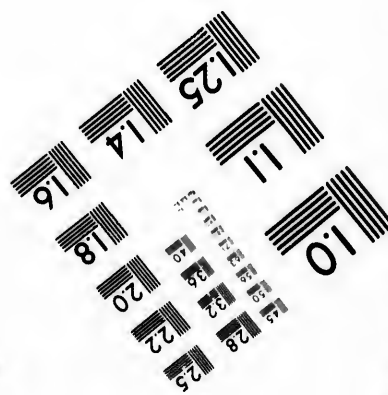
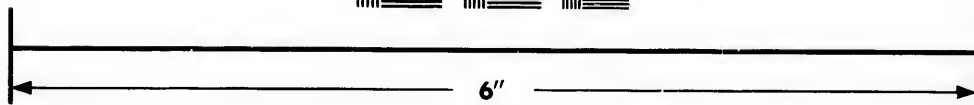
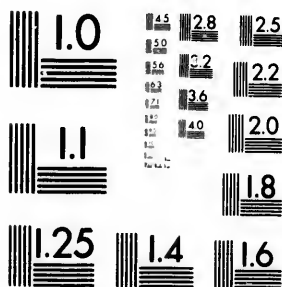


**IMAGE EVALUATION
TEST TARGET (MT-3)**



**Photographic
Sciences
Corporation**

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

15 28
16 32
18 22
20 25

**CIHM/ICMH
Microfiche
Series.**

**CIHM/ICMH
Collection de
microfiches.**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

10
15

© 1981

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured covers/
Couverture de couleur
- Covers damaged/
Couverture endommagée
- Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée
- Cover title missing/
Le titre de couverture manque
- Coloured maps/
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur
- Bound with other material/
Relié avec d'autres documents
- Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distortion le long de la marge intérieure
- Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- Additional comments:/
Commentaires supplémentaires:

- Coloured pages/
Pages de couleur
- Pages damaged/
Pages endommagées
- Pages restored and/or laminated/
Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées
- Pages detached/
Pages détachées
- Showthrough/
Transparence
- Quality of print varies/
Qualité inégale de l'impression
- Includes supplementary material/
Comprend du matériel supplémentaire
- Only edition available/
Seule édition disponible
- Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/
Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	14X	18X	22X	26X	30X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X

The copy filmed here has been reproduced thanks to the generosity of:

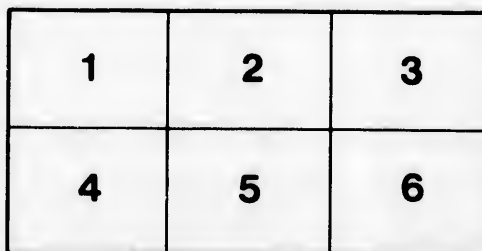
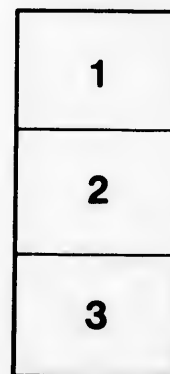
Library Division
Provincial Archives of British Columbia

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol \rightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

Library Division
Provincial Archives of British Columbia

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \rightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

ails
du
ndifier
une
nage

rata
o
elure,
à

nwp
971.21
H113

THE
NORTH FORK VALLEY OF THE WAPTA
(BRITISH COLUMBIA)

By JEAN HABEL

Extracted from APPALACHIA, VIII, 4, March, 1898

10-2-41

7
C

Map
971-21
H113



The North Fork of the Wapta.

BY JEAN HABEL.

Read January 19, 1898.

