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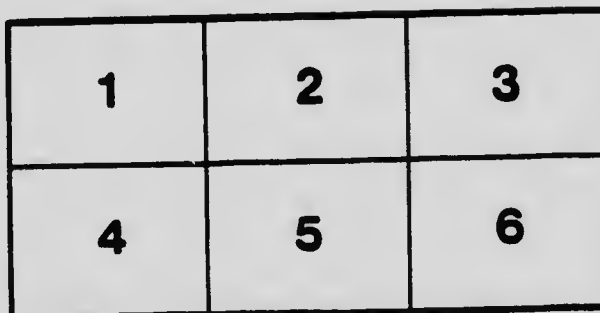
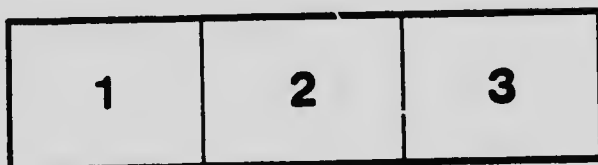
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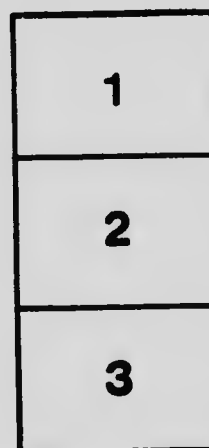
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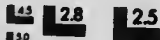
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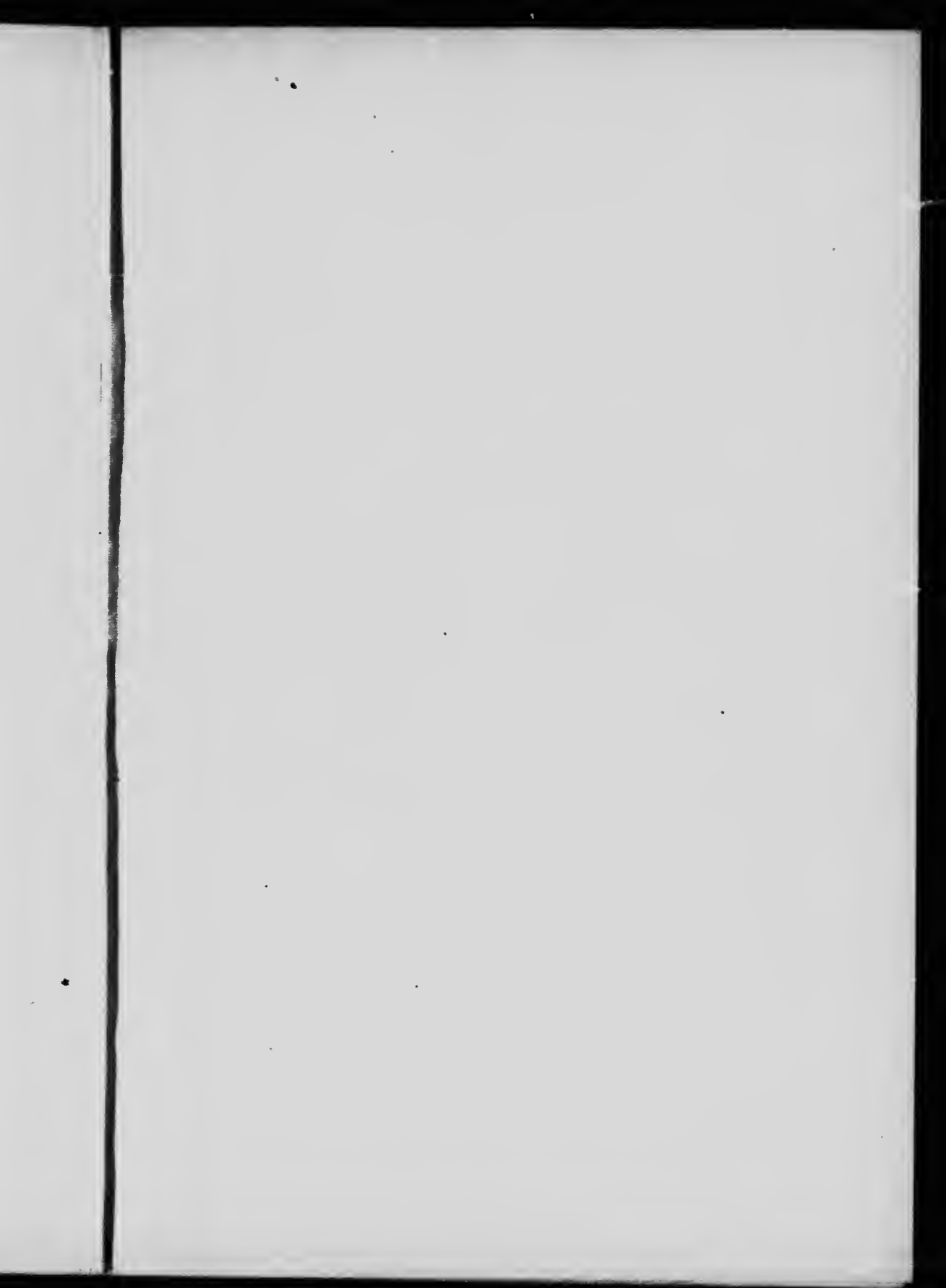
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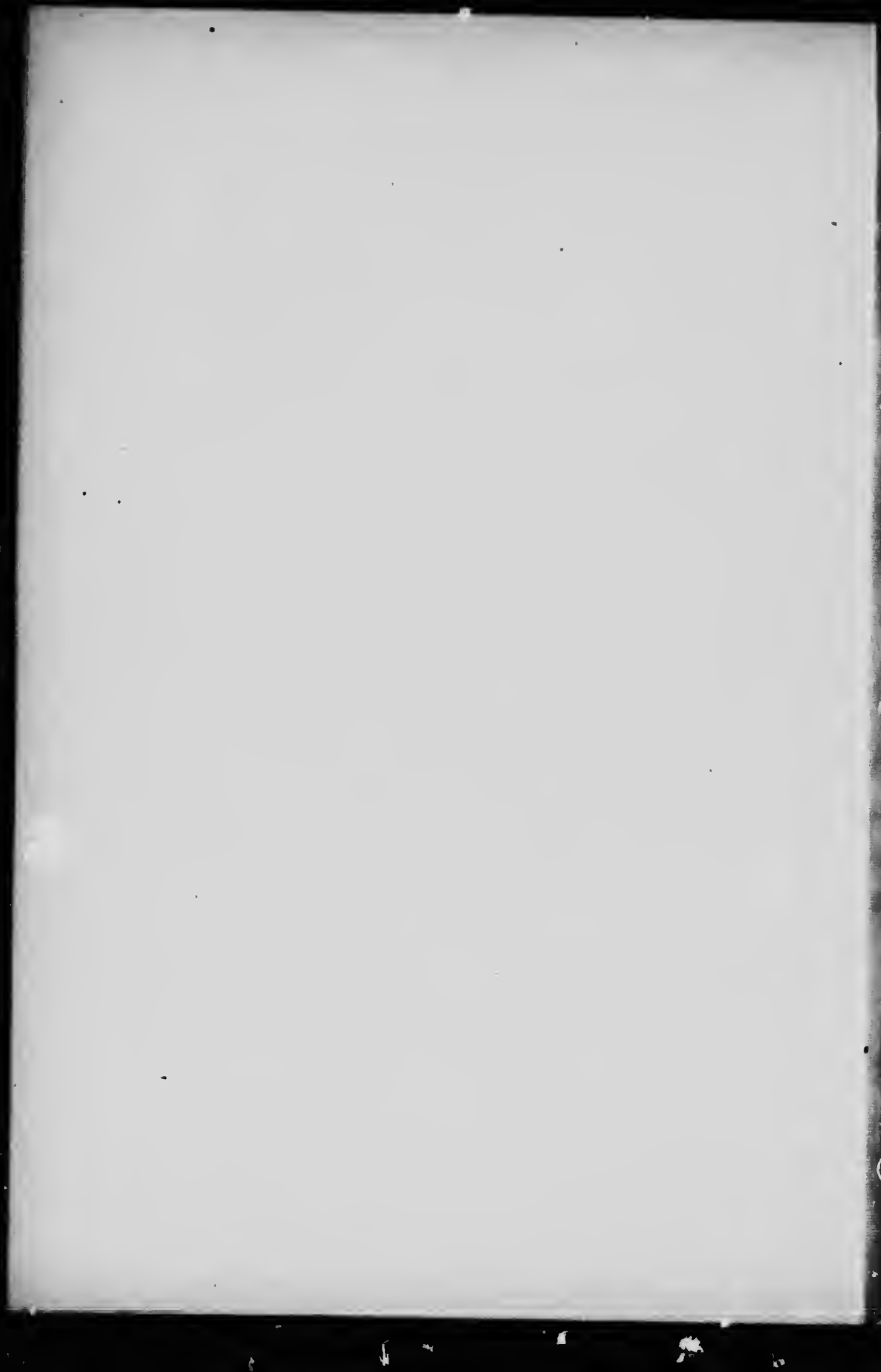
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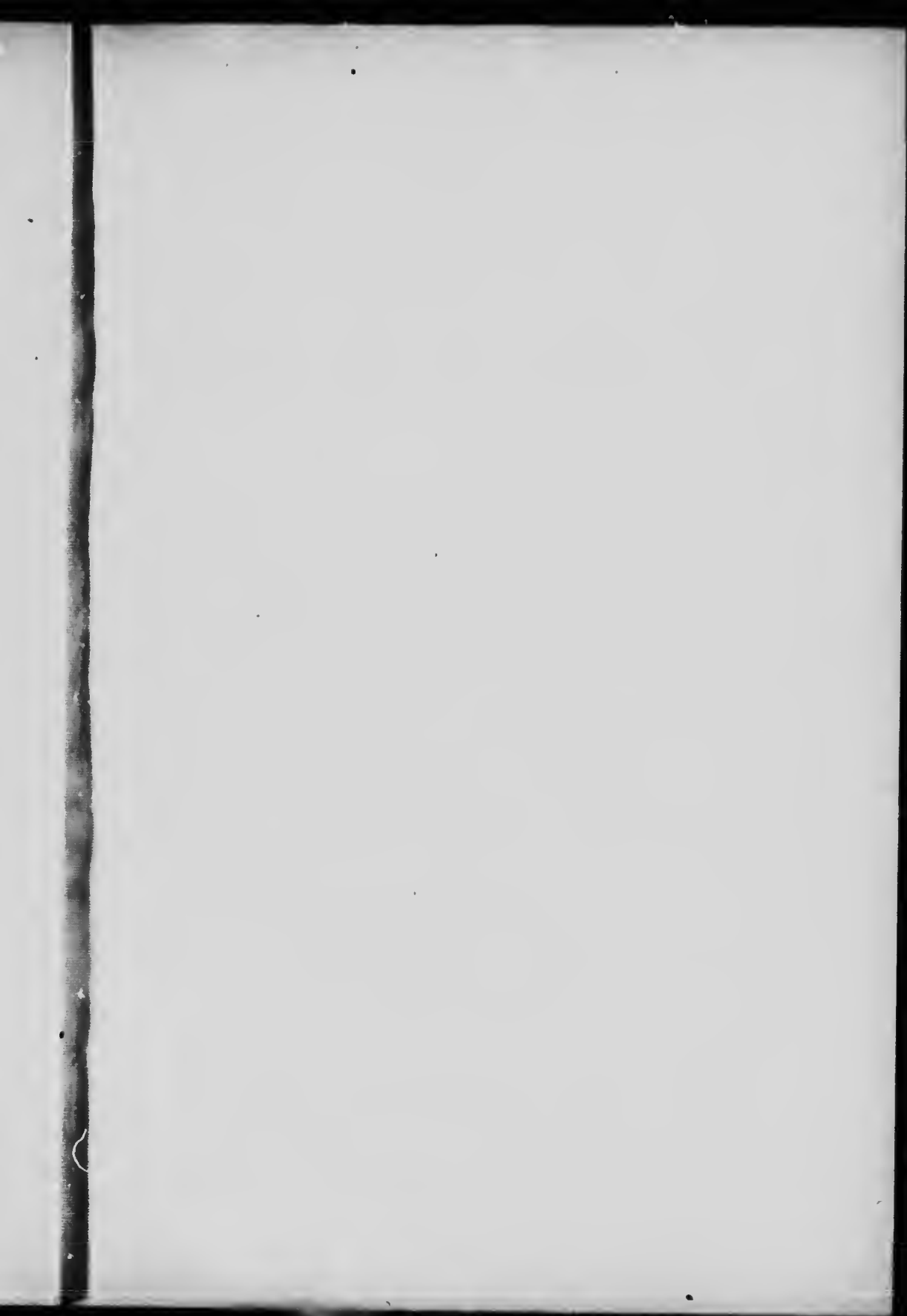


