

APPENDIX

To the Report of the British Commissioners appointed in July, 1839, to explore and survey the Territory in dispute between the Governments of Great Britain and the United States of America, under the 2nd Article of the Treaty of Ghent.

RECORD OF BAROMETRIC OBSERVATIONS,

Made on the line of the Maximum Axis of Elevation, from the head waters of the Penobscot and St. John's Rivers to the Bay of Chaleurs, for determining the Approximate Heights of Land.

A LARGE portion of the disputed territory may be seen from the summit of Mars Hill, which is nearly 1,700 feet above the level of the sea. On the top of that hill a space has been cleared by cutting down the trees, and a framed stage has been erected, about twenty feet in height, for the purpose of obtaining a view of the distant country. This was done only a few years ago, to assist in the exploration undertaken by Captain Yule, of the Royal Engineers, as authorized by the House of Legislature of New Brunswick, for determining the best line for a rail-road from St. Andrews to Quebec.

The character of the country may be well discerned and understood from this insulated hill. It presents to the eye one mass of dark and gloomy forest to the utmost limits of sight, covering by its umbrageous mantle the principal rivers, minor streams, and scanty evidences of the habitation of man. The hill itself is also rarely distinguishable from any part of the surrounding territory; and it is only by the increased difficulty of the ascent that the traveller becomes aware of his approach to the summit.

In a country so unfavourable for the usual methods employed in determining geometric heights, barometers offered the only means towards obtaining that object, and fulfilling the conditions on that point, conveyed in the Instructions to the Commissioners by Lord Viscount Palmerston. A selection was accordingly made of such barometers as were supposed to be constructed on the most approved principles, and immediately available.

The barometers used for the above purpose were ten in number; viz.:-

Two, marked A and B, on Troughton's improved construction, provided with a gauge point, the brass box covering the cistern of mercury having two slits opposite to each other, the plane of the upper edges of which represent the zero or beginning of the scale: a screw at the bottom performs the office of adjusting the surface of the mercury to zero, by just shutting out the line of light below the zero point, as also of rendering the instrument portable for carriage, by forcing up the mercury to the top of the tube before it is reversed and placed in the case, which is conveniently formed by the tripod-stand, used in suspending the barometer for observation.

Four, numbered respectively 1, 2, 3, 4, on the construction of Mr. Howlett, Chief Draftsman in the Office of the Inspector General of Fortifications, Pall Mall. These barometers are not provided with a gauge-point, but have, marked on each, numbers indicative of the neutral point and capacity; the size of the bores of the tubes not rendering any correction for capillarity necessary.

Four, numbered 373, 374, 376, 377, made by M. Buntin of the Quai Pelletier, Paris. These barometers were procured from Paris by order of Lord Palmerston, having previously been compared, by the permission and aid of MM. Arago and Mathieu of the Royal Observatory at Paris, with the standard syphon in that establishment.

The construction is that of a syphon, having one leg perforated with a very delicate and minute point for the admission of air. The zero point is placed in the centre of the instrument, and at the upper and lower ends are two moveable verniers, which, when

adjusted as tangents to the upper and under surfaces of the mercury, measure the distance from the centre or zero, the sum of which is the height of the mercurial column in millimetres, tenths, and hundredths. The vernier is divided only to tenths of millimetres, but by the aid of a powerful microscope, which should always be used, the hundredth part may be correctly estimated.

The possession of these barometers proved of the greatest value towards the objects of the expedition. The advantages they possess of extreme lightness, perfection of division, and the great facility with which they are brought in a moment into the requisite position and adjustment for observation, give them a decided superiority over every other instrument of the same description, in a country abounding with such difficulties and obstacles for the transport of ordinary barometers as the disputed territory.

Three non-commissioned officers of the corps of Royal Sappers and Miners were carefully selected by Brigade Major Matson, by order of the Master General of the Ordnance, to accompany the expedition to America. The instruments were placed on board the "British Queen" steamer, at Blackwall, and arrived safely at New York. From thence they were conveyed by steam-vessels and rail-road to Boston, where they were again examined, and found to be in perfect order. From Boston to Bangor in Maine the conveyance was also by steam, and nothing occurred until the arrival of the expedition at that place, to alter their condition.

From Bangor to the frontier town of Houlton, the ordinary communication during the summer season was at that period by stage, over a road cleared through the woods, of the very worst description, partly in consequence of its not having been repaired for some considerable time before, but chiefly from its having been cut up by the transport of cannon and heavy wagons with ammunition and other stores for the military depôt and park of artillery at the Fort of Houlton during the same summer. Every expedient that could be devised for the protection of the instruments was adopted, the Paris barometers were held carefully and separately in the hand during the whole day and following night; and the remainder, which were much heavier, and which would, undoubtedly, have been broken or rendered unserviceable in any other position, were securely lashed outside the carriage at an angle of about 45°. Happily the stage was not actually overturned, though more than once on the point of being so; but the concussions were so severe, in crossing the cor-de-roy bridges (logs of timber laid across rivers and streams), added to the violent jolting occasioned by the wheels sinking into "honey pots" (holes in the road filled with mud and water) which could not be seen or avoided in a dark night, that the utmost apprehensions could not but be entertained for the safety of the barometers, and the condition in which they might be found on arriving at Frederickton.

The conveyance of the party and instruments from Houlton to Woodstock and Frederickton was also effected by stage; but the road was so far superior to that through Maine, that no fear could be felt of any other derangement of the barometers, than such as they might already have sustained.

On arriving at Frederickton, the Commissioners and their instruments were hospitably received by his Excellency, Sir John Harvey, into the Government-house, and a room was especially appropriated to the barometers at the top of the house, where they were carefully unpacked and examined on the following day.

Extract from the Register of the Barometers.

"On examining the barometers at the Government-house, to ascertain what injury they had sustained, in consequence of the violent jolting by carriage over the wretched roads in the State of Maine, the following results were noticed:—

Barometer A.	A slight escape of mercury outside the cistern.
" B.	No appearance of escape of mercury.
No. 1.	In good order.
" 2.	Ditto.
" 3.	Contained air.
" 4.	In good order.
" 373.	Contained air.
" 374.	Ditto.
" 376.	In good order.
" 377.	Ditto.

From the peculiar construction of Mr. Howlett's barometers, in case of admission of air into the tube, it is frequently practicable, by reversing the instrument several times successively, to disengage a large portion of it from the column of mercury; and in this instance, by pursuing that mode, the larger proportion of the air was expelled, and the reading was restored to within two-hundredths of an inch of the other barometers constructed on the same principle.

This difference from the construction of the usual mountain barometers consists in the absence of the usual elastic leathern bottom to the cistern, which, in common barometers, is forced up by a screw beneath to the height that may be necessary to bring the surface of the mercury in the cistern to the gauge point, or to force it to the top of the tube nearly, previously to the instrument being reversed for carriage.

In lieu of the leathern bottom a brass cap is placed within the body of the cistern, which, on the barometer being reversed, and so filling the tube with mercury, is screwed

tight against the bottom of the tube by means of a screw connected with it, and passing through the bottom of the cistern. The peculiarity attending this construction permits the expulsion of a large portion of intruding air, as was exemplified frequently during the course of the barometric observations through the disputed territory.

It is extremely difficult to account for the admission of air which was apparent in the French barometers, Nos. 373, 374, on examination at Frederickton, except that no instrument, however perfect in its construction, could, except by good fortune, escape injury to a certain extent, from the repeated and violent concussions and jolting through the State of Maine. The air was, indeed, partially, and apparently totally expelled by frequently reversing, as with Mr. Howlett's barometers when in a similar condition, and the instruments returned nearly to their readings with the others.

In the frequent use of the Paris barometers, in the course of the exploration, it was found, by experience, that they require a peculiar management. The tubes being manufactured of glass of extreme thinness to avoid capillary action, in moving the instrument for observation, or for the purpose of putting it into the leathern case, caution is required not to do so too suddenly, the weight of the mercury when quickly forced against the end of the tube having a tendency to break it; and the perforation in the open leg being so minute, that the air which enters to fill the space occupied by the mercury when in a position for observation, has not time to escape, if the mercury be suddenly forced back again by an impulsive movement resulting from want of caution in inverting the barometer to a position for observation.

During the stay of the Commissioners at the Government-house at Frederickton, the barometers were frequently compared, the temperatures of the attached and detached thermometers carefully taken, and the value of each, with reference to the others, accurately ascertained and registered.

The attached thermometers of A and B were both divided to the Centigrade and Fahrenheit's scales;

No. 1, 2, 3, and 4, to Fahrenheit's only;
and No. 373, 374, 376, and 377 to Centigrade.

The detached thermometers were

Four, ingeniously connected by a folding arm, to barometers No. 1, 2, 3, 4, divided to Fahrenheit's scale.

Two of Fahrenheit's scale; and

Two Centigrade ditto, of a very delicate and sensible kind, made by M. Bunten, and purchased in Paris at the same time with the barometers.

Every arrangement having been made, and every assistance given by his Excellency Sir John Harvey, Chief Justice Chipman, Mr. Odell the Surveyor-General, and the other authorities at Frederickton, to secure a successful passage through the disputed territory, the Commissioners securely placed the barometers on board a horse boat, and proceeded up the river St. John to the Great Falls, where Sir John Caldwell had hospitably provided for their accommodation, and had preceded them for that purpose some days.

On arriving at that part of the river the nearest to Mars Hill, they disembarked with the barometers, and proceeded to ascend to the summit; having previously placed the instruments in a position for observation, and registered the readings in a barn on a height above the river, known as Pomphret's Barn, and notable for its connexion with the survey undertaken by order of the House of Assembly of New Brunswick, towards the construction of a railroad from St. Andrews to Quebec.

The barometers were then conveyed to the summit of Mars Hill, and placed against the stage erected on it by the same parties, for the purpose of seeing over the tops of the trees and investigating the nature of the country within view. The summit of the hill had also been partially cleared, to effect the same object more completely; and there being no shelter, and the wind blowing fresh at the time, the vibration of the mercury was so great that it became necessary to remove the instruments to a position about five feet below the summit; where, by means of lighting fires to keep off the numerous flies, the operation was at length completed.

On returning to Pomphret's Barn, the barometers and thermometers were again observed and registered.

The party then embarked, and proceeded to the Great Falls; the Commissioners being kindly received and entertained under the hospitable roof of Sir John Caldwell; and the instruments being placed in a small wooden building which he obligingly appropriated for the purpose, where they were soon after carefully registered and compared, and left for further observation: their condition being found similar to that of the preceding comparisons at Frederickton.

In order to obtain correct barometric heights above the sea, it is obviously necessary that simultaneous observations should be made at the stations the heights of which are desired to be known, and at that forming the standard level, the height of which is known or presumed, either by previous barometrical measurement, or determined by the spirit level, or by actual measurement to the surface of the ocean.

By examining the geographical character of the disputed territory on the map, it will readily be seen that the Great Falls on the river St. John form a position well suited to the last mentioned object; viz., that of constituting the standard point to which the barometrical altitudes throughout the country to the east and west might be referred. That part of the condition requiring the height of the said standard point above the sea to be known, had fortunately been previously fulfilled by order of the House of Legis-

lature of New Brunswick. Pursuant to their orders, a series of levels had been made from high tide at Chapel Bar, a few miles below Frederickton, to the summit of the Great Falls. The details are published in their Journal, of which the following is an extract.

"Levels on the River St. John from Frederickton to the Great Falls.

	Distance.	Height. Inches.
" From Frederickton to the confluence of tide below Chapel Bar	4:47:57	
" Confluence of tide to French Chapel	3:15	43
" French Chapel to Cliffs Bar	7:52	129
" Cliffs Bar to the head of Bear Island	5:70:40	227
" Bear Island to Nacawakac	8:54	
" Nacawakac to Meductic	4:68:50	55
" Meductic to Eel River	9:25	220
" Eel to Griffith's Island	9:43	168
" Griffith's Island to Macmullans	12:26	144
" Macmullans to Presquisle	8:8	
" Presquisle to Rivière du Châte	14:77	375
" Rivière du Châte to Tobique	12:71	765
" Tobique to Great Falls	21:12	
" Total Miles	125:39:47	2127."

The total rise is 2127 inches, or 177 feet 3 inches, on the distance of 125 miles, 39 chains, and 47 links, to the basin on the River St. John at the foot of the Great Falls.

Height of the basin at the foot of the Great Falls above the tide at	Feet.	Inches.
Chapel Bar	177	3
Perpendicular height of the Great Falls	74	0
Descent through Rocky Channel	45	6
Total	296	9

The total height of the bed of the River St. John above the tide at Chapel Bar being 296 feet 9 inches.

The levels here detailed, and conducted by a surveyor of approved skill and character, are not, however, the only evidences of the accuracy of the above measurement. It will be hereafter shown that the height of the same station is deduced by barometric measurement from the Bay of Chaleurs; and the result is such that no doubt whatever can exist of the fidelity of the above statement.

Three barometers were conveyed across that part of New Brunswick from the Great Falls to the Bay of Chaleurs, and observations made at two points in that Bay, viz., near the mouth of the Jacquet River, and at Bathurst, a town on the south side of the Bay; the mean results of which give a height of *four hundred and sixty-seven feet from the high water mark in the Bay, to the Observatory at the Great Falls of St. John.* The height, by a mean of five barometric observations, from the basin below the Great Falls to the Observatory above the Great Falls, was found to be 205 feet; and including 177 feet 3 inches, as determined by levels from the high tide mark at Chapel Bar, with the addition of 8 feet for the height of the barometer above the ground on which the Observatory was placed, gives a total height of *three hundred and ninety feet for the height of the Observatory above the tide at Chapel Bar on the River St. John,* the mouth of which is in the Bay of Fundy.

The same height as before stated, measured barometrically from the Bay of Chaleurs, was found to be 467 feet, making a difference of 77 feet between the two measurements; the result being, supposing the respective measurements to be correct, that the high water mark in the Bay de Chaleurs, is to that amount below the level of high water mark in the Bay of Fundy.

In the American Ephemeris for the present year, published at Boston, is given a table showing the rise of the spring tides at several ports and places on the coast of America, including the Bay of Fundy; and it is therein stated that the latter have been ascertained by recent observations. According to the computations resulting therefrom, it would appear that at Cumberland Fort Basin, at the head of the Bay of Fundy, the greatest rise for the preceding year at that place was *eighty-one feet sixty-five hundredths.*

Chapel Bar, from its position, being fifty miles up and distant from the mouth of the River St. John, may be assumed to be the equivalent of Cumberland Fort, for the purposes of the same computation; as being subject to the same laws which have the tendency and effect to force the tide waters to a higher level at a distant point in any estuary, than to any other point nearer to its mouth.

In the same Ephemeris is also given the height of the water at spring tide, at Prince Edward's Island, in the Gulf of St. Lawrence, not far distant from the Bay de Chaleurs; which, by the same computation, would show a total rise of six feet and nine-tenths on the shore of Prince Edward's Island.