TRAVELLING westward in the Rocky Mountains on the Canadian Pacific Railroad, and after having passed the Great Divide at Stephen (5296 feet) and the Wapta Lake at Hector (5190 feet), a wild valley is visible to the right, the entrance

to which seems to be barred by precipitous, forest-clad mountain walls; its upper terraces are covered by extensive ice-fields. This is the so-called North Fork Valley, — the stream emerging from the same being considered as the right fork of the Wapta or Kicking Horse River, although from a geographical point of view it seems rather to be one of the different affluents of the latter river, the source of which is formed by the Wapta Lake and a few creeks emptying into it. In the background of this hitherto untrodden valley a high, glacier-clad peak is visible from the railway, and to explore the region to a point as high as possible upon this peak was the purpose of the journey which these pages report. This object was attained only partially, the greatest drawback being that, once in the valley, the mountain was lost from sight, and the way leading to its ascent was discovered too late to be made use of. No other name being known to me, I have called the peak "Hidden Mountain."¹

After having passed the North Fork Valley, the station at Field (4050 feet) is soon reached, where the railway company manages a little hotel and tries to make the traveller as comfortable as possible, — an endeavor which, during my stay, was not always seconded by the persons employed in the house. Making Field my starting point, I left the place on the morning of July 15, 1897, accompanied by Fred Stephens, Ralph Edwards and the cook, Frank Wellman, all three on horseback. Our outfit was carried by four pack-horses, everything having been provided by Mr. T. E. Wilson of Banff, to my great satisfaction. Abstaining from taking a saddie-horse for myself, as the nature of the valley seemed too unfavorable for equestrian exercise, I made the whole trip on foot. After the first day the men had to walk nearly continuously as well. For crossing the rivers, however, one or two saddle-horses are necessary.

As the entrance to the North Fork Valley could hardly be worse from the west, by way of Emerald Lake,² than it appeared

¹ This is the peak mistakenly identified as "Mt. Balfour" in Plates VI. and VIII. of this volume of APPALACHIA. — Ed. *non M. Habel.*

² A visit to this lake and the Natural Bridge; a walk to the western Ottertail bridge, affording a most beautiful view of the Ottertail Range and the mountains north of Emerald Lake, which fitly may be called Emerald Range; and a walk to an eastern point, opposite the North Fork Valley, or to Hector are three excursions



THE FOOT OF THE WAPTA GLACIER

From a Photograph by Jean Habel.

to be from the south, I decided to attempt it first from that side. In one hour from Field the "Natural Bridge" is reached, where a bar of cambrian slate stretches from one side of the Wapta to the other, with an outflow for the stream in the centre, but easily traversed by *homo sapiens*. The railway company had a bridge built this year over the bar, and our horses were the first to cross it. From the Natural Bridge to the creek flowing from the lake, where another bridge would be convenient, requires another hour, and then, after a third hour's walk from Field on a good trail, leading through a fine forest, Emerald Lake (about 4220 feet¹) is reached. Our outfit was shipped on board the little craft stationed there, and rowed over by Fred to the northern shore, where we pitched our tents, the horses having been driven around the western side. The lake had a temperature of 55° F.; the numerous little springs rising near its shore and emptying into it, of 42°.

The next morning was a very damp one. To beguile the weary hours I made myself waterproof and entered the narrow valley, which opens to the northwest of the lake. Two hours' walk brought me over the débris of an avalanche to its upper end, a precipitous cirque, with high tilted strata to the west and a hanging glacier to the north, the right side of the latter descending in a narrow ribbon pretty far down. On my way back I met a porcupine on its way up, which passed within a yard of my feet. The morning of July 17 was also damp and cold (5 A. M. 38° F.) With Fred and Ralph I left the camp at eight o'clock to ascertain whether it would be possible to take our horses to a higher camp and find there the necessary feed for them. We traversed the little plain behind Emerald Lake to the northeast, crossed the creeks without difficulty, and moved up the unwooded slopes of the Emerald Range, skirting its perpendicular walls. Coming into forest again, we turned further north and found, after three hours' walk from our

which may be easily made and which will give great satisfaction to any visitor at Field.

¹ This and the following heights have been determined by two aneroids, controlled by the boiling point of the water. The little sketch map, attached to the paper, has been compiled by aid of numerous bearings, taken on the road. It will no doubt be found incorrect and can only be considered as a finger-post for the reader.

camp 1, a good camping ground with two or three days' feed for our horses and water about twenty minutes higher up. Ascending the Emerald Range still further and turning to our right towards the North Fork Valley, we reached in one hour a point (7110 feet) from which a good part of the latter valley could be overlooked. We were here standing on the rim of the extensive hanging glaciers, which cover the northern flanks of Emerald Range. In the background of North Fork Valley a so-called "valley glacier" was visible, descending into it in a fine ice-fall.