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SESSIONAL PAPER No. 19a

A. 1908

DEPARTMENT OF PUBLIC WORKS OF CANADA

Honourable WILLIAM PUGSLEY, Minister

GEORGIAN BAY SHIP CANAL SURVEY

REPORT

ON THE

PRECISE LEVELLING

YEARS 1904 TO 1907

PRINTED BY ORDER OF PARLIAMENT



OTTAWA

PRINTED BY S. E. DAWSON, PRINTER TO THE KING'S MOST
EXCELLENT MAJESTY

1908

[No. 19a—1908.]

DEPARTMENT OF PUBLIC WORKS OF CANADA

HONOURABLE WILLIAM PUGSLEY, MINISTER.

A. GOBEIL, I.S.O., DEPUTY MINISTER.

GEORGIAN BAY SHIP CANAL SURVEY

PRECISE LEVELLING

FROM ROUSES' POINT, IN THE STATE OF NEW YORK, TO GEORGIAN BAY, ON LAKE HURON
VIA MONTREAL, VAUDREUIL, OTTAWA, PEMBROKE, MATTAWA, NORTH BAY AND
THE FRENCH RIVER, AND FROM TORONTO TO NORTH BAY, VIA GRAND
TRUNK RAILWAY, INCLUDING VARIOUS BRANCH LINES.

YEARS 1904 TO 1907

CHAS. F. X. CHALONER, *in charge of party*

ASSISTED BY

EUG. GINGRAS, H. J. DUNNE AND J. L. KINGSTON

UNDER THE DIRECTION OF

EUGENE D. LAFLEUR, *Chief Engineer.*

ARTHUR ST. LAURENT, *Ass't Chief Engineer and Engineer-in-Charge.*

C. R. COUTLEE, S. J. CHAPLEAU, *District Engineers.*

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DEPARTMENT OF PUBLIC WORKS OF CANADA,

GEORGIAN BAY SHIP CANAL,

CHIEF ENGINEER'S OFFICE,

OTTAWA, January 15, 1908.

Honourable WILLIAM PUGSLEY,

Minister,

Department Public Works.

SIR,—We have the honour to transmit herewith our final report on the precise levelling carried out in connection with the Georgian Bay Ship Canal survey during the years 1904, 1905 and 1906.

The field party was under the charge of Mr. Charles F. X. Chaloner, who was assisted by Messrs. Eugene Gingras, H. J. Dunne and J. L. Kingston.

We take this opportunity of commending the admirable work done by Mr. Chaloner and his party. Neither time nor energy was spared to make a success of the work, which was performed with the greatest good will and ability, under most adverse climatic conditions, and during unfavourable seasons of the year when precise levelling has generally to be stopped on account of the degree of precision which has to be attained. That the work, even under these conditions, was extremely satisfactory will be shown in the report, and great credit is due to Mr. Chaloner and his staff.

We have the honour to be,

Sir,

Your obedient servants,

EUGENE D. LAFLEUR,

Chief Engineer.

A. St. LAURENT,

*Ass't Chief Engineer,
and Engineer-in-Charge.*

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GEORGIAN BAY SHIP CANAL SURVEY.

PRECISE LEVELLING.

INTRODUCTION.

In organizing the field force for the survey of the Georgian Bay Ship Canal route, the formation of a field party for the determination of a common plane of reference for the different sections of the survey, to which all elevations could be referred, was naturally of primary importance.

As the work on the various sections of the survey, extending from Montreal to the Georgian Bay, a distance of 440 miles, commenced at the same time, it was impossible to initiate the levelling on the different sections from a common datum, and each party had to assume a convenient and arbitrary plane of reference for preliminary levelling until such time as it would be possible to connect their net of elevations to a common line of precise levelling.

In geodetic work the plane of reference adopted is mean sea level, and all elevations are referred to that plane which is obviously of great advantage, for all reductions, comparisons, &c.

Unfortunately, in this country geodetic work is yet in its infancy, and when this survey was commenced there was no system of permanent bench marks, having received their final determination above mean sea level, which could be conveniently tapped from the different sections to be surveyed, except perhaps the levelling done in connection with the Soulanges canal by the Department of Railways and Canals.

In 1883, under the direction of Mr. R. Steckel, C.E., for the Department of Public Works of Canada, a geodetic levelling party was formed, and operated mainly along the Richelieu and St. Lawrence rivers, establishing permanent bench marks and working gradually towards the Atlantic, where a series of tidal observations have been carried on by the Department of Marine and Fisheries, from which records it will be possible, ultimately, to establish a mean tide level in connection with this geodetic levelling. Unfortunately, this work was often interrupted on account of lack of funds and for other reasons, and no final determination has yet been made. It is expected, however, that final results will be available in a year or two, and it is highly important that the work already commenced be gradually extended, and that precise levelling be systematically carried on as a permanent branch of the service.

Very valuable and interesting information in connection with this work can be found in Mr. Steckel's able reports to the Minister of Public Works for the years 1885, 1891, 1898, and 1906.

On the other hand, systematic precise levelling and tidal observations have been carried on in the United States by the Coast and Geodetic Survey, by the Geological Survey, and by the Corps of Engineers for a great many years, and an extensive net of permanent bench marks, with known elevations above mean sea level, as a common datum for all chart work has been established and is being gradually extended.

For a work of such magnitude as that of the canal survey, it was at once recognized as a necessity that a precise levelling party be formed to check finally the transfers already made of the U. S. Coast and Geodetic determinations to our territory, and carry on the same system all along the route of the proposed waterway.

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This naturally necessitated a relatively large expenditure, but the character and nature of the work demanded it. Moreover the usefulness of the work as carried out is not limited only to the canal investigation. Permanent bench marks have been established which can be used for other works as initial points for level lines, and the whole levelling has been done with a view of being utilized later in a systematic determination of a common plane for all Canadian harbours on the Great Lakes, which work it is respectfully suggested should be undertaken at once.

PRECISE LEVEL PARTY AND PROGRAMME FOLLOWED.

The precise level party was placed under the charge of Mr. Chas. F. X. Chaloner, who has been doing geodetic levelling for the Department for many years, under the direction of Mr. Steckel, and certainly no better man could have been secured to undertake this work, which required extreme accuracy and great experience.

The programme carried out was the immediate transfer of the elevation of the Coteau Landing bench mark as determined for the Soulanges canal to section No. 1 of the survey; check lines from the U. S. Coast and Geodetic bench mark at Rouses' Point, N. Y., to Coteau Landing and Cornwall; main line from Montreal to North Bay, thence to the mouth of the French river along the proposed waterway, and check line from Toronto to North Bay, with branch lines at different places as given further in detail, in all 945 miles of levelling.

