its top ran a line of water piping to convey a supply in case the shed should catch fire from a spark from an engine, a bush fire, or any other cause; for shed building is very costly and fire a serious menace. It took a gang of railway men about two hours to lay a line of piping to each of the various quarters of the camp, and some modern taps were in use in three different places, providing cold water in the early morning and hot water during the day when the sun was shining, owing to the heating of the piping on the roof of the shed. A small but clear and ice-cold spring supplied the camp with drinking water.

A feature of the camp for the third year was that with the exception of two tents loaned

by Mr. Forde, we were under our own canvas, and it requires quite a lot to house and provide comfortably for two hundred persons, the number for which preparation had been made.

Owing to the fact that the grade of the railway line on the approach to, and over, the pass was being changed, several camps of foreign workmen were close at hand, and it was thought advisable to have, two special constables on duty. It is pleasing to relate that no greater demand was made upon their authority than to keep the big campfire well supplied with fuel and to watch the tents and awnings and tighten the guy ropes when necessary. The foreigners—Japanese Coolies—attended strictly to their own business and nothing was seen of them.

The weather while camp was being pitched was very bad, but before the arrival of the visitors, cleared up and, for the Selkirks at that season, was generally fine, only one really wet day and a few minor showers being experienced.

The camp opened officially on July 7th and closed on July 16th. A number of members came a day or two earlier and assisted in pitching and brushing the tents, erecting flag-poles, and generally getting things in order. When all was finished the view from the top of the snow-shed was an imposing one. On a level dip in the centre was the dining pavilion, an awning erected on a scaffolding of poles, a new one, large enough to cover the entire assemblage, including the dining tables and cook tents, the ladies tea tent, the official notice board, the post office, and still leave room for all to gather during the storms. Beyond it in the same dip, arranged in symmetrical order, were the camp fire—the altar of worship where the fire never quenched during the period of devotion to the white peaks surrounding it—the presidents and secretary's official tents, the art exhibit tent, and behind, on the hill-side, the scattered tents of the various officials and retainers of the camp work, and of those who had brought their own canvas. On either side, on gently rising slopes, were the Ladies' and Gentlemen's quarters, groups of white bell tents set in commanding positions.

The attendance was the greatest that had yet been experienced, one hundred and seventy-seven persons being placed under canvas. This number represented a very considerable section of the globe, the distribution being as follows: In Canada: BRITISH COLUMBIA—Armstrong, Cranbrook, Glacier, Golden, Greenwood, Kelowna, New Westminster, Revel-stoke, Rossland, Vancouver, Vernon. ALBERTA — Banff, Bawlf, Calgary, Edmonton, Hardisty, Lacombe, Leduc, Lethbridge, Medicine Hat, Millarville, Morley. SASKATCHEWAN

—Nokomis, Yellowgrass. MANITOBA—Portage la Prairie, Winnipeg. ONTARIO—Elmvale, Ottawa, Port Hope, Toronto, Waterford, Woodstock. QUEBEC—Montreal.

From the United States of America: CALIFORNIA—Berkeley. ILLINOIS—Chicago, Galesburg. MASSACHUSETTS

— Boston, Tufts College. MINNESOTA—Minneapolis. NEW YORK—New York, Rochester. OREGON—Portland. RHODE ISLAND—Warren.

From over seas: ENGLAND—Bristol, Buckhurst Hill, Sheffield. HOLLAND —Rotterdam. SWITZERLAND —Interlaken.

Representatives from the following Alpine Clubs were our guests: The Alpine Club of England, the American Alpine Club, the Netherlands Alpine Club, the Appalachian Mountain Club, and the Mazamas of Portland, Oregon.

The following messages of greeting were received:

From Sir Sandford Fleming, Hon. President: " On behalf of the first Canadian Alpine Club, an old memorial of the watershed of the Selkirks, I send, after an interval of twenty-five

years, cordial and kindly greetings to the new Alpine Club now assembled in the same

locality. May every member return home with renewed health and only pleasant memories of the everlasting Selkirk mountains."

From J. D. Patterson, Vice-President: "I sincerely hope good work may be done from the camp in the Selkirks. Most sorry I cannot attend. Greetings and good luck to all of you."