The torrent from the hanging glaciers, which cover the eastern terraces of the valley, descended directly opposite to us in a very powerful waterfall. Rushing from under the ice at about the height of our standpoint, this fall plunges over a nearly perpendicular wall down to the very level of the valley bottom in beauty and grandeur hardly to be excelled by any other on our globe. An entire view of the fall can only be got from a point like that at which we stood, and not from the lower parts of the valley. The difference between the height of our standpoint and the foot of the fall is over 2100 feet. From this figure much must be deducted as not of the fall proper, yet it seems no exaggeration to say that the fall is one of the highest in the world, although it certainly does not go down in so vertical a leap as the Yosemite Fall in California. The latter, the height of which is given at 2600 feet, has a first vertical descent of 1500 feet; of the remainder, 600 feet are cascades, and then comes a final plunge of 400 feet. But it is fed by temporary snow-fields, and while in spring it carries a large volume of water, it is greatly reduced in summer, after the snow has melted away. So, too, the fall which is sometimes quoted as the highest in Europe descends for over 1400 feet from the glaciers on the Pic du Marboré into the Cirque de Gavarnie, near the French village of the same name in the Département des Hautes Pyrénées; but its volume is so slight that it reaches the bottom only in spray. The fall in the North Fork Valley, draining parts of the extensive glacier-fields on the western slope of the ridge stretching south from Mt. Balfour, will always have a large supply of water.

On the way back to camp I shot a very fine mountain

goat, which, after the fatal wound, following the peculiar habit of its race, went down over a precipice; we found it quite near to our intended camp 2. The meat of this very heavy buck, which the united force of our six arms was unable to lift, proved later on to be very good indeed, in taste like beef. It enabled us to remain longer in the valley than we had anticipated.

As the weather was uncertain, I stopped another day at camp 1, and then, on the 19th, we achieved the difficult task of getting the horses and outfit up to camp 2. The most difficult part of the way was in the wood, where we came upon an old trail. This we left to our right, ascending the steep slope in a zigzag through fallen timber and along the rim of a narrow field of boulders on our left. Crossing the latter, we emerged into a more open space, studded with small fir-trees, on the other side of which we camped (6320 feet). The situation here was most delightful. To the north rose the steep buttresses of the Emerald Range; to the south, Mt. Field, and to the southeast its neighbor, the massive mountain, carrying a small glacier on the platform under its summit,—a peak visible from all our later camps in North Fork Valley and called in the lack of other information, "Mt. Wapta." Over Emerald Lake we looked far down the valley of the Kicking Horse River, flanked on one side by the Ottertail Mountains, on the other by the Van Horne Range, and the Selkirks with Sir Donald (169½°) in the far distance.

From camp 2 the unsuccessful attempt was made to penetrate further up into the Emerald Range. We left our camp for this purpose at five o'clock in the morning, but were driven back by a severe thunderstorm, after two hours' climbing over difficult ground. The descent on the slippery rocks had to be made very carefully, and at nine o'clock I was glad to be back at camp, though wet through. Next day I started with Ralph to reconnoitre the way down to the North Fork Valley, while Fred looked for the horses, which had wandered away. Both parties returned successful. And so, on July 22, at 7.30 A. M., we left this delightful camp, sorry not to have been favored here by better weather. We managed to get our horses safe and sound down to the old trail, mentioned above. This we followed, reaching at ten o'clock a point (6030 feet) which may be considered

as the divide between Emerald Lake and North Fork Valley, and half an hour later a small lake (5940 feet; temperature 52.7°), along which we skirted by its southwestern shore to the outlet. Following for a while this stream, which turns from a northeasterly to a northwesterly course and soon plunges over a precipice, we reached at noon another lake (5570 feet) in shape similar to figure 8. From this lake we descended in forty-five minutes to the level of the North Fork Valley, where not far from the foot of the great waterfall and close to the river we established our third camp (4930 feet).