In conjunction with this, automatic gauges were placed at Toronto, Collingwood and French River Harbour, to collect the necessary data for checking rise level lines by water level transfers from United States permanent gauge stations.

The determinations by water level transfer were placed under the direct supervision of Mr. District Engineer, S. J. Chapleau, and a digest of the results is given at the end of this report.

SOURLANGES CANAL DETERMINATION AND COMPARISONS.

In regard to the determination of the elevation of the Coteau Landing bench mark by the Soulanges canal staff, during construction, and the final establishment of the elevation of the initial bench mark at Rouses' Point, N. Y., with comparison of results between different operators, the following interesting information was compiled by Mr. District Engineer S. J. Chapleau, and submitted in a report dated June 12, 1905:—

'I beg to call your attention to the following data and recommendations in connection with the final establishment of the elevation of the initial bench mark at Coteau Landing, Que., to which the levels of the canal system, now under investigation, are at present being referred, as upon this bench depends the final reduction of all such levels to that one datum common to all the charts of the Great Lakes, and which result it is most desirable to obtain.

The bench mark above referred to is:—An iron bolt in the southwest corner of the south abutment of the Canada Atlantic Railway bridge over the main road between Coteau Landing and Coteau du Lac, Que., south side of the Soulanges canal.

This Coteau Landing bench mark was connected with the bench mark on the guard lock, Valleyfield, Que., by duplicate lines of levels run via the Canada Atlantic Railway bridge over the St. Lawrence river between Coteau and Valleyfield, and results checked several times by water level transfer and found to be absolutely correct; and the bench mark on the guard lock, Valleyfield, connected by duplicate lines of levels with the international bench mark at Rouses' Point, N. Y., via the Canada Atlantic and Grand Trunk Railways.

The above was carried out under the direction of the late Thomas Munro, M.I.C.E., Mem. Can. Soc. C. E., by Messrs. Allison and Pinhey, Mem. Can. Soc. C. E., during the summer and fall of 1890, during the collection of data bearing on the determination of the Soulanges canal construction datum.

During 1898 the U. S. D. W. Engineers, under the direction of the late Frank A. Davis, ran a duplicate line of levels between the international bench mark at Rouses' Point, N. Y.,

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and the bench mark on the guard lock at Valleyfield, Que. Elevations and description of the above terminal benches, and comparative results of these two duplicate lines, are given below:

Rouses' Point.—The United States Coast and Geodetic bench mark is the top of the plinth course, north end of the Chapman building, at Rouses' Point, N. Y., marked thus ⊕. Elevation 110.06.

Valleyfield.—Coping of north wall of lock 14 (guard lock) at Valleyfield, Que., Beauharnois canal, behind heel of post of upper gate.

Canadian determination.....	156.67
United States determination.....	156.791

Difference..... .121

In the opinion of A. J. Grant, C.E., Mem. Can. Soc. C. E., of the Department of Railways and Canals, who has been officially connected with the St. Lawrence canal system of levels, and is intimately informed regarding them: 'It is fair to assume that if Davis had continued his line of levels to Coteau Landing, the difference between the two lines, Rouses' Point to Coteau Landing, would be only .12 feet in a distance of 52 miles.'

The above limit of error 0.016 ✓ distance in miles between bench marks or that attained by precise methods.

From the above the elevation of the Coteau Landing bench mark would be as follows on the assumption, as before stated, that the difference in height between the Valleyfield bench mark and the Coteau Landing bench mark, is absolutely correct:

Canadian determination.....	163.32
United States determination.....	163.44

All the above elevations have been based upon the 'Grist-Mill' bench mark at Green bush, N. Y., at elevation +11.73.

This elevation—correctly 11.728—above mean tide at Governor's Island, N. Y., was determined in 1877 by Mr. O. H. Tittman, United States Coast and Geodetic Survey, and prior to 1903 was used in the determination of the levels of the northern and north-western lakes. (Appendix 8, United States Coast and Geodetic Survey, Report for 1898-9.)

The new determination of the elevation of this bench in 1903 by the Coast and Geodetic Survey of the United States as a permanent standard, and upon which all the elevations of the northern and north-western lakes are now based, has necessarily changed all permanent bench marks depending upon it, that at Rouses' Point being one of them.

This new elevation of the Greenbush 'Grist-Mill' bench has been determined at 13.863.

The Greenbush-Rouses' Point line was run under the direction of Mr. Molitor during 1902; the Rouses' Point-Valleyfield accepted as determined by the late Mr. Davis.

Rouses' Point, 1882. Is at Rouses' Point, Clinton county, N. Y., on the water table on the north side of the Chapman building, 20.6' west from the N. E. corner. — is 1.6' above ground, elevation 32.9031 metres or 107.955 feet.

Bench Mark Valleyfield. Coping of north wall of lock No. 14 Beauharnois canal. Bench mark is on the iron bolt in strap, 6" from heel post of upper gate. Elevation 47.143 metres or 154.676 feet.

For the above description, and that of the Greenbush 'Grist-Mill' bench mark, see United States Coast and Geodetic Report for 1903, pages 550, 717 and 551.

Summarized from the above and carrying the 1903 determination through to the Coteau Landing bench mark, we have the following:—

Above mean tide, Governor's Island, N.Y.

	American.		Canadian.	
	Old.	New.	Old.	New.
Greenbush.....	14.73	13.863	14.73	13.863
Rouses' Point.....	110.06	107.955	110.06	107.955
Valleyfield.....	156.79	154.676	156.67	154.56
Coteau Landing.....	156.44	161.32	163.32	161.21

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Mr. Chaloner, in his determination of the Coteau Landing bench mark, used the completed lines of precise levels of Public Works Department, connecting Rouses' Point, N. Y., to Sorel, Montreal and Lachine, Que., and ran a line of precise levels connecting Lachine with Coteau Landing, thus closing the loop.

Mr. Chaloner informs me that the elevation of his initial bench mark at Rouses' Point, which is the same bench mark as that referred to above, and known as Rouses' Point '112,' was taken at 107.80 or 0.15 feet lower than the elevation given above.

Raising Mr. Chaloner's elevation of the Coteau Landing bench mark by this amount, we have for its elevation through Sorel, Montreal, Lachine, &c., $161.07 + 0.15 = 161.22$, or a difference of only 0.01 feet from the Canadian, and 0.10 feet from the American determination from the same initial bench mark, a most remarkable result considering the distance; or an error of less than $0.007 \sqrt{\text{distance in miles}}$.

This part of the above circuit, Lachine-Coteau Landing, run by Mr. Chaloner, checks relatively very closely with lines run under the direction of the late Mr. Munro for the Department of Railways and Canals.

	Rys. and Canals.	P. W. D.
B. M. Rouses' Point, N.Y.....	110.06	107.80
B. M. Coteau Landing, Que.....	163.32	161.07
B. M. Lachine, Que.....	96.21	93.94
or correcting to the U.S.C. & G. elevation.....		107.95 Rouses' Pt.
B. M. Rouses' Point, N.Y.....	107.95	107.95
B. M. Coteau Landing, Que.....	161.21	161.22
B. M. Lachine, Que.....	94.10	94.09

The Lachine bench mark referred to is: 'Horizontal line on copper plug driven into second lower course of stone, on upper or west face of first pier, north end of C. P. Railway bridge across the St. Lawrence river. Bench mark is marked: C

B ⊖ M

Considering the above, I would recommend that the final elevation of 161.21 be given the Coteau Landing bench mark, and that all the canal levels be reduced to correspond with that elevation.

I would also recommend that a line of precise levels, under the direction of the Department be made to connect the Coteau Landing bench mark and the United States Lake Survey bench marks A and B at Cornwall, Ont., and the U. S. D. W. bench marks A, B, and 4 at St. Regis, Que., for the double purpose of verifying the above, and connecting the lower St. Lawrence level system; the latter allowing of a double check to the present G. B. S. C. levels through Kingston, Toronto, Collingwood and the French river."

CANAL LEVELS.

It is important to note, at once, before giving a description of the lines run with their results, that all the elevations recorded on the survey plans are based on the Coteau Landing bench mark elevation of 161.21 as described above, and on that of the Lachine bench mark of 94.10, all the levels having been reduced to correspond to this elevation.

At the beginning of the survey these determinations seemed to offer all the degree of accuracy required for the purpose of the canal investigation, and they were adopted for convenience and expediency.

The two check lines, however, made subsequently by Mr. Chaloner from Rouses' Point, N. Y., passing by either of these bench marks through different routes gave the following determinations:—

	Lachine B. M.	Coteau B. M.
Via Valleyfield.....	93.85	169.99
Via St. Johns, Montreal, &c.....	93.85	169.98

or a difference of minus 0.25 for the Lachine bench mark.

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This difference, however, is reduced to 0.19 at the Vaudreuil bench mark on west abutment of G. T. Railway bridge over the Ottawa river, which was used as an initial point for the Vaudreuil-North Bay line.

Therefore this variation will exist between the bench mark elevations used for the survey and those as published in this report excepting when otherwise stated.

PRECISE LEVELLING.

DISTANCES IN MILES COVERED AND ROUTES FOLLOWED.