The accompanying graphic reply to an invitation to be the Clubs guest was received from Sir William Van Home.

Kindly greetings were also received from the Right Hon. James Bryce, British Ambassador at Washington, U.S.A., Mr. Edward Whymper, the Alpine Club of the Netherlands, the Mazamas of Portland, Oregon, and many others.

The third annual general meeting was held under the pavilion, the principal business being the election of officers to serve for the second term of the Clubs existence. Other important business was transacted, chief among which was the decision to build a suitable Club House headquarters at Banff and to raise the money required by the issue of Club debentures to the extent of six thousand dollars. The result of such action is, at the time of writing this report, embodied by a handsome building which stands forth picturesquely against the pines on the side of Sulphur Mountain, one of the most prominent features of the capital of the National Rocky Mountain Park, and a fitting symbol of the earnestness with which Canadians have taken up alpinism in their own snow-clad ranges of mountains.

Assistance was again given by the Dominion Government, by the Government of Alberta, and by the Canadian Pacific Railway. To the last mentioned especially are we indebted for the loan of two Swiss guides for the period of the camp. Three Swiss guides and one Swiss porter were in attendance, but for the use of the third guide the railway company received payment at the regular tariff rate.

Taken as a whole, the camp was the busiest and most enthusiastic yet held, and the attendance exceeded all previous years.

Report Of Chief Mountaineer.

The mountaineering staff of the General Camp was practically the same as in previous years: M. P. Bridgland in charge, assisted by H. G. Wheeler and E. O. Wheeler. The two Swiss guides, Edouard Feuz, Jr., and Gottfried Feuz, of Interlaken were again loaned to the Club by the Manager-in-chief of the hotel system, Mr. Hayter Reed. In addition, a third guide, the veteran Edouard Feuz, Sr., was hired by the Club at the usual tariff rate of the company. A Swiss porter also was hired by the Club. A number of the Clubs members rendered valuable assistance on the various climbs and expeditions, notably P. D. McTavish, J. P. Forde, Rev. J. R. Robertson, D. N. McTavish and Rev. A. M. Gordon.

The official graduating climbs were Rogers Peak of Mt. Rogers (10,536) and Mt. Hermit (10,194). It is possible to make either of these peaks and return in one day from the site of the Camp, but it was considered too strenuous for those who were making graduating climbs; consequently arrangements were made to spend a night at the hut at timber-line on Mt. Rogers, and tents were placed close by to accommodate the overflow from the hut.

In all, fifty-seven graduated to Active membership at follows:

ON MT. ROGERS.

July 7th.

Thurlow, Rev. Fraser.
Gutsell, R. L.
Hamilton, W. G.
Webber, F. G.
Patteson, T. E.
Patteson, Miss A. E.
Farran, F. St. C.
Forrester, D.
Smith, W. N.
Ford, A. K.
Huffman, J. C.
Main, Rev. C. O.
Garrow, Miss.
Burwash, Rev. E. M.

July llth.

Macdonnell, Rev. Logie.
Macdonnell, Mrs. Logie.
Rogers, R. H.
Thompson, W. H.
Dowler, F. A.
Reikie, K. W.
Reikie, Rev. T. T.
Miller, A. E.
Logan, Capt. J. J.
Logan, Mrs. J. J.
Copeland, R. R.
Humphrys, E.
Parslow, Miss B. L.
Hood, R. B.
Stanton, Miss.
Mitchell, C. H.
Cooke, J. R.N.
Culp, N.

July 12th.

Haggen, G. L.
Muckleston, Miss.
Pollock, J. T. D.
Buchanan, F. G.
Taylor, E. L. T.

Greenway, Miss C. M.
Greenway, Miss Grace.
Alexander, J. H.
Morrison, T.
McCoubrey, A. A.
LeFeuvre, Miss E.

July 13th.

Foote, Miss S. L.
Maus, Miss D. M.
MacKay, Miss M. A.
MacKay, Miss J. C.
Morrison, Miss A. M.
MacFarlane, Miss G.
Tansley, H.
Reading, A. L.
Robins, K. N.

ON MT. HERMIT.

July 12th.

Richardson, C. A.