At eight o'clock the next morning I left the camp, but after an hour's walk decided to wait for the horses at the river. We crossed over to its lower left bank, passed two glacier-streams, and then had to cross back again to its right bank, as the river comes plunging through a narrow gorge. We ascended the steep slope this side of it, through a dripping wood, to a little opening just large enough for our camp 4 (5150 feet), where we arrived at 11.30 A. M., thoroughly wet, of course. Our horses were confined here to a small place between the beginning of the gorge and our camp, and much exposed to wind and weather. At eight o'clock in the evening they bolted, but did not get very far. On this occasion the cook, Wellman, distinguished himself, but came back so perfectly soaked through that I had to have recourse to my own wardrobe to get him dry again. There was fresh snow on the higher parts of the mountains next morning, the temperature being 39° at 5.30 o'clock. After an hour's walk from our camp, I was drenched again by the wet underbrush in the forest. Emerging from the latter, a fine view of the gorge was attained. I was now able to walk, unmolested by wet shrubs, in the open, and to follow the right bank of the river. After another hour I came to a fine fall, very picturesque but of no great height. I was just able to cross the creek forming the fall, but a few yards further on had to wait an hour and a half for the horses to take me over another glacier-stream which here joined the river. The horses arrived at ten o'clock, having found and enjoyed a good feed on the way, and half an hour later we got to another gorge, at the beginning of which (5310 feet) we established our camp 5.

With Ralph I started at 12.40 P. M. to see whether it would

be possible to take the horses along the right bank of the gorge. At 2.30 we got to an open place, where horse-feed would have permitted to camp for a night. From here to the southwest another very fine waterfall was visible, — a twin fall of considerable height: two glacier-streams approach close to each other, and, going down separately over a perpendicular precipice, unite at its foot. Here we turned to the northeast, and stood at 3.10 beyond the gorge (5770 feet), on the high bank of the river, overlooking its opposite bank and part of the glacier, from which the former originates. We returned from here to our camp, keeping close to river and gorge, and arrived there at 5.45, convinced that it would be very difficult to get our horses further up on this side. So we decided to try the other side of the river, and left at ten o'clock next morning. Starting ahead of the horses, I climbed a little too high. Travelling closer to gorge and river, they passed me, and at 12.30 P. M. I found camp 6 (5650 feet) already established on a small elevation close to the stream, and in view of the beautiful glacier which, as source of the North Fork of the Wapta, may fitly be called "Wapta Glacier." The river emerges from a fine ice cave, at the foot of which (5680 feet) I determined the boiling point¹ of the water to be 95.545° C. = 623.43 mm. = 24.545 inches.

After a very cold night, during which the thermometer, moistened by heavy dew, went down to freezing point, we started at 7.30 A. M., ascended the tongue of the glacier, and crossed over to its right bank. At 9.30 we passed the entrance to a western side valley, marked by a green island with some trees on it, and reached at 10.30 the highest point of the lateral moraine (7670 feet). From here we descended a few feet down to the glacier, which we soon found covered with soft snow, obliging us to take the rope. We were now on the great ice-field, which in this part of the Rockies is said to stretch far to the north, and in this direction perpendicular ridges of rock, several hundred feet in height, emerge from the same. We turned to the western part of the basin, which perhaps sends down another valley glacier (292°), towards the so-called North Branch of the Kicking Horse River, and halted there at 1.15 P. M. (8840 feet), lunching, observing, photographing. Fine,

¹ July 25, four P. M. Temperature of the air, 8° C. (46.4° F.).

glacier-clad mountains stood near to us, two to the south (164° and 207°), one to the northwest ($308\frac{1}{2}^{\circ}$), united to a rocky wall; and to the east stretched the three peaks which border the left bank of the Wapta Glacier, the highest (100°) more to the north, the eastern part of the great glacier basin descending between them into the main stream. To the southeast the chain of the Rockies south of the Kicking Horse River was visible: the Ottetail peaks of Mt. Goodsir ($141\frac{1}{4}^{\circ}$ - 140°), Mt. Stephen (134°), Cathedral, Biddle, Hungabee, Huber, Victoria, and Lefroy, a most wonderful view, which reminded me of the Dolomites in the Alps. At 3.30 we retraced our steps, reaching camp at 6.45 P. M.