The rise of the tide north of this point, has not been ascertained by the authors of the American Ephemeris; and for want of other data, as also with reference to the peculiar

formation of the Gulf of St. Lawrence, Bathurst, in the Bay of Chaleurs, is assumed as the equivalent of Prince Edward's Island.

The difference between the two inferences above stated, viz., the greatest height of tide at Chapel Bar, in the Bay of Fundy, 81.65 feet, and at Bathurst, in the Bay of Chaleurs, 6.9 feet, is 74.75 feet; and the same, calculated by barometrical measurement, amounts to 77 feet, showing a total difference of little more than 2 feet between the two results.

This accordance is far beyond what could be looked for under the most favourable circumstances, and with every condition present to render barometrical observations most worthy of confidence. Barometers have, perhaps, been more extensively used on the Ordnance Surveys of England and Ireland, and their results have been compared with those deduced from trigonometrical measurement, on a greater scale and with more perfect materials than in any other part of the world: the experience of which has proved that heights computed from barometrical observations, cannot be inferred *with certainty*, within ten feet of the truth.

In exploring the disputed territory, barometers were adopted, as has been before observed, as the only means which the condition of the country admitted for obtaining the approximate heights of land; and had the difficulty of transport been less, and had it been practicable to use larger instruments in taking depressions and elevations, the results would have still been liable to doubt, inasmuch as the trees on the summits of all the hills, with the exception of one or two, vary from 60 to 120 feet or more in height; rendering observations uncertain, at least, to that amount of difference. It is not attempted, therefore, to insist that by any practicable process, a result such as has been shown above, could be obtained, so as to entitle it to perfect confidence; but it is such that a justifiable ground of conviction must remain, that the height of the Observatory at the Great Falls has been determined within comparatively very narrow limits.

The Great Falls having been, accordingly, fixed upon as a standard in reference to the travelling barometers, barometer No. 1 was selected for the purpose, and placed in the upper floor of the building in which it had been previously deposited, and compared with the others, at the height of thirteen feet above the level of the ground.

This was the only place available for the purpose, combining, at the same time, safety and shelter. The sides of the building were of wood, but not lined; and the shingles of the roof were so far open at intervals, that the air had free admission. Corporal MacGregor, of the Royal Sappers and Miners, who had been long employed on the survey of Ireland, and was accustomed to take angles with theodolites, was selected to keep a register of the instrument. His orders were given to him in writing, accompanied with a proper form, to be pursued in the register, of the height of the barometer, of the attached and detached thermometers, and the state of the weather and wind, to be recorded three times daily, viz.—at eight o'clock, A. M., at noon, and at four, P. M.

This register was maintained from the 13th of September to the 24th of October inclusive; between which periods observations were made as nearly simultaneous as possible, from the head waters of the Penobscot to the Bay of Chaleurs, during the progress of the exploration.

The line of proceeding having been determined, barometers B, No. 4, and No. 337, were placed in the charge of Mr. Wightman, an intelligent and competent surveyor of Frederickton, who had been recommended by his Excellency Sir John Harvey. His previous knowledge and long practice with instruments, shortly enabled him to understand the readings and different adjustments of each. He was also supplied with two of Bunten's delicate thermometers for registering the independent temperature of the air. One divided to Fahrenheit, the other to the Centigrade scale. And he performed the duties required of him, as far as the difficulties of the undertaking would permit, through a country which was before almost entirely unknown, with the utmost care and circumspection. The barometers confided to him were selected as being amongst the most perfect. He succeeded in reaching the Bay of Chaleurs with two of them in good order; viz.—Troughton's marked B, and Bunten's syphon 377. No. 4 suffered by accident, as might be expected out of the number; and both the detached thermometers were broken after arriving at the Bay of Chaleurs,—a subject of regret and inconvenience, of course,—but the main object having been already accomplished, of comparatively little importance. In making the usual correction for the strata of air, where the record is found deficient in registering the state of the temperature by the detached thermometer, that of the attached thermometer has been used, an approximation sufficiently near to prevent any great source of error, or to affect the computations, except in a trifling degree; as the barometers, when set up for observation, were always allowed to stand for at least a quarter of an hour, so as to render the temperature of the mercury and surrounding air as nearly equal as possible.

Mr. Wightman was also provided with written instructions, to record the state of the barometers at least three times every day, at the same hours as those appointed for register at the Great Falls, and at all other times when any great difference of level was perceptible.

The remaining barometers by Troughton, marked A

No.	2
No.	3
No.	373
No.	376

were retained by the Commissioners, and conveyed to the westward of the Great Falls to the head waters of the Penobscot and St. John's Rivers.

Of this number, all, excepting No. 374, were successfully carried to the extreme source of the River Roostuck, the Lake Wallagasquigam, called in some maps Allasquegamook; or windy lake, forming the head waters of the River Allegash, where the expedition halted for the first time to rest. Barometer 374 was broken by accident in a canoe on the 13th of September, but was less to be regretted, as being one of those found to be defective at Frederickton.

Advantage was taken of the stay of the expedition at the lake, to place the barometers in a secure position for observation, and to record them at the same hours appointed for the like purpose at the Great Falls.

On the arrival of the expedition at Quebec, an opportunity offered for a second comparison of heights, as computed from barometric measurement, and those derived, and obtained, by direct means, in the usual manner.

The citadel of Quebec on Cape Diamond, offered a convenient means for the purpose, and care was taken to profit by it.

Colonel Oldfield, the Commanding Engineer in Canada, afforded every facility, as also by granting access to the plans in his office, containing the requisite information.

The citadel is situated on the summit of the precipice overlooking the River St. Lawrence; and what is termed the "Old Cavalier," stands on the highest point of it, to which any direct measurement had been made. The height from the floor of the platform of the Cavalier to high-water mark in the St. Lawrence, was found to be 333 feet, 3 inches; and the operation was commenced, of comparing the computed barometric height with the same. Barometer 376 was chiefly used for the purpose, as having been kept uninjured and unimpaired throughout the expedition, and as never having sustained derangement of any kind; being indeed as perfect as when delivered from the Royal Observatory at Paris.

Barometers A and No. 2 were also recorded; but barometer A had experienced injury by some unknown means some time before; as was evident by the escape of the mercury perceptible outside the glass cistern, to which it adhered in small globules: and barometer No. 2, on being placed on the Cavalier, was found to contain air which resisted every means adopted for its expulsion.

The operation was commenced on the 26th of October, and repeated on the 30th following.

First, by observing the barometers on the platform of the Citadel, after allowing them to remain a sufficient time to bring the mercury nearly to the external temperature; frequently reversing the instrument, and reading and recording at each reversal. The barometers were then carefully carried through the town of Quebec to the Queen's Wharf, and placed at a little distance from the walls of a building sheltered from the sun, nine feet from high-water mark, which was registered on a post in front of the wharf, where the operation of reading and reversing, and again reading, was frequently repeated. They were then restored as quickly as possible to their original position on the platform of the Citadel, and registered as before with the like precautions; when the difference between the last and the original readings was found to be about $\frac{4}{10}$ of a millimetre, and the mean of the two results was adopted for the height of the mercurial column at the platform. The barometers being suspended 3 feet above it.

The computed height by this first operation amounts to $331\frac{2}{10}$.

On the 26th of October the barometers were first observed on the Queen's wharf; next on the citadel, and again at the Queen's wharf. The difference between the sum of the readings at the first and second operation on the Queen's wharf being $\cdot 025$ of a millimetre.

The computed height by the second operation amounts to $332\frac{4}{10}$, being so near an approximation to the actual height, as measured by the Royal Engineer's Department, viz., 333 feet, 3 inches, that little need be said in favour of barometers when properly constructed and kept in good order, and when sufficient time can be commanded for careful observation.

Subjoined are the registers of the barometers, made during the course of the expedition, commencing with the Great Falls.

GREAT FALLS.

Date.	Bar. No. 1.	Ther. A.	Ther. D.	Weather.
September 13, 8 A.M.	29·510	45	42	Fine weather; wind north-west.
12	29·604	42	42	
4 P.M.	29·606	49	47	
14, 8	29·508	43	40	Fine weather; wind north-west.
12	29·601	46	44	
4	29·606	60	57	
15, 8	29·850	47	45	Fine weather; wind south-west.
12	29·808	59	58	
4	29·802	66	65	
16, 8	29·620	56	55	Rain, ended 9 A.M., dull weather for the rest of the day; wind south-west.
12	29·665	62	62	
4	29·663	63	61	
17, 8	29·710	57	56	Rain since 9 A.M.; wind west.
12	29·677	60	59	
4	29·675	62	60	
18, 8	29·635	57	57	Dull weather till 3 P.M., rain afterwards; wind south-east.
12	29·558	60	60	
4	29·430	65	65	
19, 8	29·230	60	59	Rain till noon, fine afterwards; wind north-west.
12	29·254	62	60	
4	29·302	62	61	
20, 8	29·505	49	49	Fine weather; wind south.
12	29·505	61	63	
4	29·454	66	66	
21, 8	29·605	47	47	Fine weather; wind west.
12	29·655	47	48	
4	29·655	46	55	
22, 8	29·505	43	43	Dull weather and frequent showers of rain during the day; wind west.
12	29·370	46	45	
4	29·210	50	50	
23, 8	29·045	59	58	Dull weather till 11 A.M., fine afterwards; wind north-west.
12	29·125	60	60	
4	29·145	64	63	
24, 8	29·285	45	45	Fine weather; wind west.
12	29·258	53	53	
4	29·258	58	57	
25, 8	29·354	41	41	Fine weather; wind north-west.
12	29·330	50	49	
4	29·315	60	59	
26, 8	29·170	45	45	Rain all day; wind north.
12	29·035	47	47	
4*	28·910	49	50	
27, 8	29·330	39	40	Fine weather; wind south-west.
12	29·330	52	54	
4	29·265	57	56	
28, 8	29·435	37	39	Fine weather; wind north-west.
12	29·497	45	47	
4	29·525	48	47	
29, 8	29·668	35	37	Fine weather; wind north-west.
12	29·675	46	47	
4	29·710	49	49	
30, 8	29·847	35	35	Fine weather; wind south.
12	29·847	44	47	
4	29·825	58	58	

* Minimum.

GREAT FALLS—(Continued.)

Date.		Bar. No. 1.	Ther. A.	Ther. D.	Weather.
October	1, 8 A.M.	29·825	35	37	Fine weather; wind north-west.
	12	29·825	47	48	
	4 P.M.	29·767	48	50	
2,	8	29·659	41	43	Cloudy weather; wind south-west.
	12	29·563	51	52	
	4	29·465	52	52	
3,	8	29·205	48	49	Rain till noon; fine afterwards.
	12	29·164	52	52	
	4	29·126	54	54	
4,	8	29·184	44	44	Showery all day and wind blowing fresh from the north-west; shower of snow at 5 P.M.
	12	29·287	43	42	
	4	29·420	43	45	
5,	8	29·888	39	34	Fine weather; wind north-west.
	12	29·935	39	41	
	4	30·035	50	50	
6,	8	30·178	32	32	Fine weather; wind south.
	12	30·178	42	46	
	4*	30·185	59	60	
7,	8	29·944	32	31	Dull weather and showery afternoon; wind south.
	12	29·869	43	45	
	4	29·810	46	37	
8,	8	29·810	47	48	Cloudy till noon, fine afterwards; wind north.
	12	29·842	57	57	
	4	29·810	60	61	
9,	8	29·810	52	52	Fine weather; wind north-west.
	12	29·737	57	57	
	4	29·696	65	64	
10,	8†	29·430	50	50	Rain till noon, fine afterwards; wind north-east.
	12	29·468	53	53	
	4	29·486	57	56	
11,	8	29·730	35	36	Fine weather; wind north-west.
	12	29·704	42	44	
	4	29·662	53	54	
12,	8	29·753	32	33	Fine weather; wind south.
	12	29·778	45	48	
	4	29·725	58	57	
13,	8	29·468	45	47	Dull weather; wind south.
	12	29·417	49	49	
	4	29·410	56	57	
14,	8	29·690	44	44	Fine weather; wind south.
	12	29·726	45	45	
	4	29·710	50	50	
15,	8	29·710	43	44	Fine weather; wind west.
	12	29·684	50	52	
	4	29·705	61	62	
16,	8	29·810	40	40	Fine weather; wind south.
	12	29·844	50	52	
	4	29·825	65	66	
17,	8	29·686	45	45	Fine weather till noon, showery afterwards; wind south.
	12	29·675	52	53	
	4	29·610	53	53	
18,	8	29·710	46	46	Dull weather and showery afternoon; wind south.
	12	29·578	51	52	
	4	29·524	53	53	

* Maximum.

† Remarkable fall and sudden rise in the barometer.

GREAT FALLS—(Continued.)

Date.	Bar. No. 1.	Ther. A.	Ther. D.	Weather.
19, 8 A.M.	29.524	48	48	Dull and hazy weather; wind north-east; fall of snow during the night.
12	29.543	45	45	
4 P.M.	29.543	39	40	
20, 8	29.834	29	29	Cloudy weather; wind north-west.
12	29.886	31	31	
4	29.944	33	34	
21, 8	30.134	29	30	Cloudy weather till noon; fine afterwards.
12	30.182	32	33	
4	30.124	43	44	
22, 8	29.973	25	26	Dull weather; wind south.
12	29.882	37	35	
4	29.810	37	38	
23, 8	29.910	34	35	Cloudy weather; wind south.
12	29.844	37	39	
4	29.710	42	43	
24, 8	29.210	44	45	Rain till noon, cloudy afterwards; wind north-west.
12	29.186	47	49	
4	29.330	48	48	

In concluding the observations at the Great Falls Observatory, it is proper to remark, that they were discontinued sooner than was intended, owing to misapprehension of one of the surveyors, who returned in charge of the canoes and party by way of the Great Falls to Frederickton. Having left the Commissioners intending to explore their way to Quebec, after penetrating to the extreme limits of the disputed territory, he concluded the operations to be completed, and carried Corporal Macgregor with those in his charge back to Frederickton.

The period, however, of the register at the Great Falls, includes all the important observations made on the line of the great axis of elevation from the head waters of the Penobscot and St. John's Rivers to Bathurst, in the Bay of Chaleurs.

Operations for determining the approximate height of Mars Hill. August, 1839.

Four barometers were selected for this purpose, viz.,—

Barometer B.

No. 1.

No. 377.

No. 376.

They were placed 3 feet above the floor in Pomphret's Barn, and having been allowed to remain a short time, until the mercury acquired nearly the temperature of the air, were carefully registered. The instruments were then conveyed to the summit of Mars Hill, and again observed, as also 5 feet below the summit, where they were obliged to be removed for shelter. Fires were lighted to obtain smoke to keep off the flies, but at such a distance as not to prejudice the observations.

The operations at the top of Mars Hill being completed, the barometers were again placed in the same position as before in Pomphret's Barn, and carefully read and registered. The detail is as follows.