The levelling performed may be divided into four main lines as follows:—

Line No.	Description of Routes	DISTANCE.		
		Main Lines.	Branch Lines.	Total Distance.
1	Rouses' Point to Via St. John's Landing	126.02	20.77	146.79
2	Vaudreuil to North Via Rigby broke	316.23	22.40	338.63
3	Toronto to North Via Newmarket enhurst	391.17	9.13	400.30
4	Rouses' Point to Via Lachine and Lachine	81.85	8.64	90.49
	Totals.	821.27	60.91	882.18

This levelling was done in different sections: Line No. 1 comprising sections 16, 15, 1 and 14; line No. 2 comprising sections 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13; line No. 3 embracing sections 17, 18, 19, 20, 21, 22, 23, 24, 25 and line No. 4, sections 27, 26, 28.

A description of these different sections, in their order as made, with description of routes followed connecting them, is given as follows by Mr. Chas. F. X. Chalmers, the engineer in charge of the survey.

Section Lachine to Coleau Landing

The levelling was started at B ⊕ M (Chisel line on end of copper plug, CCCCXII)

driven horizontally into second course above ground, S.W. face of 1st pier, Lachine end of C.P.R. bridge over St. Lawrence river).

The Lachine road was followed up to the G.T.R. bridge at Ste. Anne de Bellevue; here the Ottawa river was crossed in two different ways: the first, using the locks and west shore of Ottawa river; the second, using the G.T.R. bridge; both crossings closing on C

B ⊕ M (Top of copper plug driven vertically into east end of north side of west abutment of G.T.R. bridge over Ottawa river at Ste. Anne de Bellevue).

From B ⊕ M, the G.T.R. was followed to Vaudreuil; from here the post road, CCCCXII

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along the west shore of the Ottawa river was made use of, as far as the Cascades; then the road along the north side of the Soulanges canal was followed up to Coteau Landing, closing this section on Bench mark 547 (iron bolt driven horizontally into west end of north face of base of south wall of G.T.R. overhead crossing of road to Coteau du Lac, south side of Soulanges canal).

Section No. 2.—Vaudrenil to St. Eugene.

This section was started from $\overset{C}{B \ominus M}$ (Chisel line on end of copper plug, driven horizontally into west face of top course, south side of west abutment of G.T.R. bridge over Ottawa river).

From Vaudrenil, the C.P.R. was followed up to Rigaud; here a branch line was run along the C.P.R. to Pointe Fortune, closing on $\overset{C}{B \ominus M}$ (Chisel line on copper plug, driven horizontally into base, centre of east face of Pointe Fortune post office and general store, owned by Wm. Brown).

From Rigaud the C.P.R. was followed up to 2.84 miles west of St. Eugene station, closing this section on $\overset{C}{B \ominus M}$ (Chisel line on end of copper plug, driven horizontally into sixth course from top, south end of west face of large culvert 2.84 miles west of St. Eugene station).

Section No. 3.—The Brook to St. Eugene.

This section was started from $\overset{C}{B \ominus M}$ (Chisel line on end of copper plug, driven horizontally into first course above ground, under first window from front, north side of the R.C. church at The Brook).

From The Brook the C.P.R. was followed down to Vankleek Hill, where the C.P.R. crosses the G.T.R. branch line to Hawkesbury; here the G.T.R. was used to reach Hawkesbury, closing on $\overset{C}{B \ominus M}$ (Chisel line on end of copper plug, driven horizontally into first course above ground, about centre of west side of R.C. church at Hawkesbury).

From Vankleek Hill the C.P.R. was again used down to 2.84 miles west of St. Eugene station, closing this section on $\overset{C}{B \ominus M}$, already described.

Section No. 4.—The Brook to Ottawa.

This section was started from $\overset{C}{B \ominus M}$, already described, and run along the C.P.R. up to the Central station, Ottawa; here a branch line was run to the foot of the locks, closing on $\overset{C}{B \ominus M}$ (Chisel line on end of copper plug driven horizontally into twelfth course from top, northwest outside curved wall, lock 1, foot of Rideau canal).

From the Central station the levelling was crossed over to the west side of the canal and up Albert street to the City Hall, ending this section on $\overset{C}{B \ominus M}$ (Chisel line on

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end of copper plug, driven horizontally into first course above ground, under second window from front, south side of city hall building, Ottawa).

Section No. 5.—Carp to Ottawa.

C

This section is started from $B \ominus M$ (Chisel line on end of copper plug, driven horizontally into third course from top, north side of east wall of G.T.R. bridge over Carp river, .82 mile west of Carp station).

From Carp the G.T.R. was followed down to near Britannia, the overhead crossing of the C.P.R., at $B \ominus M$ (top of copper plug, driven vertically into coping, south end of west abutment of G.T.R. overhead crossing of C.P.R., seven miles west of Union station, Ottawa).

C

$B \ominus M$ (Chisel line on end of copper plug, driven horizontally into third course above pavement, south side of private entrance to Union station, Broad street, Ottawa).

From the Union station the levelling was run along Broad, Ottawa, Sherwood and Lloyd streets and G.T.R. track to Ottawa water works building, at $B \ominus M$ (Chisel line on end of copper plug, driven horizontally into second course above platform, west side of first entrance from east end of north face of Ottawa water works pump house).

From the Ottawa water works building a loop line was run, via Duke and Ottawa streets; the Union bridge; Bridge, Mann, Albert Victoria, Laurier and Yonville streets, Hull; the Alexandra bridge; down the east side of the Rideau canal to lock 1, closing this loop line on

C

$B \ominus M$ (Chisel line on end of copper plug, driven horizontally into top course, shore end of east face of lock No. 1, entrance to Rideau canal).

From the Ottawa water works building, the levelling was run along Queen, Wellington, Bank and Albert streets to city hall building, closing this section on $B \ominus M$, already described.

Section No. 6.—Carp to Sand Point.

C

This section was started from $B \ominus M$, already described, and run along the G.T.R. up to Arnprior station; then over to C.P.R. station, to $B \ominus M$ (Chisel line on end of copper plug, driven horizontally into first course above pavement, centre of west face of C.P.R. station at Arnprior).

From the C.P.R. station, the C.P.R. was followed up to .36 mile east of Sand Point station, closing this section on bench mark 582 (+ ent into coping, south wall of west end of C.P.R. culvert, .36 mile east of Sand Point station).

Section No. 7.—Haley's to Sand Point.

C

This section was started from $B \ominus M$ (Chisel line on end of copper plug

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driven horizontally into second course from top, north end of east face of C.P.R. culvert, 1.22 miles west of Haley station).

From Haley's the C.P.R. was followed down to .36 mile east of Sand Point station, closing this section on bench mark 582, already described.

Section No. 8.—Haley's to Pembroke.

This section was started from $\overset{C}{B \ominus M}$, above described, and run along the CCCCIXXX C.P.R. up to Pembroke station, closing on $\overset{C}{B \ominus M}$ (Chisel line on end of copper plug, driven horizontally into first course above pavement, under window, north end of C.P.R. station at Pembroke). CCCCXCVI

Section No. 9.—Chalk River to Pembroke.

This section was started from $\overset{C}{B \ominus M}$ (Chisel line on end of copper plug, driven horizontally into southeast end, inner side, near outer rail from round house, main track of turn table of Chalk River C.P.R. yard). CCCCXCVII

From Chalk river, the C.P.R. was followed down to 520 feet west of Petawawa station, bench mark 591 ("+" cut into coping, centre of east end of concrete culvert, 520 feet west of Petawawa station.)

From bench mark 591, a branch line was run down to the Ottawa river, closing this line on $\overset{C}{B \ominus M}$ (Chisel line on end of copper plug, driven horizontally into south face of rocky point, some 1,400 feet northwest of Petawawa wharf and about 20 feet from low water mark). DIV

From bench mark 591, the C.P.R. was again followed down to Pembroke station, closing this section on $\overset{C}{B \ominus M}$, already described. CCCCXCVI

Section No. 10.—Chalk River to Mackey's.

This section was started from $\overset{C}{B \ominus M}$, already described, and the C.P.R. was followed up to .78 mile west of Mackey station, closing on $\overset{C}{B \ominus M}$ (Chisel line on end of copper plug, driven horizontally into solid rock, close to west rail, 300 feet east of mile 25 from Chalk River and .78 mile west of Mackey's station). DIX

Section No. 11.—Deux Rivieres to Mackey's.

This section was started from $\overset{C}{B \ominus M}$ (Chisel line on end of copper plug, driven horizontally into large boulder, 10 feet north of track, 38 feet east of mile post 51, from Chalk River, and .49 mile west of Deux Rivieres station). DX

From this bench mark a branch line was run 1.90 miles down the Ontario shore of the Ottawa river, foot of Deux Rivieres rapids, closing this branch line on $\overset{C}{B \ominus M}$ (Chisel DXXIV

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line on end of copper plug, driven horizontally into solid rock, foot of high cliff, Ontario shore of Ottawa river, some 500 feet below remains of Ranson's old residence, foot of Deux Rivières rapids.)

From Deux Rivières the C. P. R. was followed down to .82 mile west of Bissett's station,

at B ⊕ M (Chisel line on end of copper plug, driven horizontally into solid rock, 15 feet north of track, 36 feet west of mile post 39, from Chalk River, and .82 mile west of Bissett's station.)

From B ⊕ M, a branch line was run along the C. P. R. to main road crossing, .50 mile west of Bissett's station: this main road was followed .75 mile, then a cross road was

used down Ontario shore of Ottawa river, closing this branch line on B ⊕ M (Top of copper plug, driven vertically into solid rock, at water's edge, ferry landing, Ontario shore of Ottawa river, foot of steep hill, leading up to Bissett's station.)

From B ⊕ M, the main line was again followed down to .78 mile west of Mackey's station, closing this section on B ⊕ M, already described.

Section No. 12.—*Deux Rivières to Eau Claire.*

This section was started from B ⊕ M, already described, and run along the C. P. R. up to mile post 71 from Chalk River, at B ⊕ M (Chisel line on end of copper plug driven horizontally into east face of immense boulder, east side of C. P. R. track, touching mile post 71, from Chalk River, and 1.20 miles east of Mattawa station).