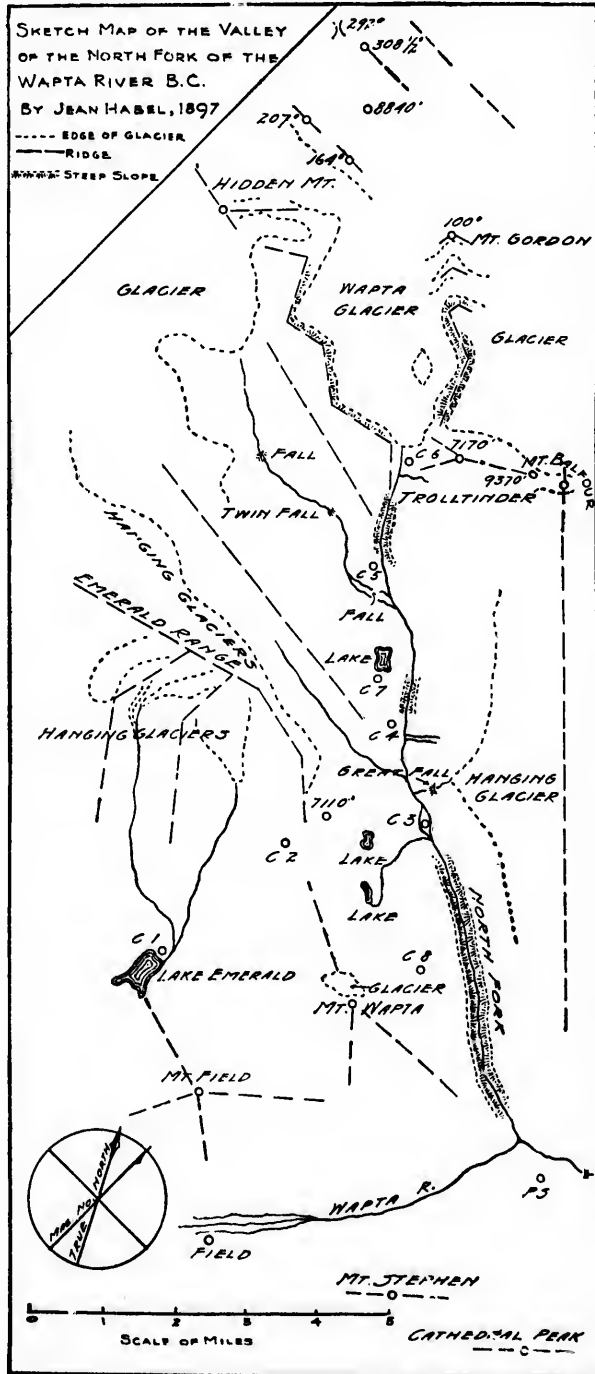
The next day was spent in the environs of our camp, and on the 28th the eastern slope of the valley was ascended. A steep climb of an hour and a half brought us to a point (7170 ft.) where the whole western side of the North Fork Valley was visible, including Hidden Mountain. The ascent to the latter would perhaps be easily achieved through the side valley, the entrance of which we passed on our way to the glacier basin. This mountain and its glacier-clad neighbors is drained by the stream which forms the above-mentioned Twin Fall and the little picturesque fall we passed before camp 5. We had a very fine view of the former from here, and above it part of another fall formed by the same torrent was visible. To the south of this "Waterfall Valley" the whole northern side of Emerald Range, Mt. Wapta, and the Mt. Stephen group were visible. To the east, not far from us, stood the perpendicular walls of Mt. Balfour and, separated from it by a small glacier, a characteristic mountain, to all appearance quite inaccessible from this side, resembling somewhat a well known mountain in the Norwegian valley of Romsdalen, and which I therefore called "Trolltinder." Ascending further east, we got in two hours to the highest point (9370 feet) of the ridge which here borders the southern part of the great glacier basin at the foot of Mt. Balfour. The weather, in the morning cloudy and rainy, had cleared up, and we could even see, to the right of the Ottetails, something of the distant Selkirk Range. A descent of two hours brought us back to the camp. The evening was a most glorious one. At sunset Mt. Stephen appeared from

Toward Mt. Stabel.