Station.	Barometer.	Height.	Ther. A.	Ther. D.	Remarks.
At Pomphret's Barn near the River St. John, at the foot of Mars Hill, 10 A.M.	A.	29.391	18½ C.	18½	
	No. 1.	29.424	64 F.	65 F.	
	376	746.8	18 C.	18½ C.	
Summit of Mars Hill, 2 P.M.	No. 1.	28.087	66 F.	62 F.	
	373	711.3	18½ C.	16½ C.	
	376	711.9	18 C.	17 C.	
Five feet below summit, 2½ P.M.	No. 1.	28.098	66½ F.	62	
	373	712.5	17½ F.	16 C.	
	—	712.0	17 C.	16 C.	
	376	711.8	17 C.	16 C.	

OBSERVATIONS ON MARS HILL—(Continued.)

Station.	Barometer.	Height.	Ther. A.	Ther. D.	Remarks.
Five feet below the summit, 2nd Reading.	No. 1.	28·088	66½ F.	61½ F.	Fine weather, very warm; a brisk wind on the summit, which rendered it necessary to remove the barometers, at first placed against the wooden stage erected on the summit, into shelter five feet below.
	373	712·6	17 C.	16 C.	
	—	712·0	17 C.	16 C.	
Again at Pomphret's Barn 4 P.M.	376	711·8	17 C.	16 C.	
	No. 1.	29·553	69 F.	64 F.	
	373	749·7	18·5 C.	19 C.	
	376	750·0	18·5 C.	19 C.	

With reference to the important ulterior objects of the expedition, the visit to Mars Hill was performed with all the rapidity possible. The access to it is through woods and cedar swamps, the difficulties of which have occasioned more than one failure in the attempt. It became, therefore, expedient to convey only the lightest and most portable barometers to the summit; and Barometer A, being the heaviest, and most liable to injury, was left behind. An error occurred in the first register of Barometer No. 373, which was therefore excluded.

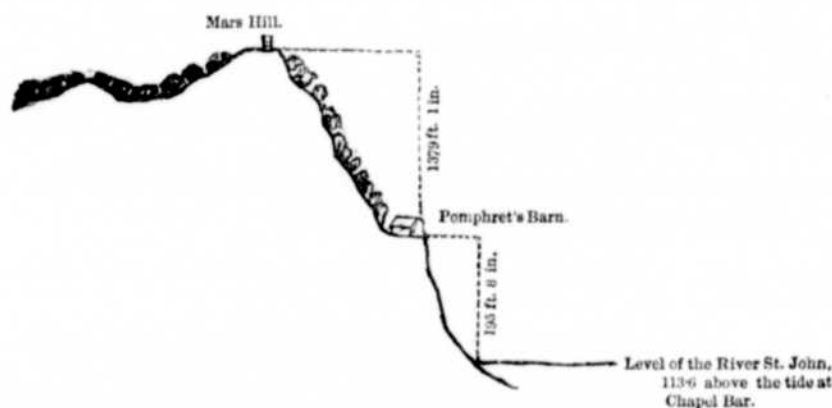
The result of the computations gives 1379 feet 1 inch from Pomphret's Barn to the summit of Mars Hill.

The height of Pomphret's Barn, above the River St. John, as ascertained by levelling by the Railroad Surveyors, was found to be 195 feet 8 inches.

And the height of the Rivière du Châte, above high water at Chapel Bar, 113 feet 6 inches.

The total height, therefore, of Mars Hill, above the tide at Chapel Bar, is 1688 feet 3 inches.

EXPLANATORY DIAGRAM.



Mr. Wightman was dispatched from the Great Falls, towards the Bay of Chaleurs, with a sufficient party, on the 8th of September, to explore the country, of which the Indians knew but little, and other information was almost entirely wanting.

He proceeded down the River St. John to the mouth of the Tobique. To the head of Nictau Lake, and thence to the Bay of Chaleurs, which he struck near the mouth of the Jaquet River. From that point he proceeded to Bathurst, a small fishing town in the Bay, and returned up the Middle River by the head of the Nictau Lake to the Great Falls, where, on the 14th of November, an opportunity offered of comparing the barometers he carried with him with the French Syphon Barometer 373, excepting No. 4, which had become unserviceable; when the accordance was remarkable and highly satisfactory, as follows:—

	Bar.	Height.	Th. A.	Th. D.
Nov. 14. Comparison of Barometers at the Great Falls, 14 feet below the observatory.	373	751·4	+ 1 C.	+ 2 C.
	377	751·3	+ 2	+ 2
	B.	29·576	35 F.	35 F.

Record of the Barometric Observations from the Mouth of the Tobique to the Bay of Chaleurs, and returning to the Great Falls.

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Sept. 10, 8 A.M.	At Poikok, on Tobique, 40 feet above the river.	B.	29·420	66 F.	19 C.	Wind south-west, moderate; some broken clouds.
		No. 4	29·448	68 F.	66½ F.	
		377	739·9	19	19	
12	On Tobique, 3 miles below Red Rapids.	B.	29·420	71 F.	21½ C.	Wind west-south-west, moderate; clear sky.
		No. 4	29·435	72 F.	68½ F.	
		377	747·	21¼ C.	21 C.	
4 P.M.	Mouth of Trout Brook, on Tobique, 15 feet above the river.	B.	29·380	69 F.	20¾ C.	Wind west-south-west; clear sky.
		No. 4	29·375	69 F.	70 F.	
		377	745·6	22 C.	21	
No corresponding observations for determining the above heights.						
Sept. 11, 8 A.M.	Four miles above Red Rapids, on Tobique, 20 feet above river.	B.	29·449	61¼ F.	16½ C.	Same as yesterday.
		No. 4	29·519	61 F.	63 F.	
		377	749·4	17¾ C.	16½ C.	
Height of the above station above the tide at Chapel Bar, 148 feet.						
12	Half a mile above Three Brooks, on the Tobique.	B.	29·453	62 F.	16¾ C.	Weather the reverse.
		No. 4	29·513	67 F.	61½ F.	
		377	748·7	17 C.	16¾ C.	
Height of the above station above the sea at Chapel Bar, 166 feet.						
4 P.M.	At Plaster Rocks, on the Tobique.	B.	29·404	61¼ F.	16¼ C.	Thunder shower at 7 o'clock, P.M.
		No. 4	29·447	..	..
		377	747·4	16 C.	..	
Height of the above station above the sea at Chapel Bar, 180 feet.						
Sept. 12, 8 A.M.	Eight miles above the Wapshoot, on the Tobique.	B.	29·503	53¾ F.	12 C.	Wind supposed west-south-west, not certain; tolerably clear; cloudy at 9 o'clock.
		No. 4	29·560	57 F.	54 F.	
		377	749·7	11¼ C.	11¼ C.	
No corresponding observations for determining the above height.						
12	At Banks Budeaux, three miles below Gulquat, on the Tobique.	B.	29·531	54 F.	12 C.	Cloudy, beginning to drop rain; cleared off at 3 P.M.
		No. 4	29·586	55 F.	52½ F.	
		377	751·0	..	12 C.	
No corresponding observations for determining the above height.						
4 P.M.	At mouth of the Gulquat, on the Tobique.	B.	29·522	58 F.	14¾ C.	Weather cloudy.
		No. 4	29·580	59½ F.	57½ F.	
		377	750·3	14¾ C.	13¾ C.	
No corresponding observations for determining the above height.						
Sept. 13, 8 A.M.	Two miles above Gulquat, on the Tobique.	B.	29·571	43 F.	44½ F.	Cloudy; wind north-west.
		No. 4	29·624	43½ F.	44½ F.	
		377	752·5	7 C.	6½ C.	
12	Same station.	B.	29·511	48 F.	48½ F.	Cloudy.
		No. 4	29·560	48 F.	49½ F.	
		377	751·6	9½ C.	9 C.	
4 P.M.	Same station.	B.	29·389	47½ F.	47¾	Cloudy.
		No. 4	29·434	48½ F.	48½ F.	
		377	751·6	8¾ C.	8½	
Height by mean of the three sets of observations, 331 feet.						
Sept. 14, 12	On Tobique, five miles above the last station.	B.	29·691	51 F.	54 F.	Clear weather; wind west.
		No. 4	29·758	50½ F.	52½ C.	
		377	755·8	12 C.	12 C.	
Height, 282 feet.						
4 P.M.	At Blue Mountair Brook.	B.	29·690	58 F.	59 F.	Ditto.
		No. 4	29·743	59½ F.	58 F.	
		377	755·0	15 C.	14¾ C.	

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Sept. 15, 8 A.M.	Same station.	B.	29·800	33 F.	36	Weather clear ; wind west.
		No. 4	29·845	32½ F.	32	
		377	757·8	+0½ C.	+2	
12	Top of Blue Mountain.	B.	28·502	59 F.	58 F.	Brisk south-west wind.
		No. 4	28·556	59½ F.	57½ F.	
		377	684·1	15 C.	14½ C.	
Height of the Blue Mountain, 1603 feet.						
4 P.M.	Mouth of Blue Mountain Brook.	B.	29·720	58 F.	59 F.	Brisk south-west wind ; cloudy.
		No. 4	29·772	59 F.	58 F.	
		377	755·2	14½ C.	14½ C.	
Height of the Blue Mountain Brook by mean of three sets of observations, 422 feet.						
Sept. 16, 8 A.M.	Same station.	B.	29·583	56½ F.	58 F.	South-west wind, and rain.
		No. 4	29·629	57½ F.	57 F.	
		377	752·0	14 C.	14 C.	
12	Three miles above Blue Mountain Brook.	B.	29·581	59½ F.	61	Wind south-west ; moderate, little, or no rain.
		No. 4	29·624	57½ F.	60	
		377	751·9	14 C.	17½	
Height, 467 feet.						
4 P.M.	Four miles below Nictau.	B.	29·532	59 F.	59 F.	Wind south-west ; moderate rain.
		No. 4	29·584	61 F.	59½ F.	
		377	750·6	15½ C.	14½ C.	
Sept. 17, 8 A.M.	Same station.	B.	29·586	56 F.	57 F.	Calm and rainy.
		No. 4	29·630	56½ F.	57 F.	
		377	752·	13½ C.	13½ C.	
12	Same station.	B.	29·578	58 F.	59 F.	Pretty heavy rain ; wind uncertain.
		No. 4	29·619	60 F.	58 F.	
		377	751·6	15 C.	15½ C.	
4 P.M.	Same station.	B.	29·568	59 F.	60 F.	Rain ceased ; calm.
		No. 4	29·615	61 F.	59 F.	
		377	751·6	15½ C.	15 C.	
Sept. 18, 8 A.M.	Same station.	B.	29·556	60 F.	58 C.	Wind north-east, very light, and rain.
		No. 4	29·594	60 F.	..	
		377	743·6	15 C.	..	
Height by mean of five sets of observations, 475 feet.						
12	Two Miles above North Fok.	B.	29·426	61 F.	60½ F.	Calm and cloudy.
		No. 4	29·482	61½ F.	60 F.	
		377	748·0	16½ C.	16 C.	
Height, 539 feet.						
4 P.M.	Eight miles up North Fork.	B.	29·726	60 F.	..	Wind north-east ; very light, and rain.
		No. 4	29·319	60 F.	58 F.	
		377	743·0	15 C.	..	
Height, 509 feet.						
Sept. 19, 7¼ A.M.	Nine miles up North Fork.	B.	29·005	58 F.	59 F.	Wind light, south- west ; weather clearing off ; slight rain from 4 P.M. yesterday till 11 to-day.
		No. 4	29·058	59 F.	59 F.	
		377	736·8	15½ C.	15½ C.	
Height, 586 feet.						
4 P.M.	First portage, about twenty miles from Nictau.	B.	29·048	57½ F.	57 F.	Beginning to clear off ; wind north- west, and very light.
		No. 4	29·099	60 F.	57 F.	
		377	738·1	14½ C.	13½ C.	
Sept. 20, 8 A.M.	Same station.	B.	29·258	48 F.	60 F.	Fine weather ; some light clouds ; wind north-west.
		No. 4	29·313	49½ F.	59½ F.	
		377	743·4	9½ C.	16 C.	
Height by mean of two sets of observations, 608 feet.						

Record of the Barometric Observations, &c.—(Continued).

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Sept. 20, 12	At second portage.	B.	29·224	60 F.	60 F.	Fine weather.
		No. 4	29·279	60½ F.	59½ F.	
		377	742·8	15½ C.	16 C.	
Height, 642 feet.						
4 P.M.	At Ambrose Bear's Camp.	B.	29·324	44 F.	60 C?	Calm and pleasant weather.
		No. 4	29·351	45 F.	43½	
		377	746·1?	7 C.	15 C?	
Sept. 21, 8 A.M.	At Ambrose Bear's Camp, 1½ miles below Cedar Brook.	B.	29·188?	61 F.	44 F.	Fine clear morn- ing; wind north- west.
		No. 4	29·288?	63½ F.	59 F.	
		377	741·8?	15½ C.	7 C.	
Height, 806 feet (doubtful).						
12	One mile above Cedar Brook.	B.	29·340	52½ F.	11 C.	Fine clear weather; wind north-east; fresh breeze.
		No. 4	29·375	59½ F.	53 F.	
		377		12½ C.	12 C.	
5½ P.M.	At Upper Forks.	B.	29·304	45 F.	45 F.	Fine clear weather; wind uncertain.
		No. 4	29·360	48 F.	44½ F.	
		377	745·1	8 C.	7½ C.	
Sept. 22, 8 A.M.	At Upper Forks, fourth portage.	B.	29·206	38 F.	39 F.	Slight rain.
		No. 4	29·250	39 F.	39 F.	
		377	737·7	4 C.	4 C.	
Height, by mean of two sets of observations, 663 feet.						
12	Two miles above Upper Forks.	B.	29·108	46 F.	48 F.	Brisk south wind and heavy rain; mercury sank ·018 of an inch in 15' after the observation.
		No. 4	29·051	46 F.	45 F.	
		377	737·3	8 C.	8½ C.	
Height, 528 feet (doubtful).						
Sept. 23, 8 A.M.	Two miles above Upper Forks.	B.	28·704	56½ F.	59 F.	Wind west-south- west; weather partially cleared up.
		No. 4	28·744	57 F.	57 F.	
		377	729·1	14½ C.	15 C.	
12	Same station.	B.	28·756	56 F.	55 F.	Weather the same; this day secured depôt of provi- sions from attacks of animals.
		No. 4	28·808	57½ F.	55 F.	
		377	731·0	14 C.	13 C.	
4 P.M.	Same station.	B.	28·794	56 F.	56½ F.	Fine weather.
		No. 4	28·840	57 F.	56 F.	
		377	731·9	14 C.	14 C.	
Height, by mean of three sets of observations, 703 feet.						
Sept. 24, 8 A.M.	Two and a half miles above Upper Forks.	B.	28·816	43 F.	..	
		No. 4	28·864	43½ F.	427	
		377	734·9	6 C.	..	
Height, 771 feet.						
12	Three miles below Nictau Lake.	B.	28·837	50½ F.	50 F.	Alternate sunshine and showers all day; wind south- west.
		No. 4	28·887	51½ F.	51 F.	
		377	733·2	11 C.	10 C.	
Height, 764 feet.						
4 P.M.	Head of Nictau Lake.	B.	28·804	49 F.	49 F.	
		No. 4	28·852	50½ F.	50 F.	
		377	732·3	10½ C.	9½ C.	
Height, 782 feet.						
Sept. 25, 8 A.M.	Head of Nictau Lake.	No. 4	28·917	39	36	Fine weather.
		377	733·9	2½		
		Height, 772 feet.				