From B ⊕ M, a branch line was run down to Ontario shore of Ottawa river, closing this branch line on B ⊕ M (Chisel line on end of copper plug, driven horizontally into southwest face of large boulder, 50 feet from water's edge, Ontario shore of Ottawa river, opposite mile post 71 of C. P. R.)

From B ⊕ M, the C. P. R. was again followed up to .16 mile east of Eau Claire station, closing on B ⊕ M (Chisel line on end of copper plug, driven horizontally into solid rock, 3 feet west of siding, 1,280 feet south of mile post 84 from Chalk river, and .16 mile east of Eau Claire station).

Section No. 13.—*North Bay to Eau Claire.*

This section was started from B ⊕ M (Chisel line on end of copper plug, driven horizontally into second course from top, west end of north face of south abutment of C. P. R. bridge over Chippewa creek, .66 mile east of North Bay station).

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C

From B $\oplus$ M, the C. P. R. was followed down to .16 mile east of Eau Claire station, closing on B $\oplus$ M, already described.

DXLIV C
DXLIII

Section No. 14.—Cornwall to Coteau Landing.

C

This section was started from United States Lake Survey B.M.A. "B $\oplus$ M" (Brass A bolt driven vertically into coping, .63 foot south of front face wall, 1.9 feet from rear edge of new entrance lock to Cornwall canal).

A C

From B $\oplus$ M, the south side of the Cornwall canal was followed up to the New York & Ottawa Railway bridge, at B $\oplus$ M (Chisel line on end of copper plug, driven horizontally into third course above ground, north face of first pier south of Cornwall canal, of New York & Ottawa Railway bridge over St. Lawrence river).

DLXI

C

From B $\oplus$ M, the fields were crossed to reach the New York & Ottawa Railway embankment, and the track was followed up to the G.T.R. junction, at B $\oplus$ M (Chisel line on end of copper plug, driven horizontally into base course, west end of north face of G.T.R. culvert, 350 feet east of New York & Ottawa Railway junction).

DLXXX

C

From B $\oplus$ M, the G.T.R. was followed down to Cornwall station, at B $\oplus$ M (Chisel line driven horizontally into base course, between first and second window from east end of rear or south face of Cornwall station).

DLXXX

C

From B $\oplus$ M, a branch line was run down Marlborough street to the foot of the Cornwall canal, closing on B $\oplus$ M, already described.

DLXII C

C

From B $\oplus$ M, the G.T.R. was again followed down to Bridge street crossing, .32 mile east of Coteau station.

DLXII

C

From Bridge street crossing, a branch line was run to Delisle river, closing this branch line on B $\oplus$ M (Chisel line on end of copper plug, driven horizontally into second course from top, west face of south abutment of highway bridge over Delisle river, at Bridge street east end of Coteau Junction village).

DLXXIX

From Bridge street crossing, the levelling was run south, along roadway, down to G.T.R. line to Valleyfield; here the G.T.R. to north side of the Soulanges canal, at B $\oplus$ M (Chisel line on end of copper plug, driven horizontally into base, east face of north abutment of G.T.R. overhead crossing of road along north side of Soulanges canal, at Coteau Landing).

CCCCXXVIII

C

From B $\oplus$ M, the levelling was crossed over to the south side of the Soulanges canal, closing on bench mark 547, already described.

CCCCXXVII

Section No. 15.—*Lachine to St. Johns.*

C

This section was started from B ⊕ M, on C.P.R. bridge at Lachine, already described.

C

From B ⊕ M, the C.P.R. was followed to the south side of the Lachine canal; CCCXCHH here the C.P.R. embankment was used to get down to the road on the south side of the canal, at B ⊕ M (Chisel line on end of copper plug, driven horizontally into second course above ground, west face of pier, south end of swing bridge over canal).

C

From B ⊕ M, the south side of the Lachine canal was followed down to the G.T.R. bridge over the canal, near St. Henri station, at B ⊕ M (Chisel line on end of copper plug, driven horizontally into second course from top, west end of north face of south abutment of G.T.R. bridge over Lachine canal at St. Henri).

C

From B ⊕ M, a branch line was run along the south side of the canal, as far down as the Wellington or Curran bridge, at B ⊕ M (Chisel line on end of copper plug, driven horizontally into base, south face, west end of guard wall, south abutment of Curran bridge over canal at Wellington street, Montreal).

C

From B ⊕ M, the canal was crossed and the levelling run along Wellington, Brennan, and Commissioner streets to the Examining Warehouse, closing this branch line on B ⊕ M (Chisel line on end of copper plug, driven horizontally into first stone above plinth, 70 feet from south end, front of the Examining Warehouse, on Commissioner street).

C

From B ⊕ M, the G.T.R. was followed to the Victoria bridge, at B ⊕ M (Chisel line on end of copper plug, driven horizontally into south face of north iron railing, opposite first steel arch, Point St. Charles end of Victoria bridge).

C

From B ⊕ M, a branch line was run along the bank of Point St. Charles yard, down to the windmill basin, over the basin opposite the G.T.R. elevator, then across to Commissioner street, at McGill street corner; then along Commissioner street down to opposite Jacques Cartier square, then along the bank to the Longueuil ferry, closing this branch line on B ⊕ M (Chisel line on end of copper plug, driven horizontally into third course above ground, 1½ feet from Forsyth street, east face of south abutment of C.P.R. overhead crossing of Forsyth street at Longueuil ferry landing).

C

From B ⊕ M, the G.T.R. was followed across the St. Lawrence river on the Victoria bridge, then along the G.T.R. to the crossing of the C.P.R. at St. Johns, at B ⊕ M

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(Chisel line on end of copper plug, driven horizontally into fourth course from top, centre of north face, east end of south abutment of G.T.R. culvert, 423 feet north of mile post 26 from Montreal, and 95 feet north of G.T.R. crossing of C.P.R. at St. Johns).

C

From B ⊕ M, a branch line was run along the C.P.R. to the Chambly canal, closing this branch on B ⊕ M (Chisel line on end of copper plug, driven horizontally into fourth course from top, lower end of curved wall, west side of lock 1, entrance to Chambly canal, at St. Johns).

C

From B ⊕ M, the G.T.R. was again followed, closing this section at St. Johns station on " + " bench mark 633 (" + " cut into granolithic pavement, 1.4 feet from north edge, 1.6 feet from west edge, northwest pointed end of St. Johns station granolithic platform).

DXCVI

Section No. 46.—Rouses' Point to St. Johns.

This section was started from bench mark " ⊕ " (⊕ cut into stone plinth, 20.6 feet from northeast corner, north face of the Chapman building, intersection of Lake and Chapman streets, Rouses' Point, N. Y.)

From " ⊕ ", Chapman street was followed up to the Delaware & Hudson Railway; here the track was taken and followed to the boundary line between the United States of America and the Dominion of Canada, at bench mark 639 " + " (+ cut on top of boulder, 14 feet west of Delaware & Hudson Railway, 33 feet north of mile post 48 from Montreal, in boundary line between the United States and Canada).

From bench mark 639 " + ", a branch line was run along the boundary line, between the United States and Canada, as far as the Richelieu river, closing this branch line on bench well A. (This bench well consists of two distinct cylinders of cast iron, $\frac{1}{2}$ inch to $\frac{3}{4}$ inch thick, and respectively 9 feet long by 9 inches in diameter, and $7\frac{1}{2}$ feet long by $12\frac{1}{2}$ inches in diameter inside; of these one is placed concentrically over the other; the flange ring $\frac{1}{2}$ inches wide at the foot of the outer tube, resting on a similar flange $3\frac{1}{2}$ inches wide cast on the inner cylinder, 3 feet above its base. The inner cylinder has a flat circular base, 2 feet in diameter and one inch thick, into which is screwed an iron tube 3 inches in diameter and 4 feet high, closed at the upper end by a cylindrical bronze or gun metal cap, with upper edge, chamfered off at an angle of $33\frac{1}{2}^\circ$ to its vertical axis; all the joints being made perfectly water tight. A hemispherical cavity of the ordinary size is turned in the top base of the cap, to be used as a seat for the ball support of the rod to be lowered into the well).

The well is closed by a heavy cast iron cover, screwed on to the outer cover.

As this bench well had been broken open by unknown persons, a larger cover weighing some 500 lbs. was placed over the inner cover.)

From bench mark 639 " + ", at the boundary line, the G.T.R. was followed down to .45 mile north of Lacolle Junction, at B ⊕ M (Chisel line on end of copper plug, driven horizontally into second course from top, northwest end face of north abutment of G.T.R. bridge over the Lacolle river, .45 mile north of Lacolle Junction).

DCIII

From B ⊕ M, a branch line was run along the railway to the second crossing; from here this cross road was taken to reach the main or post road along the Richelieu river, closing this branch line on B ⊕ M (Chisel line on end of copper plug, driven horizontally into stone foundation, one foot above ground, 2 feet from front, north wall of Louis Goudreau's brick house, west side of main river road to St. Johns and some 600 feet north of cross road 1.14 miles north of Lacolle Junction).

DCIII

IX

C

From B ⊕ M, the G. T. R. was again followed to Stottsville station, at B ⊕ M (Chisel line on end of copper plug, driven horizontally into second course from top, north face, east end of south abutment of G. T. R. culvert, 335 feet north of St. Valentin de Stottsville station).

DCIII

C

DCVI

From B ⊕ M, a branch line was run down to St. Paul de l'Isle aux Noix village, closing this branch line on bench well "B," placed inside of fence, opposite front door of St. Paul de l'Isle aux Noix hotel).