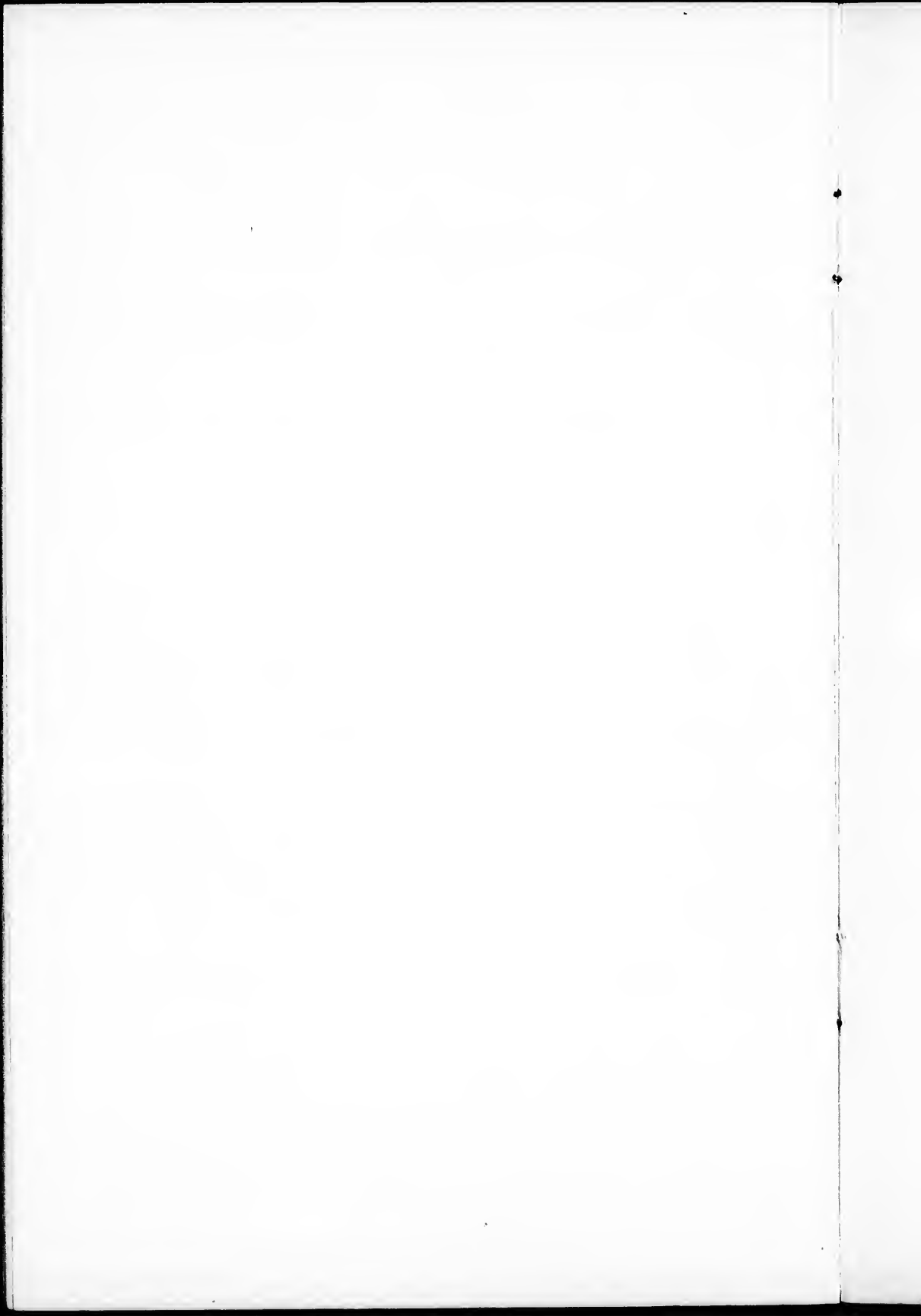
34°
 sky
 der
 to
 ing
 ain
 le:
 en
 and
 the
 ch-

 on
 eep
 (it.)
 was
 ter
 the
 sin.
 the
 the
 l a
 of
 the
 of
 ere
 lar
 rier,
 ble
 ain
 ore
 two
 ere
 foot
 ny,
 the
 ent
 was
 rom

MAP OF VALLEY OF NORTH FORK OF THE WAPTA.