Record of the Barometric Observations, &c.—(Continued).

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Sept. 25, 8½ A.M.	Near the top of Bald Mountain.	No. 4 377	27·258 691·0	41 F. 3½ C.	38 F. 3½ C.	Fine and clear sunshine all day; wind, light breeze south-west.
Height, 2,407 feet.						
9½ A.M.	Top of Bald Mountain.	No. 4 377	27·164 688·7	42½ F. 5½ C.	41 F. 5 C.	Height of Bald Mountain, 2,496 feet.
¾ P.M.	Near the top of Bald Mountain, as before.	No. 4 377	27·270 691·4	50 F. 8 C.	45 F. 7 C.	
2½ P.M.	Head of Nictau Lake.	No. 4 377	28·923 733·65	50½ F. 11 C.	50 F. 10½ C.	Height by first set . . . 746·2 Height by second ditto . . . 765·9 NOTE.—This second is to be preferred, the first observations not having been simultaneous with those at the Great Falls. The height will be further noticed.
4 P.M.	Same station.	B. No. 4 377	28·878 28·930 733·9	46 F. 49 F. 8½ C.	46 F. 46 F. 8 C.	
Sept. 26, 8 A.M.	Head of Nictau Lake.	B. No. 4 377	28·746 28·796 730·65	43 F. 43 F. 6½ C.	44 F. 43 F. 6½ C.	
12	Same station.	B. No. 4 377	28·602 28·654 726·9	47 F. 47½ F. 7½ C.	46½ F. 45½ F. 7½ C.	
4 P.M.	Same station.	B. No. 4 377	28·448 28·495 722·7	47½ F. 49½ F. 9½ C.	49½ F. 49½ F. 9½ C.	Continued rain; wind the same; ceased at 10 P.M.; wind came round to north-west, and a heavy gale.
This result is rejected on account of the peculiar conditions of the atmosphere.						Sept. 27, 8 A.M.
12	On rising ground three miles north-east from the head of Nictau Lake.	B. No. 4 377	27·958 28·008 710·3	46½ F. 48 F. 8½ C.	47 46½ 8½		Fine clear weather; brisk north-west wind.
Rejected also; the observations being discordant.						2 P.M.
4 P.M.	On the line, — miles from Nictau Lake, upon the ridge between Tobique and Nipisiquit waters.	No. 4 377	27·718 703·	51 9	47		Height, 2,092 feet.
4 P.M.	On the line, — miles from Nictau Lake, on a branch of the Nipisiquit.	B. No. 4 377	27·864 27·906 706·5	47 F. 49 F. 9 C.	48 F. 48 F. 9 C.	Wind south-west; fresh breeze; somewhat cloudy.
Sept. 28, 8 A.M.	Same station.	B. No. 4 377	27·962 28·003 710·5	32½ F. 34 F. + 0¼ C.	32 F. 32 F. 0 C.	Cloudy; no rain from 10 last night to 4 this morning; gale from south-west, with rain.
12	Same station.	B. No. 4 377	28·007 28·053 711·7	37 F. 38½ F. 3 C.	38 F. 37 F. 3 C.	Height from mean of three sets of observations, 1,718 feet.

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Sept. 28, 1½ P.M.	One mile north-east from last station, on a conical hill.	B.	27.696	36½ F.	36 F.	
		No. 4	27.758	36½ F.	36 F.	
		377	703.9	2½ C.	2 C.	
Height, 2,043 feet.						
3	Two miles from last station, on a small brook running to the right.	No. 4	28.063	42 F.	39 F.	Clear weather.
		377	711.0	6½ C.		
		Height, 1,722 feet.				
4	One mile from last station.	B.	27.608	36 F.	36 F.	
		No. 4	27.663	41 F.	35 F.	
		377	701.6	3 C.	2½ C.	
Height, 2,145 feet.						
Sept. 29, 8 A.M.	At a small brook running to the right.	B.	28.188	32 F.	30 F.	Fine clear weather; wind south-west.
		No. 4	28.239	32 F.	30 F.	
		377	716.6	1 C.	1 C.	
Height 1,729 feet. See above, 1,722 feet, and below, 1,716 feet.						
11½	Same station.	B.	28.208	38 F.	38 F.	Fine clear weather; wind south-west.
		No. 4	28.254	38 F.	37½ F.	
		377	717.2	3½ C.	3¼ C.	
Height, 1,716 feet. Mean height, 1,722 feet, by three sets of observations.						
1½ P.M.	One and a half mile from last night's station, on a very high peak.	B.	27.688	36 F.	37 F.	
		No. 4	27.715	40 F.	35 F.	
		377	703.2	2½ C.	2½ C.	
Height, 2,213 feet.						
3½	Two miles from last night's station, at a small stream descending rapidly to the right, valley running east.	B.	28.392	41 F.	41 F.	Cloudy throughout the day.
		No. 4	28.433	41½ F.	41 F.	
		377	721.7	5¼ C.	5 C.	
Height, 1,580 feet.						
6	At a valley descending south, on the side of a range of hills forming the division between Nipisquit and Upsalquatch waters.	B.	28.468	41 F.	41 F.	
		No. 4	28.500	44 F.	41 F.	
		377	722.5	5½ C.	5 C.	
Height, 1,508 feet.						
Sept. 30, 8 A.M.	Same station.	B.	28.576	26 F.	28 F.	Fine weather; wind west.
		377	726.2	- 2½ C.	- 2 C.	
		Height, 1,498 feet; and above, 1,508 feet. Mean height, 1,503 feet, by two sets of observations.				
9¼	One mile and a half east-north-east from last station.	B.	28.176	33½	32½ F.	Fine weather; wind south.
		No. 4	28.225	36		
		377	716.5	+ 1		
Height, 1,882 feet.						
12	Three miles from last station but one.	B.	28.040	39 F.	41 F.	
		No. 4	28.088	39½ F.	41 F.	
		377	713.	4 C.	5¼ C.	
Height, 2,045 feet.						
4 P.M.	At — miles from first station of this day, on a small brook running north-west.	B.	28.952	39 F.	38½ F.	
		No. 4	28.972	41 F.	38½ F.	
		377	735.7	4½ C.	3	
Height, 1,134 feet.						

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.			
Sept. 30, 5½ P.M.	On a small stream running south-east from first station of this day.	B.	28·620	37½ F.	38 F.				
		No. 4	28·660	42 F.	38 F.				
		377	727·5	4½ C.	3 C.				
Height, 1453 feet.									
Oct. 1, 8 A.M.	At a small brook running south from station, on side of range of hills dividing Nipisiquit and Upsalquatch waters.	B.	28·608	32 F.	32 F.				
		377	727·2	0 C.	0 C.				
		Height, 1469 feet.							
10	Two miles from last station, at a very small brook running to the right.	B.	28·940	37 F.					
		377	735·6	3½ C.					
		Height, 1154 feet.							
12	— miles from last station, on the head of a lumber road.	B.	28·982	45½ F.	35½ F.				
		377	736·2	8 C.	7½ C.				
		Height, 1143 feet.							
2 P.M.	At a lumber camp, on a stream running north.	B.	29·694	50 F.	50½ F.				
		377	754·5	11 C.	10 C.				
		Height, 495 feet.							
3	One and a half mile from last station, on top of land, the river being in a deep hollow.	B.	29·280	50 F.					
		Height, 873 feet.							
3½	Half a mile north of last station, on a hill.	B.	28·886	48 F.					
		377	732·1	10 C.					
		Height, 1195 feet.							
5½	One and a half mile north from last station.	B.	29·266	43½ F.	43 F.				
		377	743·5	7 C.	6 C.				
Oct. 2, 8 A.M.	Same station.	B.	29·140	40½ F.	42 F.	Fine weather; wind north-west.			
		No. 4	29·137	40 F.	40½ F.				
		377	740·8	6 C.	5½ C.				
5	Same station.	B.	28·956	50 F.	50 F.				
		No. 4	28·960	53½ F.	50 F.				
		377	735·7	10 C.	10 C.				
Mean height, 844 feet, by three sets of observations.									
12	On west branch of Apsalquatch River, half a mile above Forks.	B.	29·726	55 F.	58 F.	Looks like a storm.			
		No. 4	29·704	56 F.	57 F.				
		377	755·0	14 C.	14½ C.				
Height, 221 feet.									
Oct. 3, 4 P.M.	Three miles south-west, up a brook.	B.	28·792	50 F.	48½ F.	Rain; cleared off at noon.			
		No. 4	28·740	53 F.	49 F.				
		377	731·7	10½ C.	9½ C.				
Oct. 4, 8 A.M.	Same station.	B.	28·760	41 F.	41 F.	Rain all night; still raining.			
		No. 4	28·750	43 F.	41 F.				
		377	730·9	5½ C.	5 C.				
12	Same station.	B.	28·860	38 F.		Still raining.			
		No. 4	28·858	39 F.	37½ F.				
		377	733·2						

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Oct. 4, 4 P.M.	Same station.	B. No. 4 377	29·034 29·035 736·6	35 36 1 $\frac{3}{4}$	35 35 1 $\frac{1}{2}$	Thick snow storm.
Mean height, 725 feet, by four sets of observations. Owing to the disturbed condition of the atmosphere the results of this day do not accord very satisfactorily.						
Oct. 5, 8 A.M.	Three-quarters of a mile from last station.	B. 377	29·200 745·4	31 F. + 0 $\frac{1}{2}$ C.	30 F. - 1 C.	Fine weather; wind north-west.
1	Entrance of Ramsay's Portage Road, main south branch of Upsalquatch, six and a half miles above Falls.	B. 377	30·068 764·0	42 F. 5 $\frac{1}{4}$ C.	42 F. 5 $\frac{1}{2}$ C.	
Height, 271 feet.						
4	Ramsay's Camp, foot of little south-east branch.	B. 377	29·810 757·4	40 F. 3 C.	36 F. 3 C.	Fine weather; wind north-west.
Oct. 6, 7 $\frac{1}{2}$ A.M.	Same station.	B. 337	29·976 762·1	22 5	22 5	
Mean height, 541 feet, by two sets of observations.						
10	Two miles east of Ramsay's Camp.	B. 377	29·420 747·8	35 F. 2 C.	36 F. 2 C.	
Height, 1,048 feet.						
1 $\frac{1}{2}$ P.M.	Four and a half miles east of Ramsay's Camp, in a chasm 300 or 400 feet deep.	B. 377	29·800 757·1	51 F. 11 C.	50 $\frac{1}{2}$ F. 9 $\frac{1}{4}$ C.	
Height, 743 feet.						
3 $\frac{3}{4}$	One mile and a half east of last station on top of a hill.	B. 377	29·054 737·5	55 F. 12 $\frac{1}{2}$ C.		
Height, 1,432 feet.						
5 $\frac{1}{2}$	One mile east of last station but one.	B. 377	29·100 739·0	45 F. 7 C.		
Oct. 7, 6 $\frac{1}{2}$ A.M.	Same station.	B. 377	28·896 734·1	28 F. 1 $\frac{3}{4}$ C.	28 $\frac{1}{2}$ F. 2 C.	
Mean height, 1,327 feet, by two sets of observations.						
8	One mile east of last station.	B. 377	28·700 729·5	39 F. 1 $\frac{3}{4}$ C.	28 $\frac{1}{2}$ F. 2 C.	
1 $\frac{2}{3}$ P.M.	Five miles east from last station.	377	736·6	10 $\frac{1}{2}$ C.		Cloudy, with light wind, all the latter part of the day.
4	Seven and a half miles from first station of this day.	B. 377	28·992 736·4	52 F. 11 $\frac{1}{4}$ C.	52 F. 11 C.	
Height, 1,218 feet.						
5 $\frac{3}{4}$	Edge of the River Jacquet.	B. 377	29·732 755·4	49 F. 10 C.		
Oct. 8, 7 $\frac{3}{4}$ A.M.	Same station.	B. 377	29·782 756·8	47 F. 8 $\frac{3}{4}$ C.		
Height, 406 feet.						
8 $\frac{1}{2}$	Fifty feet below top of bank above last station.	B. 377	29·260 743·7	50 F. 13 $\frac{1}{4}$ C.		Cloudy, with very light west wind.
Height, 887 feet.						

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Oct. 8, 12	At a brook in a deep ravine running west.	B. 377	29·609 752·2	53 F. 12½ C.	53 F. 11½ C.	
	Height, 631 feet.					
4 P.M.	North side of Blue Moun- tain.	B. 377	29·076 739·0	57½ F. 14½ C.		
	Height, 1,064 feet.					
10	One mile north-west of camp on Jacquet River. Hill considerably higher on the left.	B. 377	29·106 739·7	55 F. 13½ C.		Fine clear weather; wind north.
	Height, 1,044 feet.					
Oct. 9, 8 A.M.	Two miles north-north- west of camp on Blue Mountains.	B. 377	29·242 742·9	45 F. 7 C.		
	Height, 820 feet.					
12	Two miles north-west of last station.	B. 377	29·312 744·7	48½ F. 9 C.		
4 P.M.	Same station.	B. 377	29·226 742·4	37½ F. 8½ C.		
	Mean height, 779 feet, by two sets of observations.					
Oct. 10, 8 A.M.	Three miles from yester- day's Camp, near Big- hole Brook.	B. 377	29·280 754·0	47 F. 8½ C.	47 F. 47 C.	
	Height, 1,318 feet.					
12	Postage road leading from Nash's Creek, two miles back from main shore road.	B. 377	29·696 754·4			
	Height, 172 feet.					
5½ P.M.	Bay des Chaleurs, four miles below Jacquet River, thirty feet above sea level.	B.	29·846	49		
Oct. 11, 8 A.M.	Former station on Bay des Chaleurs.	B.	30·140	38 F.		
	Observation doubtful, and rejected.					
Oct. 13, 12	Bathurst (Bay des Chaleurs) on a hill eighty feet above the sea level.	B. 377	28·849 758·0	56 F. 14½ C.	58 F. 58 C.	
4 P.M.	Same station.	B.	29·788	61	62	
Oct. 14, 8 A.M.	Same station.	B. 377	30·149 766·1	54 12½		
	Height of Observatory at the Great Falls, above the Bay des Cha- leurs, by mean of all the observations and barometers, 467 feet.					
Oct. 15, 5 P.M.	Eight miles up Middle River ascending from Bay des Chaleurs to the Great Falls.	B. 377	29·896 759·4	43 F. 6 C.		Clear weather; light north-west wind.
	Height, 154 feet.					
Oct. 16, 8½ A.M.	Falls of Middle River.	B. 377	29·844 757·8	44 F. 8 C.		
	Height, 390 feet.					