C

From B ⊕ M, the G. T. R. was again followed to Grande Ligne station, at B ⊕ M (Chisel line on end of copper plug, driven horizontally into third course above ground, 3 feet from northwest corner, north face of St. Blaise de Grande Ligne station).

C

DCVI

DCVIII

From B ⊕ M, a branch line was run down the Grande Ligne road to the main or post road, at B ⊕ M (Chisel line on end of copper plug, driven horizontally into first course above ground, 11 feet from front, west side of Marsolin Robert's large brick house, at junction of Grande Ligne and Richelieu river roads).

C

DCVIII

VI

From B ⊕ M, the post or Richelieu river road was followed for 5.84 miles, closing this branch line on B ⊕ M (Chisel line on end of copper plug, driven horizontally into first stone above ground, 6 inches from front, north wall of Francois Pinsonneault's large stone house on west side of post road, 1½ miles south of St. Johns G. T. R. station).

C

VI

IV

From B ⊕ M, the G. T. R. was again followed down to the G. T. R. water tank at B ⊕ M (Chisel line on end of copper plug, driven horizontally into north face of stone base of wooden support of G. T. R. water tank at St. Johns).

C

DCVIII

DCXII

From B ⊕ M, a branch line was run over to the military grounds, closing this branch on bench well "C," placed some 300 feet east of north main entrance to yard of St. Johns military school).

C

DCXII

From B ⊕ M, another branch line was run along Champlain street down to lock 1, closing this branch line on B ⊕ M (Chisel line on end of copper plug, driven horizontally into stone foundation, northeast corner of T. Nolin's small brick cottage, opposite lock 1, entrance to Chamblay canal, at St. Johns).

C

DCXII

From B ⊕ M, this section was closed on bench mark 633 "+," on St. Johns G. T. R. station platform, already described.

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Section No. 17.—Toronto to Newmarket.

C

This section was started from B ⊕ M (Chisel line on end of copper plug, driven horizontally into first course above ground, 24 feet from south corner, east of James street face of Toronto city hall building).

C

From B ⊕ M, the levelling was run along James, Albert, University, Queen and Simcoe streets, to the Union station, at B ⊕ M (Chisel line on end of copper plug, driven horizontally into base of buttress, west face of southwest corner of south building of Union station at Toronto).

C

From B ⊕ M, the G.T.R. was followed to Bathurst street bridge, at B ⊕ M (Chisel line on end of copper plug, driven horizontally into first course above ground, east end of south face of north abutment of iron bridge over railway tracks, foot of Bathurst street).

C

From B ⊕ M, a branch line was run down to the lake shore, closing this branch on bench mark 647 ("+" cut into coping, southwest corner of large arched portal of Garrison creek sewer, some 800 feet north of west end of Queen's wharf, Toronto bay).

C

From B ⊕ M, the G.T.R. was then followed to Strachan avenue crossing; here a branch line was run up to Queen street, and into Trinity college grounds, closing this branch

C

on B ⊕ M (Chisel line on end of copper plug, driven horizontally into dressed stone base, 31.8 feet from rear end, west face of Trinity college, Toronto).

C

From Strachan avenue crossing, the G.T.R. was followed to Toronto Junction at B ⊕ M (Chisel line in end of copper plug, driven horizontally into north face of stone pier, under east column of iron trestle, supporting south end of bridge over C.P.R. tracks at Weston road, west end of C.P.R. station at Toronto Junction).

From Toronto Junction, the C.P.R. was followed to the crossing of the G.T.R. line to North Bay, at bench mark 652 ("+" cut into coping, on east end of south wall of C.P.R. culvert, 18 feet W. of G.T.R. line to North Bay).

From bench mark 652, a branch line was run along the C.P.R. to North Toronto station at B ⊕ M (Chisel line on end of copper plug, driven horizontally into base, under centre window, east wall of C.P.R. station at North Toronto).

From North Toronto, the levelling was run along the C.P.R. to Yonge street; then down Yonge street, Mariborough avenue, Avenue road and street; then through Queen's

C

Park to B ⊕ M (Chisel line on end of copper plug, driven horizontally into base, 1.6 feet south of second basement window from north end of Toronto University Biological Department building, Queen's Park).

C

From B ⊕ M, the levelling was continued down University, Albert and James streets,

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C
closing this branch line on B $\ominus$ M, on city hall building, already described.
DCXIII

From bench mark 652 "+," the G. T. R. line to North Bay, was followed up to Newmarket, closing this section on B $\ominus$ M (Chisel line on end of copper plug, driven horizontally into second course from top, south end of east face of north abutment of G. T. R. bridge over Holland river, north of Timothy street crossing, Newmarket).
DCXXXIX

Section No. 18.—Barrie to Newmarket.

C
This section was started from B $\ominus$ M (Chisel line on end of copper plug, driven horizontally into stone foundation, 1.8 feet above ground, and 5.45 feet east of west end door, south or rear wall of post office at Barrie).
DCXL

C
From B $\ominus$ M, the G. T. R. was followed down to the Holland river crossing, at Newmarket, closing this section on B $\ominus$ M, already described.
DCXXXIX

Section No. 19.—Barrie to Collingwood.

C
This section was started from B $\ominus$ M, above described; and run along Dunlop street, Elizabeth road and first concession road to G. T. R. line to Meaford; here the G. T. R. was followed to Collingwood at B $\ominus$ M (Chisel line on end of copper plug, driven horizontally into foundation under window, south side of main entrance to G. T. R. station at Collingwood).
DCLXVIII

C
From B $\ominus$ M, the levelling was run through the Collingwood ship yard, closing this section on B $\ominus$ M (Chisel line on end of copper plug, driven horizontally into first course above ground, east corner of face of Collingwood Ship Building Company's pump house).
DCLXIX

Section No. 20.—Barrie to Longford.

C
This section was started from B $\ominus$ M, already described, and run along the G. T. R. to Longford, closing this section on B $\ominus$ M (Chisel line on end of copper plug, driven horizontally into base, north end of west face of solid rock, 60 feet west of main track and opposite mile post 93-133, north side Longford station crossing).
DCLXXXVII

Section No. 21.—Orillia to Midland.

This section was started from bench mark 672 (brass-headed nail driven vertically into second altar step from top, north end of east wall of wooden culvert, 563 feet east of Orillia station).

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From bench mark 672, the G.T.R. was followed to Midland, closing this section
 C
 on B ⊕ M (Chisel line on end of copper plug, driven horizontally into stone foundation,
 DCC
 1.2 feet above pavement, under space between 4th and 5th first floor windows from front,
 Bay street wall of Queen's hotel, Midland).

Section No. 22.—Falkenburg to Longford.

This section was started from B ⊕ M (Top of copper plug, driven vertically into
 C
 bed rock, 21 feet west of track, 213 feet south of mile post 127-100 and .18 mile north of
 DCCI
 G.T.R. station at Falkenburg).

From B ⊕ M, the G.T.R. was followed to Gravenhurst at B ⊕ M (Chisel
 C
 line on end of copper plug, driven horizontally into west face of solid rock, 36.4 feet east
 DCCXI
 of main track and 360 feet north of north semaphore of G.T.R. station at Gravenhurst).

From B ⊕ M, a branch line was run down the G.T.R. to Muskoka lake, closing
 C
 this branch line on B ⊕ M (Top of copper plug, driven vertically into solid rock,
 DCCXI
 DCCXII
 225 feet west of end of Muskoka wharf, between wharf of Mickle, Dymont & Company
 and boat house).

From B ⊕ M, the G.T.R. was then followed down Longford station, closing
 C
 this section on B ⊕ M, already described.
 DCCXI
 DCLXXXVII

Section No. 23.—Falkenburg to Scotia Junction.

This section was started from B ⊕ M, already described, and run up to .08 mile
 C
 south of Scotia Junction, closing this section on B ⊕ M (Chisel line on end
 DCCI
 DCCXLVII
 of copper plug, driven horizontally into solid rock, 14 feet east of track and .08 mile south
 of Scotia Junction).

Section No. 24.—South River to Scotia Junction.

This section was started 2.08 miles north of South River station, on B ⊕ M
 C
 (Chisel line on end of copper plug, driven horizontally into solid rock, 10.8 feet east of track,
 DCCXLVIII
 and 51.4 feet south of mile post 36-191).

From C, the G.T.R. was followed down to .78 mile north of Burk's Falls station
 B ⊕ M
 DCCXLVIII
 at B ⊕ M (Chisel line on end of copper plug, driven horizontally into sixth course from
 DCCLXII
 top, west face of north abutment of G.T.R. bridge over north branch of Magnetawan river,
 .78 mile north of G.T.R. station at Burk's Falls).

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C

From B ⊖ M, a branch line was run down the G.T.R. to the Magnetawan wharf, closing this branch line on bench mark 718 ("+" cut into bed rock, 34 feet south of track, and 39.2 feet east of east end of Magnetawan wharf, Burk's Falls).

DCCLXII

C

From B ⊖ M, the G.T.R. was followed down to .08 mile south of Scotia Junction, closing this section on B ⊖ M, already described.

DCCLXII

C

DCCXLVII

Section No. 25.—South River to North Bay.

C

This section was started from B ⊖ M, already described, and run along the G.T.R. to Nipissing Junction, at B ⊖ M (Chisel line on end of copper plug, driven horizontally into solid cliff rock, 10.4 feet southwest of track, and 50 feet north of junction of G.T.R. with C.P.R. at Nipissing Junction).

C DCCXLVIII

DCCXCV

C

From B ⊖ M, the C.P.R. was then run to North Bay station, closing this section on B ⊖ M (Chisel line on end of copper plug, driven horizontally into base, centre of southeast face of C.P.R. station at North Bay).