ON SIR DONALD.

July 8th.

Gordon, C. J. M.

ON MT. STEPHEN.

July 16th.

Crawford, Dr. Mary
Patterson, Miss Jean
Halstead, John.

ROGERS PEAK. (10,536 ft.)

To make the ascent of Rogers Peak, the party would leave the camp the previous day either shortly before or after noon and spend the night at the hut at timber-line. The hut could be reached from the camp easily in from three to four hours. The trail leading up to it is somewhat steep, but presents many magnificent view points. Owing to the date of the camp being early for the Selkirks, the trail was wet and the frequent travel of the ponies to and fro made the trail in very bad condition. The ground surrounding the hut and camp also was none too dry and generally the comfort available was not so great as it would have been later in the year. A cook was stationed at the camp and notwithstanding the drawbacks every one was cheerful and had a most enthusiastic and enjoyable time. The ascent was generally made by the southern arête. It presents a nearly

even mixture of rock and snow work and usually took from four to five hours from the hut camp. The return was made down the southern face of the mountain and presented a series of most exhilarating glissades and a trip across Swiss Névé. While no particular difficulties or dangers were involved the climb was of quite sufficient magnitude to test the courage and perseverance of those attempting it and to entitle the graduates to the degree of Active membership.

At night the camp fire at the hut could be seen from the main camp gleaming high up on the side of the mountain, and daily between 9 a.m. and 10 a.m. many field glasses at headquarters were keenly on the watch to discern the tiny figures of those who had achieved the summit, silhouetted against the sky.

MT. HERMIT. (10,194 ft.)

In contrast with Mt. Rogers, Mt. Hermit is distinctly a rock climb and a very interesting one. Its base is reached most easily by an ascent of Rogers Glacier and a tramp across the Tupper Névé. In addition to some splendid rock work, it presents one of the finest views of the entire range.

MT. SIR DONALD. (10,808 ft.)

It was early in the season for this mountain and the snow was in a dangerous condition for avalanching. Notwithstanding, two ascents were made under the guidance of Edouard Feuz, Sr. On the second of these ascents the newly discovered chimney was used, by which the couloir of the falling stones can be avoided. There were many applicants for this climb, but owing to the condition of the mountain only the best men were allowed to undertake it.

MT. AVALANCHE.
(9,387 ft.)

This is but a low and easy peak directly south of the camp across the railway track. An ascent was arranged the second day after the camp opened, more for the purpose of training than any other. No one would have even suggested the possibility of the sad tragedy that occurred, resulting in the death of Miss Helen Hatch, of Lethbridge, Alberta.

No climbs other than those named were made at the time of the camp, owing to the large number of graduating members and the fact that the qualifying climbs required two days and compelled three of the best guides to remain at the Rogers hut; also to the necessity for calling in all guides to recover the body after the accident. Immediately subsequent to the camp, however, several others were made by parties of members who had been present; notably, Mt. Tupper, of which an account is given in this number of the Journal. Mt. Stephen also was climbed by a party under P. D. and D. N. McTavish, and on this occasion several graduating members qualified who had been crowded out at the general camp. A record of the climb will be found in the Alpine Notes.

M. P. Bridgland, Chief Mountaineer.

EXPEDITIONS.

Apart from actual mountain ascents there were a number of daily expeditions all of which were patronized.

Probably that of greatest interest was up the Asulkan Valley, where an auxiliary camp was set with a man in charge to look after the cooking, camp fires, etc. The tents were placed in the

woods not far from the foot of the glacier, and from this point three separate expeditions radiated.

The easiest and most popular was that up the glacier, and across the snowfield to the summit of the Asulkan Pass, to get a glimpse of the snow giants of the Dawson, Bishops and Purity Ranges, lying beyond the deep trough of the Geikie Glacier, flowing 2,800 feet below the pass.

The second expedition followed the same route, but before reaching the pass turned to the left and ascended the Snow Dome of the Asulkan. It then traversed the ridge for some distance and descending to the Illecillewaet Névé returned to the main camp via the Illecillewaet Glacier.