Wm. H. Puchard, Tremont Bldg.
 Boston.



foot to top clad in a bright purple, and the weather promised to be fair next day.

But we, and still more our horses, began to run short of provisions; for them scarcely anything was left in the neighborhood of the camp to live upon. They always kept close to the latter, begging for salt and perhaps something more, which we were unable to provide. So we decided to turn back and to leave the place on the morning of July 29. I started at seven o'clock, and in fifteen minutes reached the beginning of the gorge, the right bank of which I followed as closely as possible, enjoying the fine views into it. At nine I found myself opposite our camp 5 (5310 feet), where I had to wait for the horses to take me over the river, which they did two hours later. Fifteen minutes further on, we crossed the two glacier streams coming from the west, one of them with the picturesque fall. Then we kept more to the right to a little lake, where Fred, on our way up, had discovered excellent feed, and where we arrived at 11.40 A. M. (5270 feet). We unpacked the horses here, and rested north of the little swampy plain leading to the lake. At 2.30 P. M. I walked around its rocky western shore and, measuring the temperature of its water, found it to be 66.2° F. No doubt that, as it lies at a height of 5270 feet above sea-level, where even in July the thermometer during night-time often goes down nearly to freezing point, this small and shallow sheet of water must be fed by warm springs. Water-plants were growing on its muddy bottom, on which was strewn much rubbish, amongst it the lower jaw of a caribou. The water was full of animal life, as beetles, snails, and an animal in shape and size similar to a sea-horse or a large branchipus, which I was unable to catch. Numerous water-creepers were rushing about on the quiet surface of the lake. Arriving at the southern end I found the situation so inviting, a rich vegetation and a fine view towards the Wapta Glacier, that, in the interest of man and beast, I resolved to camp here for the night. The day had been a very fine one, and we enjoyed a cloudless evening.

Starting at 7.45 next morning, we remained on the right bank of the river, without crossing to the left and back again, as we did on our way up. Over pretty even ground, only once being obliged to climb a steeper slope, we reached, at 9.30, our

camp 3 (4930 feet). Shortly below this camp the river descends through another gorge, and, as far as I could ascertain, it would be impossible to follow closely along the right bank from here to the confluence with the left fork of the Wapta. We turned a little to the west, and with many ups and downs, over most difficult ground, through a labyrinth of fallen timber, we worked our way to an open space, cleared by the avalanches from the slopes of Mt. Wapta. At noon we established here our last camp 8 (5100 feet). There was no water in the neighborhood of this camp, and we had to melt for our teapot the snow of an avalanche, still resting here close by. Our horses had likewise to apply to the frozen element; they were used to it, being accustomed to quench their thirst on the plains east of the Rockies, during winter-time, by licking snow. At four p. m. a thunderstorm swept over Mt. Stephen and Mt. Cathedral, which were in full view from our camp and presented a most striking appearance with the heavily loaded clouds hovering above and behind them. At five o'clock the storm came down upon our camp in full force, the rain nearly penetrating the tent. There was another shower at seven o'clock. Then the evening was quiet. My men, the jolly triplet, as a "good-by" to the mountains for this time, built a fire as big as I ever saw at this height above sea-level.

It was raining again next morning, but we were able to start at half past eight. First descending, we passed a swampy plain, and then climbed through dense shrubbery in two hours and a half to the pass (5420 feet) west of a little wooded mountain and seen from the railway. The descent from this pass and the ascent from Emerald Lake to camp 2 were perhaps the most difficult parts of the road traversed by our animals on this journey. But all the difficulties which rocky inclines and fallen timber opposed to them were most skilfully conquered. At 1.40 p. m. we found ourselves on the left bank of the Wapta, at the foot of Mt. Stephen. An hour's walk brought me back to Field.