C DCCXCV

DCCXCVI

Section No. 26.—Coteau Junction to Aubrey.

C

This section was started from B ⊖ M, already described, and run along Bridge street to the crossing of the G.T.R. branch line to Valleyfield; here the G.T.R. was used to the Soulanges canal at B ⊖ M (Chisel line in end of copper plug, driven horizontally into top course, north face of up stream end of north abutment of G.T.R. swing bridge over Soulanges canal, at Coteau Landing).

DLXXIX

C

DCCXCVII

C

From B ⊖ M, a branch line was run down to bench mark 547, already described.

DCCXCVII

C

From B ⊖ M, the G.T.R. was followed to Valleyfield station; from here a branch line was run to the Beauharnois canal, closing this branch on B ⊖ M (Chisel line on end of copper plug, driven horizontally into foundation, one foot above ground, and 29 feet from front north gable end of Larocque House, Valleyfield).

DCCXCVII

C

DCCCV

From Valleyfield station, the G.T.R. was followed to the crossing of the canal, at bench mark 730 ("+" cut on coping down stream side of south abutment of G.T.R. bridge over Beauharnois canal).

From bench mark 730, a branch line was run along the north side of the canal up to lock 14, at bench mark 729 ("+" cut on strap, 6 inches from heel post, north end of upper gates of lock 14, Beauharnois canal).

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From bench mark 730, the G.T.R. was followed to Aubrey, closing this section on
 C
 B ⊕ M (Chisel line on copper plug, driven horizontally into second course from top,
 DCCCXVIII
 west end of south face of small culvert 2,570 feet west of mile post 34, and 2.12 miles west
 of Aubrey station).

Section No. 27.—Rouses' Point to Aubrey.

This section was started from bench mark ⊕, on the Chapman building, and run up
 Chapman street to Delaware & Hudson tracks; along Delaware & Hudson Railway to
 boundary line between the United States and Canada; a branch line was run along the
 boundary line to bench well, near Richelieu river; from the boundary line the Delaware &
 Hudson Railway or G.T.R. was followed to Lacolle Junction, at bench mark 737 ("+"
 cut into second altarstep, east end of south ballast wall of small culvert, 210 feet north of
 semaphore south of G.T.R. branch line to Ottawa, Lacolle Junction).

From bench mark 737, the G.T.R. branch to Ottawa was followed up to the cross
 road to the R. C. church; here a branch line was run up to the church, clos-
 C

ing this branch line on B ⊕ M (Chisel line on end of copper plug, driven horizontally
 DCCCXXIII
 into stone foundation, one foot above ground, 61.9 feet from front and 38.3 feet from rear
 end of Ste. Claude de Lacolle R. C. church).

From cross road to Ste. Claude R. C. church, the G.T.R. was followed to
 C
 2.12 miles west of Aubrey station, closing this section on B ⊕ M, already described.
 DCCCXVIII

Section No. 28—Lachine to Cohon Junction.

C
 This section was started from B ⊕ M, on Lachine end of C.P.R. bridge, already
 CCCCXIII
 described, and run along the C.P.R. to the swing bridge over the canal, at bench mark
 743 ("+" cut on coping, south end of west side of abutment of C.P.R. swing bridge over
 Lachine canal).

From bench mark 743, a branch line was run down the C.P.R. embankment to B ⊕ M,
 already described. C

From bench mark 743, the C.P.R. was followed to the overhead crossing of the G.T.R.;
 DXXXXI
 here the levelling was run from the C.P.R. embankment to the G.T.R. at B ⊕ M (Chisel
 C

line on end of copper plug, driven horizontally into second course above ground, 9 feet from
 DCCCXXXIX
 west end of north face of south abutment of C.P.R. overhead crossing of G.T.R., .11
 mile west of G.T.R. station at Rockfield, Lachine).

C
 From B ⊕ M, the G.T.R. was followed to Mountain street crossing, at B ⊕ M
 DCCCXXXIX
 (Chisel line on end of copper plug, driven horizontally into second course above ground,
 DCCCXLVII
 6.6 feet from west end of north face of G.T.R. freight shed nearest to tracks, at Mountain
 street crossing, Bonaventure station, Montreal).

C
 From B ⊕ M, the levelling was run along Mountain, McCord and Wellington streets
 DCCCXLVII
 to the Curran bridge, closing this branch line on B ⊕ M, on south side of Curran bridge
 DC
 over Lachine canal at Wellington street, Montreal, already described.

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C

From B ⊖ M, near Rockfield station, the G.T.R. was followed up to opposite the
DCCCXXXIX C
Lachine wharf, at B ⊖ M (Chisel line on end of copper plug, driven horizontally into
DCCXI.
second course from top, under north rail, east face of ballast wall of G.T.R. culvert, 1,820
feet east of mile post 8, Lachine).

C

From B ⊖ M, a branch line was run to the Lachine wharf, closing this branch line
C DCCXXI
on B ⊖ M (Chisel line on end of copper plug, driven horizontally into first cut stone above
CCCXCVI
ground, southeast corner of double stone house, second west of 34th avenue, along Lachine
road, west of wharf, Lachine).

C

From B ⊖ M, the G.T.R. was followed to Dorval station; here a branch line was
DCCCXI. C
run down to the R. C. church, closing this branch line on B ⊖ M (Chisel line on end of
CCCXCXIII
copper plug, driven horizontally into first cut stone above ground, one foot from rear end,
west wall of Dorval R. C. church).

From Dorval, the G.T.R. was followed up to Bridge street, .32 mile east of Coteau
station; here Bridge street was followed to the highway bridge over Delisle river, closing

C

this last section on B ⊖ M (Chisel line on end of copper plug, driven horizontally into
DLXXXIX
second course from top, west face of south abutment of highway bridge over Delisle river
at east end of Coteau Junction village).

ACCURACY OF RESULTS.

The accuracy of the main line of levels from Rouses' Point to North Bay, upon which
depended all other subsidiary level lines in connection with the survey, was of supreme
importance.

This has been proven to be substantially correct, within all reasonable limits of errors
for long level lines, by a check line from Toronto to North Bay and water level transfers
from (the self) registering United States gauging stations at Tibbett's Point, N.Y., on Lake
Ontario to a similar station established at Toronto, and also by further water level transfers
from Mackinaw City and Harbour Beach Lake Huron gauging stations, to Collingwood
and French River Harbour, thence by level line through the French river to North Bay
(Chippewa bench mark).

The "Chippewa" bench mark at North Bay was therefore the objective point of three
different lines of levels, all having for base the United States Coast and Geodetic and Lake
Survey system, the different points of which have been determined in elevation above mean
sea level as close as it is possible to do it in long distance precise level work.

The approximate length of these different lines is.

Rouses' Point to North Bay.....	= 482 miles.
Toronto to North Bay.....	= 227 "
French River Harbour to North Bay.....	= 80 "

The resulting elevations are given in detail further in this report, and it will be noted
that the difference in elevation of the "Chippewa" bench mark, at North Bay, by the dif-
ferent lines, varies from 0.85 to a little over a foot, difference which it has been possible to
adjust satisfactorily by means of the many checks obtained.

Various limits of precision have been fixed in regard to the final error of a series of
observations by different precise levelling surveys.

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The United States Coast and Geodetic Survey calls for a precision in feet equivalent to 0.02 feet $\sqrt{\text{distance in miles}}$.

The United States Geological Survey has fixed the same limit, and the United States, Mississippi and Missouri River Commission that represented by the formula $0.0126 \sqrt{\text{distance in miles}}$, for direct lines.

But it has been recognized that a limit of error based on these formulae, while found satisfactory for short lines, often proves too severe for long lines, and it is generally impossible to maintain it for such a great distance as involved in the levelling under consideration.

The British Ordnance Survey limit of 0.01 feet per mile and that used by the United States Lake Survey of $0.041 \sqrt{\text{distance in miles}}$ would seem to more fairly apply to the present case and the resulting error is well within these limits.

The European International Geodetic Association consider as fair a limit of probable error of 0.0085 feet per mile, while if the error is reduced to half of this figure (0.0042 feet per mile) it is considered that a very high degree of precision has been obtained.

Taking the Rouses' Point, Valleyfield, North Bay, Toronto line, a distance of about 710 miles of actual levelling, the above high degree of precision is more than obtained: $710 \times 0.0042 = 2.98$ feet, the highest discrepancy found being very little over 1 foot.

RESULTS, COMPARISONS AND ADJUSTMENTS.

In the following pages, the results of the different lines of precise level and water level transfer are given and compared, adjustments required deduced and condensed data regarding water level transfers given.

Datum.—Mean sea level, Atlantic Ocean, New York City.

Initial Bench Mark.—B.M. $\oplus$ Chapman building, Rouses' Point, New York State. Elevation above mean sea level, 107.955.

From this initial bench mark, the levelling was run to Coteau Landing by two different routes as previously described—

Length of 1st route, 90 miles; length of 2nd route, 50 miles. These two lines were joined at bench mark 547. (Iron bolt driven horizontally into southwest corner of north face of south abutment of G.T.R. overhead crossing of road along south side of Soulanges canal).

Elevation of B.M. 547 via 1st route.....	160.98	feet.
Elevation of B.M. 547 via 2nd route.....	160.99	"
Mean.....	160.985	"
Elevation of B.M. 547 via U.S. & W. Engineers route to Valleyfield and C.D.W. Engineers to Coteau Landing.....	161.320	"
Difference.....	.335	"

The first route as a check was continued up to Cornwall and tied in on U.S.L.S.' bench mark A (brass bolt in coping .63 feet south of front face wall and 1.9 feet from rear edge of new entrance lock to Cornwall canal).