A third expedition turned to the right from the Asulkan Névé and climbing to Sapphire Col traversed the Dome, the Rampart, Mts. Afton and Abbot and descended to Glacier House via Marion Lake. This was a somewhat arduous piece of work and was only made the once. Two of the party were ladies, the Misses Adams and Springate, of Winnipeg. Glacier House was not reached until long after dark.

ILLECILLEWAET NÉVÉ.

Another expedition consisted of a visit to the Illecillewaet Glacier and Névé. It was in charge of Edouard Feuz, Sr., and proved most popular owing to the reputation of the guide. The characteristic features of the icefall, its séracs, moulins and crevasses were pointed out, and a climb made to Perley Rock and to the névé perched on a bold rock escarpment five thousand feet above the Beaver River, winding a silver thread in the valley below. The magnificent view of the endless pyramids, towers and domes, snowfields and icefalls of the Spillimacheen and Dog-Tooth Mountains from this point of vantage was alone worth the labor.

THE SELKIRK CAVES.

A daily expedition left the main camp for the Caves. They are situated in Cougar Valley at a distance of about eight miles from Rogers Pass summit.

Two routes were available; the easiest by pony trail, via the Loop and Lower Cougar Creek Valley; the more strenuous, on foot, via the upper waters of Bear Creek and Baloo Pass. This last, owing to the high stage of the streams, was full of adventure and rendered the stalwart of the Club gloriously happy.

A camp had been established at the Caves with a cook in charge. The log cabin erected by the Government furnished sleeping quarters. Unfortunately, the time of the year was too early for an entry to the largest series of the caves, the Gorge series, owing to Cougar Creek, which flows through them, being at flood. The caretaker, however, took the several parties to the Gopher Bridge and Mill Bridge series, each, of which has its own striking characteristics; the former of close proximity to a rushing underground torrent and a spectacular magnesian light view of a subterranean waterfall, and the latter, a series of carved circular potholes, descending, pocket by pocket, to a large chamber, named the Auditorium; also of twisting, tortuous passages winding in the marbelized limestone.