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Oct. 16, 11½ A.M.	At Burnt Camp.	B. 377	29-669 753-7	57 F. 14 C.		
			Height, 559 feet.			
2½ P.M.	Camp two miles north-west of Burnt Camp.	B. 377	29-470 749-0	60 F. 15½ C.		
			Height, 699 feet.			
4½	Ferguson's Lower Camp.	B. 377	29-350 745-5	56 F. 13 C.		Brisk west wind; and cloudy.
			Height, 801 feet.			
Oct. 17, 6½ A.M.	Same station.	| 377 |	743-1	| 9 C. |		
			Height, 791 feet.			
9	Ferguson's Upper Camp.	B. 377	29-214 741-9	56 F. 13 C.	55 F. 55 F.	
			Height, 842 feet.			
11½	Ferguson's Upper Camp, as before.	B. 377	29-196 741-9	62 F. 16½ C.	60 F. 60 F.	
			Height, 791 feet. Mean height, 795 feet, by two sets of observations.			
4½ P.M.	Camping Place.	B. 377	28-606 735-8	56 F. 13 C.	55 F.	
			Height, 1,067 feet.			
Oct. 18,	Above Ferguson's Upper Camp, going up Middle River.	B. 377	29-036 737-55	40 F. 4½ C.	40 F. 40 F.	
			Height, 985 feet.			
10½ A.M.	Two miles west of last station.	B. 377	18-896 733-7	39½ F. 4½ C.		
			Height, 1,135 feet.			
12	Three quarters of a mile west of last station.	B. 377	28-730	40 F.		
1 P.M.	At Large Brook, quarter of a mile west of last station.	B. 377	29-006 737-0	42 F. 6 C.	42 F. 42 F.	Weather very thick and cloudy.
Oct. 19, 8 A.M.	At Large Brook, miles above Ferguson's Upper Camp.	B. 377	29-890 734-2	36 F. 2½ C.		
			Height, 928 feet.			
10	On a hill.	| 377 |	723-8	| -2 C. |		
			Height, 1318 feet.			
11½	On top of a range of hills running south-west.	| 377 |	717-7	| +1 C. |		
			Height, 1,539 feet.			
1 P.M.	(No locality specified.)	B. 377	28-430 722-2	33 F. +0½ C.		
			Height, 1,369 feet.			
3	(No locality specified.)	| 377 |	713-4	| +2 |		
			Height, 1,712 feet.			

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Oct. 19, 4 P.M.	(No locality specified.)	B. 377	28·508 724·2	32 F. 0		
			Height, 1,300 feet.			
Oct. 20, 7½ A.M.	(No locality specified.)	B. 377	28·728 729·7	20 F. -6½ C.		
			Height, 1,330 feet.			
8½	Three-quarters of a mile west of last station; 100 feet below top of hill.	377	725·5	-6 C.		
			Height, 1,485 feet.			
10½	In a small brook running south.	377	733·4	-3 C.		
			Height, 1,266 feet.			
11	Top of an irregular ridge.	377	725·5	-4 C.		
			Height, 1,559 feet.			
2¼ P.M.	Top of a ridge.	B. 377	28·164 715·5	26 F. -4 C.		
			Height, 1,977 feet.			
4	At a ravine running west into a deep valley on the right.	B. 377	28·958 735·7	26½ -3½		
			Height, 1,237 feet.			
Oct. 21, 8 A.M.	Same station.	B. 377	29·188 741·2	25 F. +3½ C.		
			Height, 1,188 feet.			
8½	North side of ridge.	377	735·5	-3 C.		
			Height, 1,408 feet.			
12	No locality named.	B. 377	29·650 735·7	30 F. -1 C.		
			Height, 839 feet.			
4½ P.M.	Head of Upsalquatch Lake.	B. 377	29·664 753·4	29 C. -1½ C.		
			Height, 750 feet.			
Oct. 22, 7½ A.M.	Same station.	B. 377	28·350 720·2	30 F. -0½ C.		
			Height, 758 feet.			
9½	Mountain half a mile west from Upsalquatch Lake.	B. 377	28·350 740·6	35½ F. +1½ F.		A snow squall; but after the observation.
			Height, 1,707 feet.			
½ P.M.	Brook running into Nipisquit.	B. 377	29·150 740·6	35½ F. +1½ C.		
			Height, 1,034 feet.			
1½	Large brook running south-east.	B. 377	29·040 737·65	35 F. +2 C.		Brisk westerly wind.
			Height, 1,064 feet.			

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Oct. 23, 7 $\frac{1}{2}$ A.M.	Same station.	B. 377	29·162 740·8	22 $\frac{1}{2}$ F. -4 $\frac{1}{4}$		
			Height, 1,009 feet.			
			NOTE.—This discordance with the foregoing is owing to neither of the observations being simultaneous with those at the Great Falls.			
11	Top of a conical hill.	B. 377	27·884 708·3	30 F. -1 C.		Day mild and cloudy; wind west in the forenoon; in the afternoon south; and rain at night.
			Height, 2,186 feet.			
12	In a battery.	B. 377	28·642 729·3	-34 +1 $\frac{1}{2}$		
			Height, 1,500 feet.			
4 $\frac{1}{2}$ P.M.	At a brook.	B. 377	28·986 736·4	43 F. +6 $\frac{1}{4}$ C.		
			Height, 1,020 feet.			
Oct. 24, 8 A.M.	At a brook.	B. 377	28·470 724·0	41 F. +5		Rain till noon; cloudy afterwards; wind north-west (at Great Falls).
			Height, 1,059 feet.			
10	At a large brook.	B. 377	28·536 725·1	43 F. -6 $\frac{1}{4}$		In the morning, wind south; at noon, changed to north-west, and blew smartly; heavy rain till 3 o'clock, P.M.
			Height, 590 feet.			
Oct. 25, 1 $\frac{1}{2}$ P.M.	Head of Nictau Lake.	B. 377	29·338 745·5	44 F. 7 C.		
4 $\frac{1}{2}$ P.M.	Same station.	B. 377	29·346 745·5	38 $\frac{1}{2}$ F. 3 $\frac{1}{2}$ C.		
Oct. 26, 8 A.M.	Same station.	B. 377	29·321 745·2	32 +0 $\frac{1}{4}$		Cloudy morning.
			Height, 780 feet.			
			The above height is deducted from observations made on the Queen's Wharf at Quebec; the barometers referred to each other being distant 250 miles. The same height obtained by former observations referred to the Great Falls; (the barometers, in those cases, being distant about 60 miles from each other,) is as follows:—			
			785 feet.			
			772			
			765			
			782			
			785			
			Mean 777 feet.			
Oct. 27, 12	At Bare's Camp.	B. 377	29·200 751·5	53 $\frac{1}{2}$ F. 12 $\frac{1}{2}$ C.		
4 P.M.	Lower Portage on the Nictau stream.	B. 377	29·236 741·2	52 F. 12 $\frac{1}{4}$ C.		
Oct. 28. (No time stated).	Same station.	B. 377	19·228 742·3	43 F. 6 $\frac{1}{2}$ C.		Weather hazy.
(No time stated).	Ridge on south side of river.	B. 377	28·482 723·5	46 F. 9 $\frac{1}{2}$ C.		
11 $\frac{1}{2}$ A.M.	Side of river, one mile below Portage.	B. 377	29·220 742·1	46 F. 8 $\frac{3}{4}$ C.		
Oct. 29, 8 A.M.	Forks of Nictau Lake.	B. 377	29·254 743·4	43 F. 6 $\frac{1}{2}$ C.		

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.	
Oct. 29, 12	Five miles below Nictau, 8 feet above water.	B. 377	29·300 744·1	47 F. 8½ C.		Calm and cloudy all day; begins to clear off.	
4 P.M.	Same station.	B. 377	28·890 736·2	47½ F. 8½ C.			
Oct. 30, 8 A.M.	Same station.	B. 377	28·930 734·9	38½ F. 39½ C.			
	At Halley Brook.	B. 377	28·894 734·1	42½ F. 6 C.			
3½ P.M.	On a ridge.	B. 377	28·742 729·8	42 F. 5 C.			
	On the declivity of a hill.	B. 377	28·858 733·0	35 F. +2 C.			
9½ A.M.	On height of land.	B. 377	28·600 726·8	40½ 5			
Height, 1,513 feet.							
Oct. 31, 7 A.M.	Same station.	B. 377	28·852 732·6	35 +2			
8	One mile south-west of last station.	B. 377	28·860 728·8	36 +3			
9½	On flat land.	B. 377	28·802 731·5	38 3½			
10	On height of land.	B. 377	28·720 729·7	38 F. 4 C.			
	At Beddel's Camp.	B. 377	28·748 730·0	36 3½			
Nov. 1, 7½ A.M.	At Forks of Cedar Brook.	B. 377	29·200 741·4	32 F. 0 C.			
Height, 651 feet.							
8½	Half a mile north-west of Fork.	B. 377	29·008 737·0	34 F. +1 C.			
Height, 826 feet.							
8½	Three-quarters of a mile from Forks.	377	735·7	+2 C.			
Height, 873 feet.							
12	At Perkins Brown's, branch of Little River.	B. 377	29·136 740·0	36½ F. 2½ C.			
Height, 718 feet.							
3½ P.M.	At branch of Little River.	377	745·7	+4 C.			
Height, 519 feet.							
Nov. 2, 8 A.M.	On the road, four miles from Michaux.	B. 377	29·402 746·8	30 F. -1 C.			
Height, 577 feet.							
Subsequent to the 26th of October, the heights given are mere rough approximations; the observations at the Great Falls having been discontinued, as before observed. The thermometric register is also deficient, owing to both the detached thermometers having been broken. The correction in such cases for the strata of air has been therefore merely conjectural.							

On a review of the above register, and of the results obtained therefrom, it will be seen that the most remarkable are the inferences respecting the difference of level between the sea at high water in the Bay des Chaleurs, and the same in the Bay of Fundy, and the height of Nictau Lake as deduced from the Great Falls, and subsequently from Quebec.

The particulars of the first have been already detailed, and it will not, therefore, be necessary to recapitulate them here; but a small diagram is annexed explanatory of the results obtained, and intended to represent a section of the country from Chapel Bar to the Great Falls, distant about 120 miles, and from thence to Bathurst in the Bay des Chaleurs, about the same distance; the former part of the section being in a direction north-east, and the latter to the north of west:—



Showing a barometric difference of altitude between high water mark, in the Bay des Chaleurs and Chapel Bar in the River St. John, in the Bay of Fundy, of 77 feet.

The second case is equally remarkable, and not the less worthy of observation.

The height of Nictau Lake, one of the sources of the Tobique River, was ascertained by barometrical measurement, made during several successive days in the latter part of September, to have an altitude above high water, at Chapel Bar, of 777 feet, by reference to the fixed barometer at the Great Falls.

One month subsequently, viz., on the 26th of October, an opportunity offered of comparing the same height with that obtained from Quebec, at high water mark in the River St. Lawrence. The result so obtained, 786 feet, leaves little room to desire a more satisfactory proof of the fidelity of the whole series of observations, and of the just deductions stated in the Report, that the line of maximum elevation is continuous from the south of the river Rostook to the Bay of Chaleurs. The following section is nearly in a direct line a little to the west of north from Quebec to the Nictau Lake, and south-west from Nictau Lake to Chapel Bar:—



Barometric observations for determining the height of the Observatory at the Great Falls.

The Barometers used for this purpose were as follows:—

A	
B	
No.	
	1
	2
	3
	4
	373
	374
	376
	377

On the 2nd of September the above barometers were carefully read and registered in the Observatory, and the temperatures of the attached and detached thermometers also taken.

Barometer A was left stationary in the Observatory, and the remainder conveyed to the basin below the Great Falls, where they were placed in a sheltered position, five feet above the water, and carefully registered.

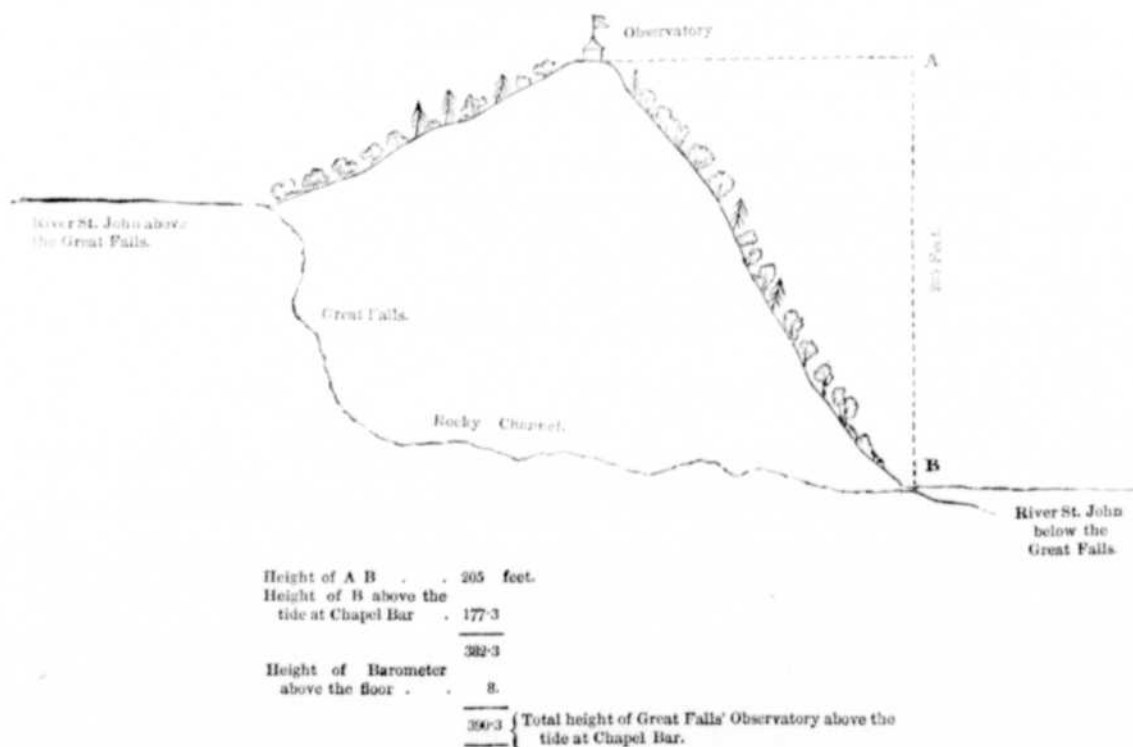
They were afterwards replaced, as soon as possible, in the Observatory, and the register repeated. The difference in the reading before and after the removal and replacement was trifling. The following is a detail:—

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.
Sept. 2, 3 P.M.	In the Observatory at the Great Falls, three feet above the ground.	A.	29.740	24 C.	20½ C.
		B.	29.712	23 C.	20½ C.
		No. 1	29.735	68½ F.	70
		2	29.739	68½ F.	72
		3	29.720	67½	70
		4	29.746	68	70
		373	754.7	21 C.	21
		374	754.8	21 C.	21
		376	755.2	21 C.	21
		377	754.75	21 C.	21
" 5 P.M.	Five feet above the River, below the Great Falls.	B.	29.790	24 C.	
		No. 1	29.881	76 F.	73½ F.
		2	29.838	76½ F.	73½ F.
		3	29.812	78½ F.	73½ F.
		4	29.838	79 F.	73½ F.
		373	756.8	23 C.	23 C.
		374	756.85	23½ C.	23 C.
		376	757.3	23 C.	23 C.
		377	757.25	24 C.	23 C.
		" 5½ P.M.	In the Observatory above the Great Falls, after the foregoing observations.	A.	29.730	22½ C.	22 C.
B.	29.680			21½ C.	22 C.
No. 1	29.717			74 F.	75 F.
2	29.737			74 F.	75 F.
3	29.695			74½ F.	75 F.
4	29.718			72½ F.	75 F.
373	754.15			20 C.	18½ C.
374	754.3			20 C.	18½ C.
376	754.3			20 C.	18 C.
377	754.3			20 C.	18 C.