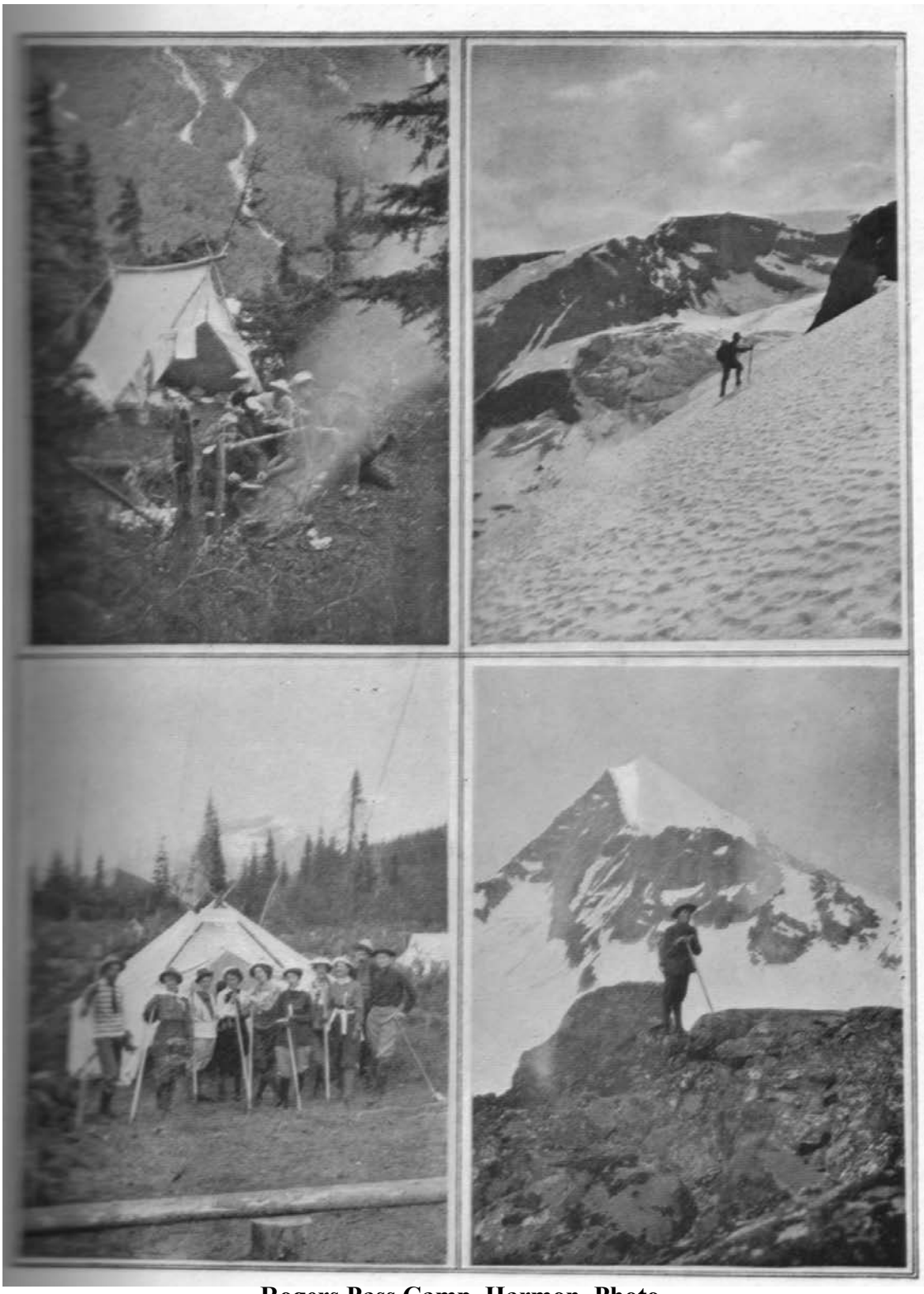
The hanging valley of the upper Cougar is alone worth the visit. It is a typical glacier-lined valley, surrounded by sharp, snow-clad peaks and black overhanging cliffs. There is rushing water everywhere, and the valley bottom and lower slopes are carpeted with heath and heather, and mountain flowers of varied brilliant hues are seen on all sides. The calls of the hoary marmot and little Chief hare break the solitude, and high up on the mountain sides flocks of goat browse on the grassy tufts or wend in single file across the snowfields. Here also, among the fallen masses of rock debris, is a favorite haunt of the Grizzly, and they are often seen by the more inquiring visitors.

Montreal 25th May
1908

513 SHERBROOKE STREET WEST

Sir William Van Horne regrets
that he is unable to accept
the kind invitation of the
Alpine Club of Canada to
be the guest of the Club
at its Third Annual Camp
at Rogers Pass from the 7th
to the 15th July.
Aside from the consideration
of engagements which

stand in
his way
he feels that, for obvious reasons,
he would not shine on such
an occasion.



Rogers Pass Camp. Harmon, Photo.

MINOR EXPEDITIONS.

For those who did not desire strenuous work a number of expeditions were organized daily, including the usual short tramps from Glacier House, viz: To the Illecillewaet icefall, to Marion Lake and Observation Point to Cascade Summerhouse, Avalanche Crest, Glacier Crest, the Loop and a number of others. Many of these could be made or partly made with saddle ponies and thus reduced to the least possible exertion. A full supply of saddle ponies were always on hand.

The Accident On Mount Avalanche.

It happened on Wednesday, the 8th July, the day after the official opening of the Camp. Among the parties sent out that day was one to make the ascent of Mt. Avalanche by the north-west face. The party was composed as follows: E. Oliver Wheeler, of the camp staff of guides in charge; P. D. McTavish, one of the Clubs best men, assisting; the Rev. Alex. M. Gordon, also one of the Clubs experienced men; G. E. Howard, the English Alpine Clubs representative, who had had experience of mountain climbing in Switzerland; A. H. Ford, of Minneapolis, a novice; Miss E. M. Parslow, of Calgary and Miss Helen Hatch, of Lethbridge, both of whom had made climbs previously, the former at the Paradise Valley Camp of 1907. and the latter of Crows Nest Mountain in the spring of 1908.

Shortly after luncheon one of the boys—scouts we call them—came to me and said Mr. P. D. McTavish wished to see me in Tent No. 1. For a moment I did not grasp the import of the message and then I realized that something dreadful had happened. I found Mr. McTavish in a state of complete prostration and unable to articulate more than the words: “It has happened.” “Oh! it has happened!” The nervous shock combined with his very rapid descent of the mountain had left him almost devoid of power to speak, and I feared for a few minutes that all the party except himself had been killed. Gradually I drew from him the fact that Miss Helen Hatch alone had fallen. His statement, in substance, was as follows: The party commenced the ascent directly opposite the camp and had reached the summit of an outlying spur, scarcely above timber-line.

The ground was still covered with grass and heather and small brush, the last vestiges of timber growth were scattered here and there, with outcrops and ledges of rock showing in places. It was necessary to descend from this shoulder to a snow-filled couloir leading to an amphitheatre, also filled with snow, across which rose the main peak of the mountain, where the real climbing commenced. We had begun the descent but were not roped, as no necessity had as yet arisen for such a precaution. Coming to a patch of snow, Oliver turned to Miss Hatch, who was next him, and said: “Wait a minute until I get down and see if it is all right, you may have to go round.” He then started to glissade downwards. As he started, Miss Hatch, full of the exhilaration of the climb and ignorant of danger, called, “I am coming. Look out!” and, taking a little run, shot down the snow, lost her footing and, as Oliver reached the bottom, went by him with tremendous velocity. Hearing her call he checked himself, turned swiftly and grabbed for her. Alas! she had gone wide and he only touched her outstretched hand. She passed on down the slope from ledge to ledge, gathering velocity as she fell and, at a depth of 120 feet, dropped over the final ledge, twenty feet perpendicular, to the snow-filled couloir. She had not uttered a sound and must have fainted the moment she realized what had happened. On reaching the couloir she slid rapidly down its surface. Had she continued down the full length of it and of the wider depression which lay beyond, she

might not have lost her life, but alas! the snow stratum on which she had fallen curved inwards to the cliff and she dashed head-first into a projecting spur of rock, where the body came to rest. The moment it was realized that she was falling, Oliver and McTavish dashed down the slope, arriving at the perpendicular edge almost as the body dropped over. This fact alone would show that the place was not a dangerous one from a mountaineering point of view.

Having obtained from Mr. McTavish the facts as fully as he could relate them, I immediately sent a messenger post haste to the Rogers hut to bring down the two Swiss guides, Edouard and Gottfried Feuz, the moment they should return from that days ascent of Rogers Peak. I also sent a messenger to bring Edouard Feuz, Sr., from Glacier as soon as he returned from his expedition. Then, having given full instructions for a party to ascend the mountain at day-break to bring down the body, I got some provisions and a rope in a rucksack, and, taking one man, ascended to find the members of the party who had stayed at the scene of the accident.

We struck the northern precipitous side of the deep depression or ravine leading from the amphitheatre above referred to by Mr. McTavish, into which the snow couloir led. We could see below several figures standing around a dark object on the snow near where it ended at a great boss of rock in the middle of the ravine. From their location we gathered that the work of bringing down the body had already been begun. We shouted and descended the precipice rapidly to the snow. Crossing this we soon came to where the tracks showed plainly. Now sending my companion down to the party below, I waited while the Rev. Mr. Gordon joined me and, accompanied by him, followed the trail, foot by foot, to the spot where Miss Hatch first jumped on the snow. My examination, a minute one, verified almost absolutely Mr. McTavish's statement, and I realized with the most intense sorrow that a charming and plucky young life had been thrown away owing to a moment of impetuosity.

Returning to the group below, I found that Oliver, Miss Parslow and Mr. Howard had returned to the camp, leaving Mr. Gordon and Mr. Ford in charge. A rude litter had already been made and now by its aid we carried the body to timber-line and covering it carefully with balsam bush, built a fire close by and prepared to wait for the party coming up. It rained steadily all night, but a canvas covering 1 had brought up furnished some protection. Shortly after daybreak a shout from the cliffs notified us that the expected party was close at hand, and soon its members came over the snow towards us on the run. Among them were the three Swiss guides, Geoffrey Howard, the plucky Englishman, who only the day before had been present when the accident occurred, Manuel Dainard and Closson Otto, two of the oldest outfitter guides in the mountains, and a number of volunteers from the members at the camp. A suitable litter was rapidly constructed and the light weight supported by willing arms was carried on burly shoulders down the steep slopes of the mountain. At the track the section men were waiting with a hand-car and the sad and dripping little cortege, for it was raining heavily, wound its way slowly to Glacier House. In the meantime the coroner for the district had been summoned to Glacier and a searching inquiry resulted in the release of the body for burial.