Height of the Observatory at the Great Falls above the River below the Great Falls,
205 feet.

DIAGRAM.



Having made every arrangement for exploring the disputed territory, with the intention of penetrating through the same to its utmost western limits, the Commissioners and party, with the remaining barometers, left the Great Falls on the 9th of September, and arrived at Tobique, a station occupied by a military store and a few dwelling-houses, nearly opposite the river of that name, the same night.

The station of Tobique is distant about six miles from the termination of the portage road, cut as a communication between the rivers St. John and Roostuck, the confluence of the latter with the former being about five miles north of the confluence of the Roostuck with the St. John.

A short distance from the junction of the Roostuck with the St. John, the navigation is interrupted by falls of no great elevation, but quite impassable. It became, therefore, necessary to transport the canoes by a portage cut for the purpose. The Commissioners and party traversed the portage road from Tobique to the river Roostuck above the Falls, conveying the instruments by hand; and they established their first camp at the termination of the portage, about a mile distant from Fort Fairfield,—a work of some strength, recently erected by the State of Maine, to command the access to the Roostuck.

A wanton and unprovoked attack had been made on this fort two nights preceding by a party of lumberers, unfortunately led on by persons of superior station, who had provided themselves with arms by breaking open the Government store at Tobique. The attack was prevented before it could take effect, by the watch-fires of the Americans, which betrayed the approach of the hostile party who fled, after receiving and returning the fire of the sentry, leaving behind some of their arms in their hurry to escape.

This unforeseen and untoward occurrence appeared to threaten at first a serious, if not a total, interruption to the proceedings and arrangements, of the Commissioners. It had been publicly known, and stated to the Governor of Maine, that their intention was to penetrate into the interior of the disputed territory by way of the Roostuck; and their arrival at that river, and consequent passage under the walls of the fort, had been fixed and intended for the day on which the meditated attack took place. Some delay in collecting all the canoes had, however, fortunately occurred, to detain the party at the Great Falls beyond the expected time, and the good sense of the Commander of Fort Fairfield at once led him to perceive, that the Commissioners, and those under their orders, had no connection with the parties who endeavoured to commit this lawless, mischievously-timed, and unjustifiable aggression.

Having politely received the visit and explanation of the Commissioners, he ordered the boom to be raised which obstructed the navigation of the river; and on the following day, viz. the 11th of September, the party passed the barrier.

It may appear superfluous to remark, that the orders to the Commissioners being special, and limited to one object, it was no part of their duty to make a reconnoissance of a military character, or to examine into the construction or strength of Fort Fairfield; but statements having been made in the American newspapers, implying that their operations had reference to the future establishment of military posts, it becomes necessary to state, that, in profiting by the passport of the Governor of the State of Maine, and by the politeness of the Commandant of Fort Fairfield, they felt themselves precluded from making the slightest examination into the nature of its defences.

Before leaving the camp it had been determined to explore to the summit of a hill immediately above the Falls of the Roostuck, and evidently connected in its character with the heights on the opposite side, the connection being interrupted by the river which is precipitated over the ledge of rocks forming the junction. The top of the hill was as usual covered with tall trees, and from the summit of one, bearings were taken in several directions.

Record of Barometric Observations made at the First Camp on the Roostuck.

Date.	Station.	Bar.	Height.	Th. A.	Th. D.
Sept. 11, 8 A.M.	First Camp on the Roostuck, six miles above the confluence with the River St. John. The Falls intervening.	A.	29·142	14½ C.	14½ C.
		No. 2	29·524	58 F.	58 F.
		3	29·491	58 F.	58 F.
		373	748·55	14½ C.	14½ C.
		374	748·96	15 C.	14½ C.
		376	748·1	14½ C.	14½ C.
Height, 180 feet.					
" 1 A.M.		376	748·5	18 F.	18½ C.
" 2	Two miles below the Camp, five feet above the River.	376	749·0	18 C.	18½ C.
" 2½	Summit of Hill.	376	734·85	18 C.	18½ C.
		..	735·35	..	..
" 4	At Camp on return.	..	747·4	18 C.	18½
Height, 710 feet.					

Heavy rain coming on, accompanied with a strong wind which agitated the surface of the river, to an extent to threaten danger to the heavy loaded canoes, the party halted earlier than was intended.

The camp was formed on the right bank of the river, below the confluence of the little Madawasca which falls in on the opposite side. Night had closed in, accompanied with continued heavy rain and wind, before their party and stores could be placed under shelter.

The following day the expedition proceeded and made considerable progress, though some delay was occasioned by one of the Indians, who found that the labour required was more unremitting and constant than was consistent with the ordinary habits of the savage tribes, whose exertions, when driven by hunger to obtain subsistence, usually terminate with the acquirement of a sufficiency for present wants. At the remonstrance, however, of the other excellent Indian guide, he was at last induced to proceed, though he never afterwards proved either a diligent or useful auxiliary. The proceedings and daily advancement were uninterrupted, until the arrival of the party at the Forks of the Roostuck, so termed by the junction of the rivers Milenekak and Manasawgun, being the channels of two of the sources of the Roostuck, which, from that point, loses its name.

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Sept. 13, 6 A.M.	Camp on Roostuck, ten feet above the right bank of the River.	*374	753·85	+ 3 C.	+ 4 C.	
		373	753·7	3 C.	4 C.	
Height, 291 feet.						
7½	Top of Hill, distant two miles.	373 374	734·3 734·75	5½ C. 5½ C.	6 C. 6 C.	Temperature of air, at 10½ A.M., +11 C.; Ditto of river, +9 C.; no fog or mist; cloudy but clear.
8½	Again at Camp.	373	753·6	7 C.	6 C.	
10½	.. ..	374	754·0	7 C.	6 C.	
Height, 918 feet.						
Sept. 14, 1 A.M.	At the foot of a Hill, on the right bank of the Roostuck.	373	755·2	13½ C.	13½ C.	Temperature of air, at 6 A.M., 26½ F.; Ditto, —1½ C.; ice and hoar frost.
		376	755·7	13½ C.	13½ C.	
1½	On the summit.	373 376	745·05 745·35	12½ C. 12½ C.	12 C. 12 C.	
2	Again at the foot of the hill, as before.	373 376	755·25 755·60	14½ 14½	14 C. 14 C.	
6	Summit of Hill, height 678 feet. Camp, 288 feet.					
Sept. 15, 7 A.M.	.. ..	..	..	..	..	Temperature of air, 28 F.
		373 376	751·25 751·3	16½ C. 16½ C.	60 F. 60 F.	
9	.. ..	..	..	..	..	Temperature of air, 59°; ditto of River, 54°.
Height, 625 feet.						
Sept. 16, 3½ P.M.	Foot of Hill, on River Roostuck.	373	750·0	16½	60½ F.	
		376	750·3	16½	60½ F.	
4	Top of Hill.	373 376	747·1 747·45	16½ C. 16½ C.	60 F. 60 F.	
4½	Again at foot of Hill.	373 376	750·1 750·15	16 C. 16 C.	60½ F. 60½ F.	
Summit of Hill, height 654 feet.						
Sept. 17, 12½	On River Roostuck.	373	749·75	17½ C.	17 C.	
		376	750·2	17½ C.	17 C.	
Height, 537 feet.						

* Barometer No. 374 was broken this day in one of the canoes.

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Sept. 17, 1 P.M.	Summit of Hill above the River on the right bank.	373	739.5	16 C.	16 C.	
		376	740.1	16 C.	16 C.	
Height, 912 feet.						
8	At the Camp, six miles above St. Croix.	373	749.8	12½ C.	13½ C.	
		376	750.2	12½ C.	13½ C.	
		A.	29.545	13 C.	13½ C.	
		No. 2	29.570	55½ F.	58 F.	
		3	29.531	55½ F.	56½ F.	
Height, 554 feet.						
10½	.. .. .	..	..	..	..	Temperature of air, 58° F.; ditto of river, 55°.
Sept. 18, 8 P.M.	Camp on the Roostuck, right bank (called Po- tatoe Camp.)	A.	29.469	56 F.	53 F.	
		No. 2	29.495	55 F.	54½ F.	
		3	29.471	55 F.	53 F.	
11 P.M.	.. .. .	373	747.9	12½ C.	12½ C.	Temperature of air, 57°; ditto of wa- ter, 57°. Rain all the after- noon and night; wind south-west, and very little of it.
		376	748.3	12½ C.	12½ C.	
Height, 565 feet.						

The party arrived at the forks of the Roostuck, formed by the junction of the Millenakak and Manasawgun Rivers, on the 19th of September.

For the preceding three days the state of the main river had given warning, that the navigation would thereafter become difficult, so as to render the ascending to either, or both, of the sources of the above-named tributaries hard, if not impracticable. But the fulfilment of the chief objects of the expedition altogether depending on the successful accomplishment of the undertaking, the Commissioners had no alternative, and first attempted the Millenakak, the southernmost of the two, with a small squadron of the light canoes and a few axemen, leaving the strength of the party at the forks to await their return.

The character of the Millenakak proved to be a succession of shoals and rapids, requiring great strength and skill to propel the canoes against the force of the stream, at the same time rendering proportionate care indispensable, to avoid the numerous rocks which everywhere abound.

The ordinary log canoes, constructed by hollowing out a single tree, are capable of receiving severe shocks with comparatively little injury; but the frail Indian bark canoes, made of the lightest materials for carriage across the portages, and covered with a single sheet of birch bark, are easily damaged by collision, and soon destroyed. The stream, shortly after leaving the forks, began to assume the character of a mountain torrent, here and there further embarrassed by the accumulation of huge trunks of trees, carried down by the floods at the annual melting of the snow. These barriers occasionally extended completely across the river, entirely blocking up the passage. Where they consisted of only a few trees, by dint of hard labour and the vigorous application of the axe, a channel was cut through just wide enough for the canoes to pass; and in the case of too great an accumulation of fallen timber to permit of that expedient, it became necessary to unload and drag them over the obstruction. After overcoming a succession of such difficulties, the ascent of the Millenakak to a large lake at its source was length attained. Barometric observations were made on the following morning at the camp, which had been formed on the east side of the lake.

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.
Sept. 20, 8 A.M.	Camp on the east side of the Lake Millenakak.	373	741.35	12 C.	12½ C.
		376	742.0	12 C.	12½ C.
Height, 678 feet.					

The return down the river was not accomplished without an equal proportion of risk and exertion. The descent was more rapid, but more dangerous, the rapidity of the stream being as difficult to control in descending, as it had been to surmount in the ascent. The canoes were frequently half filled with water, and one was actually swamped, but so near to the margin of the river that it was easily forced towards the shore, and soon emptied.

At length arriving at the camp at the forks, the Commissioners had the satisfaction of finding the party they had left there refreshed by the rest; and an Indian, who had refused to accompany them up the Millenekak, professing to be sick and unable to move, well enough to proceed on the following day. This was the same Indian before alluded to; and, although no doubt he was fatigued with the constant labour of the preceding nine days, it was suspected that his illness was more assumed than real, and proceeded either from fear or indolence, probably from a mixture of both.

On the 21st of September, the expedition proceeded to explore the second tributary to the Roostuck, the river Manasawgun, which, after a repetition of difficulties and obstructions similar to those experienced on the Millenekak, they happily accomplished. The subsistence of the party altogether depended on the success of the attempt, the expenditure of provisions having proved greater than was expected, with no other prospect of a fresh supply than such as was *hoped* to be found at the lake Wallagasquigum, yet some days journey distant.

The following Thermometric Observations were made during the ascent of the river, with a view to infer the proximity of the lakes, which were known to form its source, by the expected increase of temperature of the larger body of fresh water, their actual position being conjectural and inferred only from the Indian statements.

8 A.M.	Temperature of Air	. . .	49°
	River	. . .	54
11.	Temperature of Air	. . .	49
	River	. . .	57
4 P.M.	Temperature of Air	. . .	50
	River	. . .	59
* 5½.	Temperature of Air	. . .	45
	River	. . .	60

At the camp on the lake on the following morning, September 22;

7 A.M.	Temperature of Air	. . .	45°
9½.	Ditto	. . .	48
	Water	. . .	57

The party having succeeded in arriving at the third lake above the Manasawgun, prepared to ascend to the summit of a mountain above it on the following day. Barometric Observations were accordingly made as here detailed.

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Sept. 23, 8½ A.M.	Camp on 3rd Lake above the River Manasawgun.	A.	28·75	55 F.	55 F.	
		No. 2	28·749	56½ F.	57 F.	
		3	28·690	56½ F.	56½ F.	
		373	728·2	13 C.	55½ F.	
		376	728·8	13 C.	56 F.	
Height, 676 feet.						
12½	Top of mountain.	A.	27·638	53 F.	53 F.	
		No. 2	27·685	56 F.	56 F.	
		3	27·632	56 F.	56 F.	
		373	701·45	12½ C.	12½ C.	
		376	701·65	12½ C.	12½ C.	
Height, 1,833 feet.						
3 P.M.	Near the top, descending.	376	707·0	12 C.	12 C.	
		373	706·6	12 C.	12 C.	
Height, 1,636 feet.						
6	At bottom of mountain on the portage at Camp.	A.	28·822	12 C.	10½ C.	
		No. 2	28·867	57 F.	53 F.	
		3	28·815	55 F.	50 F.	
		373	731·0	10½ C.	10½ C.	
		376	731·5	11 C.	10 C.	

* Lake half a mile distant.

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Sept. 24, 8 A.M.	Same station.	A.	28·886	44	44	
8 $\frac{1}{2}$	.. .. .	No. 2	28·915	43 $\frac{1}{2}$	44	Temp. of air, 47° water, 50 (Still water ascending from Lake.)
		3	28·862	43 $\frac{1}{2}$	44	
		373	732·8	7	7	
		376	733·5	7	7	
Sept. 26, 8 A.M.	At Camp near the brook running to the north, being the dividing line of the waters, running south-west into the Manasawgun and Roostuck, and north-west to the 4th Lake (Wallagasquigwam) and Allegash.	A.	28·462	8 $\frac{1}{2}$ C.	8 C.	
		No. 2	28·502	47 $\frac{1}{2}$ F.	46 $\frac{1}{2}$ F.	
		3	28·445	..	..
		373	722·0	8 $\frac{1}{2}$ C.	8 $\frac{1}{2}$ C.	
		376	722·85	8 $\frac{1}{2}$ C.	8 $\frac{1}{2}$ C.	
Height, 1,059 feet.						