It will very reasonably be asked: "Was the young man who had charge of the party a competent guide?" I can only say that my son has been my companion in mountain climbing since he was ten years of age. I have frequently been with him in places of considerable difficulty and danger and have always found him cool, clearheaded and capable. I have the fullest confidence in his ability. His party was not roped, but even the Swiss guides at Glacier, who are models of precaution, stated that none would have dreamed of using a rope on the ground where the accident happened.

Statement Of Treasurer

From May 22nd , 1908 to June 30, 1909

Receipts

Balance on hand, May 22nd, 1908		$542.18
Fees - Associate members	$351.50	
Active members	1273.35	
Graduating members	309.00	
Subscribing members	78.25	
Life members	200.00	
		$2212.10
Sale of stationary		10.90
Interest on General Account		18.64
Ice Axes Prepaid		85.15
Photographs		9.00
Sale of Journals and Camp Balance		411.29
Camp, 1908		2380.61
Sale of Club Ribbon		1.00
Alberta Government, Incorporation Fee Returned		100.00
Alberta Government, Grant to 1909 Camp		1000.00
Revelstoke Mountaineering Club to 1909 Camp		500.00
Total		$7270.87

Disbursements

Printing and Stationary	$ 273.67
Postage, Express, etc	298.15
Library	74.48
Wages	665.50
Publishing Journal	931.65
Camp Account, 1908	2380.61
Camp Account, 1909	432.35
Ice Axes, etc	180.00
Travelling Expenses, Banff and Edmonton	30.40
Alberta Government, Fee for Incorporation	100.00
Graduating Fee overpaid, refunded	5.00
American Alpine Guide, Grant to disabled guide	25.00
Club Ribbon	21.95
Insurance - Hornibrook & Whittemore	12.00
Balance	$1840.21
Total	$7270.87

Unpaid Fees

Fees unpaid to date	$1022.00

C.W. Rowley, Hon. Treas.

RECEIPTS AND EXPENDITURES, ROGERS PASS CAMP, 1908.

Receipts.

Grant, Alberta Government	500.00
Board and Accommodation	1,504.00
Sales, Ice Axes and Sundries	194.25
Baggage, Hire of Ponies	41.35
Employees Fund Collected	122.85
Fees—A. B. Ballentine	5.50
	$2,367.95

Expenditures.

Provisions	$586.14
Wages	272.95
Outfit, Tents, etc.	377.34
Freight and Express	99.86
Horses	400.00
Stationery, Printing, Telegrams	40.40
Ice, Axes, etc.	184.07
Bonus to Employees	138.00
Smoked Glasses, A. B. Ballentine	5.50
Balance to Canadian Alpine Journal	263.69
	$2,367.95

C. W. ROWLEY, Hon. Treas.

BANFF CLUB HOUSE BUILDING FUND.

Synopsis.

Receipts.

Subscriptions Fully paid up	$3,666.98
Subscriptions Partially paid up	60.15
Proceeds of Lectures by President	88.25
Interest	27.54
	$3,842.92

Disbursements.

Sundry Cheques on Club House Building Contracts...	$3,371.89
Balance in Hand	471.03
	$3,842.92

C. W. ROWLEY, Hon. Treas.

BANFF CLUB HOUSE BUILDING FUND.

Subscriptions Paid in Full.