Subsequently to commencing the ascent of the Manasawgun River, not a little anxiety had been felt and expressed by some of the party to obtain intelligence of the expedition dispatched from the Great Falls, under the charge of Captain Hansard, of New Brunswick, who had been recommended by Sir John Harvey to convey a stock of provisions up the River St. John to the mouth of the Allegash, and thence up that river to Lake Wallagasquigwam.

Captain Hansard, with a party of French canoemen from the Settlement of Madawaska, and an experienced Indian guide, had left the Great Falls the day following the departure of the Commissioners, with a supply of provisions for their future use. His instructions were to proceed up the St. John's to the confluence of the Allegash, and to explore that river to its source, which was known to be the Lake Wallagasquigwam, or Fourth Lake, being the most remote of a series of lakes from its mouth.

To this point the Commissioners intended to penetrate by means of the Roostuck, with its lakes and portages. They took with them what was deemed to be an ample allowance of salt pork and biscuit, to accomplish that object, and to subsist the party until they should receive a fresh supply, which was to be deposited by Captain Hansard in a small island, nearly in the middle of Lake Wallagasquigwam. Although every precaution had been taken in ascending the Roostuck to prevent a wasteful expenditure of the provisions, the consumption was much greater than had been expected. On arriving at the head waters of the Roostuck they became nearly exhausted, and some intelligence of the arrival of the party dispatched from the Great Falls, by way of the Allegash, was anxiously looked for. Although no doubt was originally entertained that the navigation of the Allegash would be found perfectly practicable, yet it could not be considered as altogether certain, within the projected time, at least, as the river was very low for the season, and fallen timber or some like contingency, to which such expeditions are liable in countries little known, might have occurred to impede altogether or delay its progress to a serious extent.

It was not, therefore, without great satisfaction to the leaders, and a more noisy expression of joy from others, that the first signals of relief were heard. The distant reverberation, caused by the discharge of two muskets, which came from the expected direction, and the appearance within a few hours afterwards of two scouts dispatched by Captain Hansard two days in advance, to meet the party expected in an opposite direction, gave great satisfaction to all. This was further increased by the information that two moose had been killed, one of them of such a size as to secure a future supply of fresh meat, a luxury duly appreciated by those who had been subsisting up to that period on salt provisions only. The Commissioners immediately pushed forward with a small squadron of light canoes to join Captain Hansard, chiefly for the purpose of sending back, with as little delay as possible, a sufficient supply to maintain the party, who had yet some difficult portages and navigation to perform before they could arrive at the shores of the Lake Wallagasquigwam.

This lake, from its elevated position and size, is subject to great agitation from the force of wind. On the night of the arrival of the Commissioners on the beach opposite to where Captain Hansard's encampment had been made, a storm occurred from the north-west, to render the passage hazardous: they accordingly bivouacked close to the margin, and effected their purpose on the following morning. They found on their arrival the relief party, well posted in a spot abounding with hard wood for firing sufficient for several days. The island which had been originally fixed on for the purpose did not prove large enough, or contain wood proper for fuel. No fatal accident occurred to any of the party in crossing this dangerous sheet of water, though such an event had nearly happened.

The canoe conveying the Commissioners' servants was upset nearly in the middle, and but for the presence of mind of the parties, and the ready and judicious aid afforded by the two corporals of the Royal Sappers and Miners, who were also crossing in a canoe at no great distance, they must inevitably have been drowned, the water exceeding in all probability forty feet in depth, and the distance from either shore a mile and a half. The doleful cry which announced the misfortune first drew attention to the spot, and the desperate condition of the suffering parties, soon became evident by means of a telescope. They were, however, rescued, as has been stated, and afterwards brought to the shore, by the aid of a party who proceeded as quickly as possible to their relief, without any other injury than cold and exhaustion. One of the barometer stands and some articles belonging to the Commissioners went to the bottom; but they were the less regretted, as in addition to the probable loss of life, it was at first believed that all their valuable papers, clothes, and such baggage as they possessed, had shared the same fate.

A similar incident occurred on the following day to Captain Hansard and one of the Indians. A moose, supposed to be the dam of one of the two shot a few days previously, had been heard bellowing at a distance. In searching for it near the shore of the lake, the discharge of the gun upset the canoe. The Indian not being able to swim, a circumstance very unusual with the savage tribes, was on the point of being drowned but for Captain Hansard, who saved his life by assisting him to support himself on the bottom of the canoe, and safely conveyed him to the shore, after the lapse of half an hour. They were both greatly exhausted, and suffering extremely from cold on arriving at the camp.

The camp on Lake Wallagasquigwam offered the means of repose and rest which had become necessary, as also for concerting future operations. The barometers were placed in a secure and permanent position for observation, at the periods named for the like purpose at the Great Falls. The results are as follows:—

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Sept. 28, 8 A.M.	Camp on Lake Wallagasquigwam, or Windy, or 4th Lake.	A.	28.974	2½ C.	2½ C.	Temperature of air, 6 A.M., 35° C.
		No. 2.	29.021	36½ F.	38 F.	
		3	28.890	36½ F.	34 F.	
		373	735.9	3 C.	2½ C.	
		376	736.2	3 C.	2½ C.	
12	Same station.	A.	29.062	6 C.	4½ C.	
		No. 2.	29.080	44 F.	43 F.	
		3	29.016	43½ F.	43 F.	
		373	736.8	5¼ C.	4½ C.	
		376	736.65	6 C.	4½ C.	
4 P.M.	Same station.	A.	29.060	5½ C.	4½ C.	
		No. 1.	29.088	43 F.	42 F.	
		3	29.039	41 F.	42 F.	
		373	736.9	5 C.	4¼ C.	
		376	737.05	5 C.	4¼ C.	
Sept. 29, 9½ A.M.	Same station.	A.	29.180	6½ C.	4½ C.	Temperature of air, 6 A.M., 29° F.
		No. 1.	29.220	44 F.	43 F.	
		3	29.140	41½ F.	40½ F.	
		373	740.1	6½ C.	4½ C.	
		376	740.0	6½ C.	4½ C.	
12	Same station.	A.	29.191	8½ C.	7 C.	
		No. 2.	29.235	49½ F.	46½ F.	
		3	29.175	47½ F.	44½ F.	
		373	740.8	8½ C.	7¼ C.	
		376	740.9	8½ C.	7¼ C.	
4 P.M.	Same station.	A.	29.182	8½ C.	6½ C.	
		No. 2.	29.230	45½ F.	45 F.	
		3	29.179	45½ F.	43 F.	
		373	740.5	7 C.	6½ C.	
		376	740.1	7 C.	6½ C.	
Height, 868 feet.						
Sept. 30, 8 A.M.	Same station.	A.	29.316	+3½	+3	Temperature of air, 6½ A.M., 27 F.
		No. 2.	29.372	37	37	
		3	29.321	36½	37	
		373	744.0	+3	+3	
		376	744.1	+3	+3	

Oct. 1, 6½ A.M. Temperature of Air, 33°
 1 P.M. " " 45
 " " Lake, 53

The party having obtained the necessary rest at the lake, and future operations having been determined, two divisions were formed, one to explore to the north as far as the head waters of the Penobscot; the other to proceed down the river Allegash, and to ascend the St. John's, from its confluence to the Lake Woolastaguam, where a rendezvous was appointed, and expected to take place within a fortnight.

Some of the canoemen with their canoes were here discharged and ordered to return to the Great Falls, and thence to Frederickton.

The navigation of the Allegash, which had been found difficult by the party ascending it from the Great Falls, became still more so in the descent, owing to the low state of the waters usual towards the close of the autumn, when they have their minimum height for the year. At the debouchement of the Allegash from the lake, and about two miles below it, a formidable rapid was passed by portage, and another occurred shortly afterwards, which much damaged one of the canoes, but the navigation was effected without other injury as far as the termination of a chain of lakes, when it became necessary to abandon the damaged canoe, transferring the men belonging to it to one of those which had been intended to be discharged.

From the termination of the above-mentioned chain of lakes, forming the head waters of the Allegash, to the falls of that river, a continued series of rapids and shoal water alternates with occasional deep pools and still water. Some of the rapids are formidable and the velocity great. The falls of the Allegash, although not so considerable as the Great Falls of St. John, either in their height or in the volume of water precipitated over its bed, are yet an impassable barrier, and the canoes and instruments, as also the provisions, were transported across a portage to the river below the falls.

At some distance below the falls are again rapids, a succession of which continues nearly to the confluence of the river with the St. John's: one of them is both difficult and dangerous. Five canoes were swamped in this rapid, and one dashed to pieces amongst the rocks. The men escaped with a few bruises only. An Indian, the same who was the subject of particular notice before, and who was so nearly drowned in Lake Wallagasquigam, became so much alarmed, that he totally lost all self-possession, and declared himself unable to manage his canoe, which was transferred to another. This is not the fault of the Indians generally; they are brave and skilful, and by far the best conductors, both for intelligence and with reference to personal safety.

From the confluence of the Allegash to the exit of the St. John's River from the Lake Woolastaguam, the navigation is subject to few serious interruptions, as far up as a group of islands, the Indian name of which is Unsesevaqui, and passable without damage to canoes with tolerable skill and care; but above the islands to the lake at the head of the eastern branch of the St. John's, it is of the worst possible description, and to one, not intent on overcoming difficulties, and unused to such a species of navigation, would appear insurmountable, there being no other means of progress, the woods being impenetrable even to an Indian dog till the snow falls; the ascent of the river was therefore accompanied with much difficulty, and the injury to the canoes, especially to those belonging to the Indians, was to a serious extent.

On Sunday, the 13th of October, this branch of the expedition succeeded in reaching the point of rendezvous, and accomplished a meeting as projected, having been anticipated by the party who went south to the head waters of the Penobscot, and were anxiously expecting them, their provisions being nearly expended; though they were fortunately relieved from the fear of actual starvation by having succeeded in killing a fine moose. Two noted Indian hunters were also fallen in with, who had been successful with moose, beavers, and water-birds of various kinds, so that supplies were thenceforward in abundance.

Register of the Barometer from Lake Wallagasquigam, descending the Allegash and ascending the River St. John, to the Lake Woolastaguam.

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Oct. 2, 8 A.M.	First Camp, at the foot of the portage, below the Lake Wallagasquigam.	376 ..	741·3 741·2	6 C. 6 C.	42 F. 42 F.	
			Height, 831 feet.			
11	.. ..	..	..	..	..	Temp. of Air, 46° " River, 51
Oct. 3, 8 A.M.	At Camp, about twenty miles below the Lake on the Allegash.	376 ..	732·75 732·9	8½ C. ..	47 F. ..	
			Height, 731 feet.			
3 P.M.	.. ..	..	..	..	..	Temp. of Air, 49° " River, 50

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Oct. 4, 8 A.M.	Camp above the Falls of the Allegash.	376 ..	734·9 734·9	8½ C. ..	39 ..	
			Height, 637 feet.			
9½	.. ..	..	..	..	..	Temp. of air, 40°; wind north-west; cold with snow and sleet. The ther- mometer could not be held with safety in the water, owing to the rapidity of the stream.
Oct. 5, 8 A.M.	Camp on the right bank of the St. John's River, half a mile above the Confluence of the Alle- gash.	376 ..	755·45 755·5	-1½ C. -1½ C.	30 F. ..	
7 P.M.	.. ..	..	..	..	..	Temp. of air, 27° F.
10½	.. ..	..	..	..	..	Temp. of river, 42° .. air, 32
			Height, 515 feet.			
Oct. 6, 8 A.M.	At Camp, ten miles above the Confluence of the Allegash, on the River St. John.	376 ..	760·75 760·75	-4 C. -4 C.	25 F. ..	
6½ P.M.	.. ..	..	..	..	..	Temp. of air, 21½° F.
			Height, 574 feet.			
Oct. 7, 8 A.M.	At Camp on St. John's River.	376 ..	753·45 753·4	-0½ C. -0½ C.	31 F. ..	
			Height, 659 feet.			
Oct. 8, 8 A.M.	At Camp on St. John's, about ten miles above the Great Black River.	376 ..	748·2 748·2	7½ 7½	46 ..	
1 P.M.	.. ..	..	..	..	..	Temp. of air, 58° .. river, 46
			Height, 712 feet.			
Oct. 9, 8 A.M.	Camp on St. John's, north of the Islands Unseveva- que. (Beaver Camp.)	376 ..	744·2 744·2	11 C. 11 C.	53 F. ..	
2½ P.M.	.. ..	..	..	..	..	Temp. of air, 60° .. river, 52
			Height, 830 feet.			
Oct. 10, 8 A.M.	Camp on St. John's River, estimated ten miles above the Islands.	376 ..	735·0 735·0	9½ C. 9½ C.	50 ..	
			Height, 855 feet.			
Oct. 11, 8 A.M.	Camp, estimated half a mile below the Forks, formed by the confluence of the Metawaquem River with the St. John.	376 ..	739·75 739·75	-3½ C. -3½ C.	25 F. ..	
			Height, 910 feet.			
Oct. 12, 8 A.M.	Camp on St. John's, ten miles above the Forks.	No. 2	29·118	29 C.	32 F.	
			Height, 952 feet.			
Oct. 13, 8 A.M.	Camp on St. John's, esti- mated three miles below the Lake Woolastiqui- guam.	376 ..	729·15 729·1	8 C. ..	46½ F. ..	
			Height, 1,049 feet.			

Record of the Barometric Observations, &c.—(Continued.)

Date.	Station.	Bar.	Height.	Th. A.	Th. D.	Weather, &c.
Oct. 13, 11½ A.M.	.. .. .	..	..	..	..	Temp. of river, 45°
11¾	Lake Woolastaquagam.	No. 3 373	28·650 727·8	55 F. 14 C.	55 14 C.	
Height, 1,075 feet.						

Register of Barometric Observations from Lake Wallagasquigwam to the Head Waters of the Penobscot and Lake Woolastaquagam.