Miss C. E. Adams	$10.00
F C. Brown	20.00
S. H. Baker	10.00
E. M. Burwash	20.00

A. B. Ballentine	20.00
M. P. Bridgland	30.00
J. R. N. Cooke	20.00
P. A. Carson	50.00
B. S. Comstock	20.00
R. R. Copeland	10.30
P. M. Campbell	20.00
H. N. Cowdry	10.00
E. V. Cowdry	10.00
Dr. Mary Crawford	10.00
Miss E. G. Crawford	40.00
H. S. Craig	40.00
Prof. A. P. Coleman	10.00
Paul D. Cravath	20.00
F. A. Dowler	10.00
Miss M. T. Durham	.10.00
Prof. H. B. Dixon	50.00
G. Darling	20.00
A. C. Davy	10.00
L. L. Delafield	50.00
E. L. Drewry	50.00
F. W. Freeborn	61.00
Miss E. J. Freeborn	9.90
Don. Forrester	50.25
J. P. Forde	20.00
F. St. C. Farran	10.00
Rev. Thurlow Fraser	20.00
Miss S. L. Foote	10.00
Miss F. M. Field	10.00
W. W. Foster	20.00
Miss A. Finlayson	10.00
Miss A. J. Garrow	20.00
R. L. Outsell	20.00
Miss J. A. Gibson	10.00
C. H. Gillis	200.00
T. H. Graham	20.00
Rev. C. W. Gordon, D.D.	30.00
Malcolm Goddard	10.00
Rodney L. Glisan	50.00
G. E. Howard	250.00
Miss E. B. Hobbs	20.00
A. R. Hart	30.00
W. G. Hamilton	20.00
Dr. J. W. A. Hickson	20.25
Miss M. Holditch	10.00

John Halstead	20 00
A. H. Hartevelt	25 00
G. L. Haggen	20.00
Miss A. Hutchinson	10.00
Mrs. Henshaw	10.00
Stanley L. Jones	60.00
Mrs. Jardine	10.00
Walter Bews	20.00
D N. McTavish	50.00
1 J. Logan	50.25
J W. Ladler	10.00
S H. Mitchell	70.13
C. R. Merrill	10.00
C. H. Mitchell	20.00
Miss Amy Morrison	10.00
J G. Milloy	40.00
J. B. McLaren	20.00
K. D. McClelland	20.00
W. C. McKillican	30.00
H. W. McLean	20.00
Miss J. C. MacKay	10.00
Miss M. A. MacKay	10.00
Miss G. MacFarlane	10.0C
Miss M. Macfarlane	10.00
A. M. McCoubrey	20.00
Miss K. McLennan	10.00
F. M. Nicholson	10.00
H. J. Palmer	30.00
Mrs. H. J. Palmer	20.00
Howard Palmer	29.90
Mrs. H. J. Parker	20.00
Miss Jean Parker	20.00
Miss Jean Patterson	20.00
J. D. Patterson	250.00
Prof. H. C. Parker	50.00
R. E. Plewman	20.00
Miss J. M. Port	20.00
Jas. F. Porter	20.00
C. W. Rowley	50.00
Rev. J. R. Robertson	10.00
Rev. T. T. Reikie	10.00
R. H. Rogers	10.0C
G. O. Rogers	10.00
K. C. Radford	10.00
K. N. Robins	30.00

J. A. Reid	50.00
C. B. Reilly	20.00
A. J. Sayre	50.00
B. S. Smith	50.00
W. N. Smith	20.00
Miss E. C. Smith	10.00
Miss A. M. Stewart	20.00
Miss M. Springate	10.00
Miss R. G. Stanton	10.00
Miss J. L. Sherman	50.00
B. F. Seaver	10.00
J. N. H. Slee	50.00
E. L. T. Taylor	50.00
W. H. Thompson	20.00
A. O. Wheeler	250.00
John Watt	50.00
W. J. S. Walker	100.00
F. G. Webber	10.00
H. H. Worsfold	10.00
D. Warner	50.00
Miss H. Watson	20.00
Wm. Whyte	30.00
Total	$3,666.98

Subscriptions Partially Paid.

C. H. Copeland	$10.00
C. A. Richardson	2.50
J. H. Alexander	12.50
Miss Creech	5.00
J. C. Huffman	7.50
Rev. C. O. Main	5.00
A. L. Reading	5.00
F. Yeigh	10.15
G. O. Rogers	2.50
Total	$60.00

Subscriptions Outstanding.

Unpaid.....	$255.00

C. W. ROWLEY, Hon. Treas.