Date.	Station.	Bar.	Height.	Th. A.	Th. D.
Oct. 1, 8 A.M.	At the south-west end of the Portage between the Allegash and Penobscot Waters.	No. 3 373	28·692 728·45	47 F. 8 C.	47 F. 8 C.
" 9½	Middle of the Portage.	No. 3 373	28·659 727·50	51 F. 10½ C.	50 F. 10 C.
Height, 1,301 feet.					
Oct. 4, 8½ A.M.	On top of a hill, 1½ miles west of Camp or Portage between Allegash and Penobscot waters.	No. 3 373	28·357 719·75	41 F. 3½ C.	38¾ F. 3¼ C.
" 10	At the Camp on Return.	No. 3 373	28·825 731·8	43½ F. 6½ C.	42½ F. 6 C.
Height, 1,150 feet (doubtful).					
Oct. 6 6½ A.M.	On Sea Gull Lake.	No. 3 373	29·533 750·6	23 F. -4 C.	23 F. -4 C.
" 10	On Small Lake at the head waters of the Penobscot.	No. 3 373	29·625 752·3	43½ F. 6 C.	43 F. 5½ C.
Oct. 7, 3¾ P.M.	Top of a hill 72½° west of Camp on the head waters at the Penobscot River.	No. 3 373	27·951 709·7	52 F. 11 C.	51 F. 11 C.
Height, 2,158 feet.					
" 8, 10 A.M.	At the foot of the hill visited before.	No. 3 373	28·970 735·5	55 F. 14 C.	55 F. 14 C.
Height, 1,300 feet.					
" 9, 10½	On top of the ridge visited on the 7th.	No. 3 373	28·404 720·9	54 F. 12 C.	53 F. 12 C.
Height, 1,680 feet.					
" 10, 9¼	Extreme Source of St. John's River above Lake Woolastaquagam.	No. 3 373	28·457 722·6	51 F. 10½ C.	51 F. 10½ C.
Height, 1,315 feet.					
" 11, 8	Portage above Lake Woolastaquagam.	No. 3 373	28·649 727·60	32 -0½	32 -0½
Height, 1,349 feet.					

Register of Barometric Observations descending the River St. John, from Lake Woolastaguam to Lake Echemin.

Date.	Station.	Bar.	Height.	Th. A.	Th. D.
Oct. 15, 8, A.M.	Camp on St. John's descending river, from Lake Woolastaguam.	No. 3 373	28·991 736·4	45½ F. 7½ C.	45½ F. 7½ C.
" 3 P.M.	Same station.	No. 3 373	28·973 735·8	53 F. 13¼ C.	56½ 13¼
" 8	Near the same place below.	376 ..	737·2 737·0	9 C. 9 C.	42 ..
Height, 1,065 feet.					
Oct. 17, 9 A.M.	Forks of St. John's and Metawaquem.	No. 3 373	29·096 738·9	47 F. 9 C.	47 F. 9 C.
Height, 929 feet.					
Agreeing nearly with results, obtained from observations made on the 11th instant, in ascending to the lake; the former station being a short distance below.					

Having arrived at the Forks of the Metawaquem, a small river, tributary to the St. John's, the extreme source of which is near the western extremity of the disputed territory, it was proposed to proceed by ascending that river, and by portage through the woods separating it from Lake Echemin, and, gaining that lake, to proceed thence to Quebec.

The greater proportion of men and canoes were therefore here discharged, and placed under the care of Mr. Wilkinson, to return to the Great Falls by the River St. John, and thence to Frederickton, the Commissioners reserving for their own use only such as were necessary to proceed to the head of the Metawaquem, with a sufficiency of provisions to take them to Lake Echemin, the first settlement beyond the limits of the disputed territory.

The portage through the woods, from the head of the river Metawaquem to the Lake Echemin, being effected, it became obvious that the chief objects of the expedition had been attained only just in time to avoid being caught in the forest by the rigours of the fast approaching winter. The leaves had mostly fallen from the trees, and the first view of a clearing, as they gained the shore of Lake Echemin, presented to them a surface covered with snow still continuing to fall, accompanied with severe cold, which announced the close of the hitherto favourable season.

Barometric Observations at Lake Echemin.

Date.	Station.	Bar.	Height.	Th. A.	Th. D.
Oct. 20, 10 A.M.	At Lake Echemin, thirteen feet above the water.	No. 3 376	29·201 741·7	31 F. +½	36 F. +2
Height, 957 feet.					
Oct. 21,	On top of hill on Quebec road, the highest visible point of the chain of hills, claimed by the Americans as highlands.	376	736·05	+1	+3
Second Reading ditto.					
Height 1,212 feet.					
Barometer 373, and No. 3, were put up, but not registered, air being detected in both.					
Oct. 21,	On the 22nd of October, the Commissioners arrived at Quebec, and waited on his Excellency the Right Honourable Poulett Thompson, who had just landed from Her Majesty's ship Pique.				

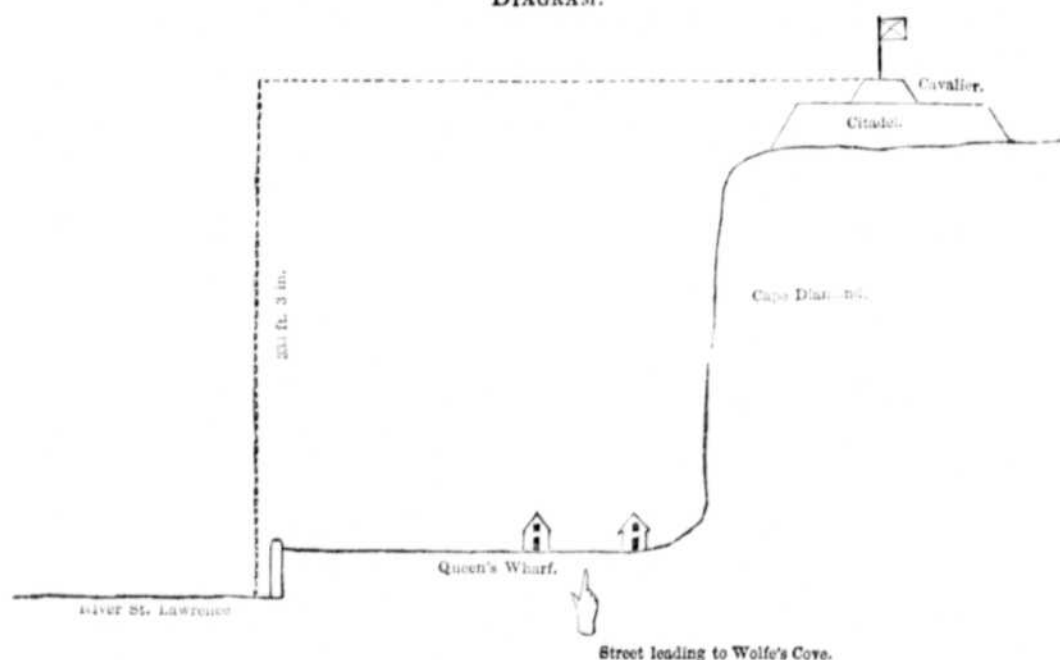
Register of Barometric Observations made at Quebec.

Date.	Station.	Bar.	Height.	Th. A.	Th. D.
Oct. 26, 12.	At Quebec, on the Cavalier, in the Citadel on Cape Diamond, 3 feet above the Platform, ascertained to be 333 feet 3 inches above the Platform; this was selected as being the highest known point.	A.	29·872	51½ F.	50 F.
		No. 2	29·891	51½ F.	50 F.
		No. 2	29·440	54 F.	52 F.
		..	29·440	54 F.	52 F.
		376	758·45	11 C.	50 F.
		..	758·40	11 C.	50 F.
" 2½ P.M.	On Queen's Wharf, nine feet above high water, in the River St. Lawrence.	No. 2	30·235	57 F.	50 F.
		376	767·25	14 C.	54½ F.
		..	767·2	14 C.	54½ F.
		..	767·4	14 C.	54½ F.
		..	767·2	14 C.	54½ F.
" 1½	Again on the Cavalier in the Citadel.	No. 2	29·882	60½ F.	56½ F.
		376	758·0	13½ C.	55 F.
		..	758·05	13½ C.	55 F.
		..	758·0	13½ C.	55 F.
		..	758·05	13½ C.	55 F.
Oct. 30, 2½	On Queen's Wharf, Quebec, same place before.	No. 2	29·737	53 F.	46 F.
		..	29·733	52 F.	45 F.
		..	29·733	50½ F.	44½ F.
		376	758·1	8 C.	44½ F.
		..	758·15	7 C.	43 F.
		..	758·1	7 C.	43 F.
" 3¼	On the Cavalier on the Citadel, as before.	No. 2	29·529	45 F.	40 F.
		..	29·535	44½ F.	40 F.
		..	29·526	44 F.	41 F.
		..	748·9	5½ C.	39 F.
		..	748·9	5 C.	39 F.
		..	749·0	6 C.	39 F.
		..	749·2	6 C.	39 F.
		..	749·1	6 C.	39 F.
Oct. 30, 4	On Queen's Wharf, as before.	No. 2	29·866	44 F.	43 F.
		..	29·866	44 F.	43 F.
		..	29·875	44 F.	43 F.
		376	758·1	6½ C.	42½
		..	758·5	6½ C.	42½
		..	757·7	6½ C.	42¼
Nov. 1, 2, P.M.	At Quebec, sixty feet above the River St. Lawrence.	376	760·7	17½ C.	63 F.
..	..	760·5	17½ C.	63 F.	
Nov. 2, 9	Same station.	No. 2	30·140	62 F.	62 F.
		376	764·05	16½ C.	62 F.
		..	764·01	16½ C.	62 F.
" 11	Same station.	No. 2	30·125	57 F.	59 F.
		376	763·95	16 C.	62 F.
" 3½	Same station.	376	762·9	16½ C.	62 F.
" 4	Same station.	No. 2	30·076	55 F.	59 F.
		376	762·75	16 C.	62 F.
Nov. 3, 10	Same station.†	376	764·65	16 C.	60 F.
" 11	"	..	764·45	16 C.	60 F.
" 12	"	..	764·4	16 C.	60 F.
" 1½, A.M.	"	..	764·1	16 C.	69 F.
" 2½	"	..	763·8	16 C.	60 F.
" 4	"	..	763·65	16 C.	60 F.
Nov. 6, 10½	Same station.	No. 2	29·856	50	53
		376	757·0	12½	53
" 12½ P.M.	"	No. 2	29·748	50	53
		376	758·8	12½	53
" 2	"	No. 2	29·705	50	53
		376	753·6	12¼	53
" 3	"	No. 2	29·106	50	53
		376	751·3	12	53

Height of the Platform on the Citadel of Quebec.

By First Series . . .	331 feet.
By Second do.	332 feet.
By Measurement	333 feet 3 inches.

DIAGRAM.



Register of Barometric Observations made on the River St. Lawrence on the Metise, and at the Great Falls.

Date.	Station.	Bar.	Height.	Th. A.	Th. D.
Oct. 30,	At the mouth of the Melese River, on the St. Lawrence.	No. 3 373	29·817 757·34	42 F. 2½ C.	35½ 2 C.
Nov. 2, 1½ P.M.	On the Metise river.	No. 3 373	28·974 742·55	32 F. 0 C.	32 F. 0 C.
Nov. 3, 12	Large Lake Melese.	No. 3 373	29·416 740·7	30 -1	30 -1
Nov. 4, 10 A.M.	Last Lake of Metise.	No. 3 373	29·130 740·0	-30 -1	-30 -1
Nov. 7,	On the River St. Lawrence, at the mouth of the Metise River.	No. 3 373	29·224 742·5	72½ F. 22 C.	72? F. 22 C.
Barometer No. 3, broke by accident.					
Nov. 11, 2¼	On St. Francis River.	373	743·4	70 F?	7 C.
	Hill at Temisconta Portage.	373	725·2	-3 C.	-4 C.
" 9	Top of hill.	373	725·3	-6 C.	-6 C.
Nov. 12, 7½	Lake Temisconta.	373	754·25	-9 C.	-9 C.
	At Madawaska.	373	755·45	-9 C.	-9
Nov. 14,	At the Great Falls, fourteen feet below the standard barometer in the Observatory.	B. 373 377	29·576 751·4 751·3	35 +1 +2	35 +2 +2

On examination of the above observations it is apparent, that such a discrepancy exists between some of them, the barometers not agreeing with each other, that it would lead to an erroneous conclusion, to infer the heights from such discordant sources only; they are therefore chiefly derived from other means, as detailed in the Report.

Having protracted their proceedings in the country, as before detailed, and as long as the season would permit, pursuant to their instructions, the Commissioners lost no time in proceeding to New York, and from thence to England.

In submitting this detail of the barometric reconnoissance of the disputed territory, it is not intended to insist, that the observations and results are the most perfect that could have been made under any circumstances. A slight examination of the map will show, that the elevations determined apply to a distance upwards of 250 miles in length, viz.—from the Bay of Chaleurs to the head waters of the Penobscot. Owing to the pressing emergency of the case, two months only of open season could be devoted to the examination, including all the difficulties of exploring an almost unknown region, not admitting of celerity of movement, by the total want of roads, or the use of animals for transport of any kind.

Under these circumstances it would be obviously presumptuous to pretend, that the results are, in all cases, absolutely correct, even as far as the nature of barometers will allow.

But as the difference between the real and assumed elevation of the starting point at the Great Falls is no less than 1500 feet, and as the assumption of the American highlands, at the lake Metise result from that assumed difference, it was not a *small quantity* which was required to be determined.

Barometers of a far inferior construction to those employed for the purpose, and observations far more loosely made, and less carefully registered, would have been amply sufficient to determine the existence, or non-existence, of the assumed facts.

Were not the proofs ample to show, as ascertained by the corresponding height of the Great Falls, deduced barometrically from the Bay of Chaleurs, and by actual level from the tide at Chapel Bar, that the atmospheric influences, in the lower strata at least, are continuous and correspondent over a considerable space of the earth's surface, it might be supposed that the distance of the standard barometer at the Great Falls was, in most cases, too great for comparison within reasonable limits of accuracy. This is, no doubt, the fact to a certain extent. An examination of the simultaneous observations at the Great Falls, and at other distant places, with the intervals between them, will make manifest that an error must frequently result from the differences of condition of the atmosphere, then prevailing at the respective places. But a similar investigation will also prove, that in no case did such a want of accordance exist, to render the argument of a continuous line of maximum elevation liable to dispute, beyond comparatively insignificant limits.

The British Association for the Advancement of Science have instituted a series of barometric observations, including the record of other atmospheric phenomena, which has been carried on uninterruptedly and hourly, day and night, for a period exceeding three years. The results have demonstrated a prevailing law which is found to affect the height of the mercurial column, between the morning and evening observations. They are not yet made public; but an opportunity has offered of testing some of the observations made at the Great Falls by this law, and it is found that the same inferences are deduced in both cases. It will hereafter be expedient, with the permission of Her Majesty's principal Secretary of State for the Foreign Department, to examine analytically the whole series of observations made in the disputed territory, with a view to lay them before the scientific world in a more mature form than is now practicable.

It is only necessary to observe further, that whatever might have been the result, obtained by establishing the standard barometer at the Great Falls, it was the only place in or near the disputed territory, the actual height of which had been previously determined, or could be ascertained; and that after personal examination of the district, experience has shown it to be the best which could have been selected, even had a more perfect knowledge of the country existed before commencing the operations.

The barometric observations as detailed are complete and faithful copies from the original registers, in the hand-writing of the respective parties, which are deposited in the Foreign Office.

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