C U.S.L.S. B $\oplus$ M—Via U.S. Engineers.....	167.031	feet.
A " Georgia Bay Canal Survey.....	166.730	"
Difference.....	.301	

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If we refer all these determinations to bench mark 547 we have the following elevations:—

Via Rouses' Point to Coteau, via St. Lambert.....	160.98	feet.
" Rouses' Point to Coteau, via Valleyfield.....	160.99	"
C		
" B ⊕ M at Cornwall to Coteau, via G.T. Ry.....	161.28	"
A		
" U.S.D.W. and C.D.W. Engineers.....	161.32	"
Mean of 1st and 2nd results.....	160.985	"
Mean of 3rd and 4th results.....	161.300	"
Difference.....	315	"
Probable correct elevation of B.M. 547.....	= 161.30	"
1st route elevation of B.M. 547.....	= 160.98	"
Difference.....	.32	"

.32 feet in 90 miles = .0035 feet per mile to be added to instrumental determinations from initial point at Rouses' Point through 1st route.

The correction for the 2nd route, 50 miles long, is similarly found to be .0062 feet per mile.

VAUDREUIL TO NORTH BAY.

C

The initial bench mark for this line is B ⊕ M-CCCCXV (Chisel line on end of copper plug, driven horizontally into west face of top course, south end of west abutment of G.T.R. bridge over Ottawa river at Vaudreuil).

Elevation, via Rouses' Point, St. Lambert to Vaudreuil.....	88.24	feet
Add correction for 77 miles at .0035 feet per mile.....	+ .27	"
Corrected elevation.....	88.51	"
Elevation, via Rouses' Point, Valleyfield to Vaudreuil.....	88.30	"
Add correction for 66 miles at .0062 feet per mile.....	+ .41	"
Corrected elevation.....	88.71	"
Mean of two routes.....	88.61	"

C

This line terminates on B ⊕ M-DXLIV (Chisel line on end of copper plug, driven horizontally into second course from top, west end of north face of south abutment of C.P.R. bridge over Chippewa creek, North Bay).

Elevation, via Rouses' Point, Vaudreuil to North Bay (as per mean of St. Lambert and Valleyfield routes as corrected to Vaudreuil).....	649.99	feet.
Elevation, via water transfer from Tibbett's Point, N.Y., to Toronto and Georgian Bay Canal levelling to North Bay along G.T.R.....	650.71	"
Difference.....	.72	"

C

Probable correct elevation of B ⊕ M-DXLIV..... 650.71 "

Distance from Vaudreuil to North Bay 316 miles .72 feet in 316 miles = .00228 feet per mile to be added for adjusted elevations between B.M.-CCCCXV and B.M.-DLXIV.

The determination of this elevation for the terminal bench mark at North Bay was done through water level transfer from Tibbett's Point, across Lake Ontario to Toronto and thence by levelling to North Bay.

It was desirable that the long line run from Vaudreuil to North Bay be conclusively checked and herein below condensed data and results of this check are given.

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WATER LEVEL TRANSFERS, LAKE ONTARIO.

Simultaneous Gaugings.

TIRRETT'S POINT, N.Y.				TORONTO, ONT.			
Month	No. of days	Monthly mean elevation.	Weighted mean elevation.	Month.	No. of days	Monthly mean elevation.	Weighted mean elevation.
1906.				1906.			
July.	31	246.40	7638.40	June.	26	3.114	80.964
August.	31	246.14	7630.34	July.	31	3.281	101.711
September.	30	245.77	7373.10	August.	31	3.055	94.705
October.	29	245.66	7124.14	September.	25	2.965	74.125
November.	30	245.55	7366.50	October.	28	2.811	78.708
				November.	19	2.771	52.658
Arithmetical mean elevation. 245.904				Arithmetical mean elevation. 2.9996			
Weighted mean elevation. 245.91				Weighted mean elevation. 3.018			
				Zero of gauge — 3.018 below W.S.			
				Zero of gauge to B. M. 646½ + 11.475.			

Weighted mean elevation of Lake Ontario = 245.9105 above M.S.L. New York
 Weighted mean elevation of Lake Ontario
 to zero of automatic gauge. = 3.0180

Zero of Toronto gauge. = 242.8925
 Zero of automatic gauge up to B.M. 646½ = +11.4750

B.M. 646½. = 254.3675
 B.M. 646½ to zero of Toronto Harbour
 Commission gauge. = -9.3490

Zero of Toronto Harbour Commission
 gauge on Victoria pier. = 245.0185

Bench mark 646½ referred to is top of spike, level with coping southeast corner of
 Garrison sewer portal, about 800 feet northwest of Victoria pier, Toronto harbour.
 From Toronto the levelling was run along the G. T. R. to North Bay, joining the level-
 ling from Rouses' Point, at B ⊕ M-DXLIV.

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LAKE HURON.—WATER TRANSFERS.

Water level transfers were made from Mackinaw City and Harbour Beach automatic permanent gauges to Collingwood and French River on Georgian Bay in order to establish a check on level lines to these points.

HARBOR BEACH.			MACKINAW CITY.			COLLINGWOOD.		
Month.	No. of days.	Monthly mean elevation.	Month.	No. of days.	Monthly mean elevation.	Month.	No. of days.	Monthly mean elevation.
1906.			1906.			1906.		
						May.....	15	.963
						June.....	30	.861
July.....	31	581.45	July.....	31	581.51	July.....	31	.743
August.....	31	581.36	August.....	30	581.38	August.....	31	.869
September.....	30	581.12	September....	21	581.08	September....	30	1.033
October.....	31	580.87	October.....	27	580.85	October.....	31	1.307
November.....	30	580.68	November....	30	580.72	November.....	27	1.479
Weighted mean elevation...581.098			Weighted mean elevation... 581.118			Weighted mean readings..... 1.0340		

Weighted mean elevation of Lake Huron..... 581.108 feet.
 Weighted mean elevation to zero of Collingwood automatic gauge..... +1.034 "

Zero of Collingwood automatic gauge, via water transfer 582.112 "
 Zero of Collingwood automatic gauge to B.M. 668½..... +5.66 "

B.M. 668½..... = 587.80 "

Bench mark 668½ is top of iron spike driven vertically into top of plinth, northeast corner of Collingwood Ship Building Co's pump house, Collingwood.

The comparison of results at Collingwood are as follows:—

Elevation of B.M. 668½, via water transfer from Tibbett's Point, N.Y., to Toronto and precise level line to Collingwood..... 587.10 feet.

Elevation of B.M. 668½, via water transfer from Harbor Beach and Mackinaw City, Mich..... 587.80 "

Difference..... .40 "

The probable correct elevation of B.M. 668½ being taken at 587.80 feet and the distance from Toronto to Collingwood being 92 miles, the correction to be made is .00435 feet per mile, to be added up to Collingwood to the instrumental elevations.

SIMULTANEOUS HOURLY GAUGINGS AT COLLINGWOOD, WAUBAUSHENE AND HARBOR BEACH, JANUARY 5-17, 1906.

Mean of 108 Readings.

Collingwood.....	580.18	feet above mean sea level.
Waubushene.....	580.16	" " "
Harbor Beach.....	580.54	" " "
Difference between Collingwood and Waubushene.....	=	.02 feet.
Correction from Toronto to Collingwood as above.....	=	.40 "
Correction from Toronto to Waubushene.....	=	.42 "

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From Toronto to Waukenaishene 101 miles. .42 feet in 101 miles = .0041 feet per mile, to be added to obtain adjusted elevations.

SIMULTANEOUS HOURLY GAUGINGS AT COLLINGWOOD, MIDLAND AND HARBOR BEACH.
SEPTEMBER 5-18, 1906.

Mean of 149 Readings.

Collingwood.....	580.80	feet above mean sea level.
Midland.....	580.62	" " "
Harbor Beach.....	581.13	" " "
Difference between Collingwood and Midland.....	.18	feet.
Difference between Collingwood and Waukenaishene.....	.02	"
Difference between Waukenaishene and Midland.....	.16	"

From Waukenaishene to Midland, 13 miles. .16 feet in 13 miles = .0123 feet per mile to be added to obtain adjusted elevations.

ORILLIA TO NORTH BAY.

From Toronto to Orillia is 80 miles. 80 miles at .00435 feet per mile = .35 feet.

Elevation of B ⊕ M DXLIV at North Bay, via water transfer from Tibbet's Point, N.Y., to Toronto and precise level line as corrected up to Orillia..... 651.06 feet.

Probable correct elevation of B ⊕ M DXLIV..... 650.71 feet.

Difference..... .35 "

From Orillia to North Bay, 140 miles. .35 feet in 140 miles = .0025 feet per mile to be deducted to obtain adjusted elevations.

WATER TRANSFERS, LAKE HURON.

Determinations referring to French River on Georgian Bay.

HARBOR BEACH.			MACKINAW CITY.			FRENCH RIVER.		
Month.	No. of days.	Monthly mean elevation.	Month.	No. of days.	Monthly mean elevation.	Month.	No. of days.	Monthly mean readings.
1906.			1906.			1906.		
July.....	31	581.45	July.....	31	581.51			
August.....	31	581.36	August.....	30	581.38			
September.....	30	581.12	September.....	21	581.03	September.....	30	1.302
October.....	31	580.87	October.....	27	580.85	October.....	27	1.093
November.....	30	580.68	November.....	30	580.72	November.....	17	.631
Weighted mean elevation.....		581.098	Weighted mean elevation.....		581.118	Weighted mean readings.....		1.0606

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Zero of French River gauge = 1.0606 below water surface.

Zero of gauge to B. M. 26 on ring bolt 125 feet south of

Ontario Lumber Company's wharf at French River village + 11.770

B. M. 26 to B. M.-DXLIV, "Chippewa creek", North Bay + 59.2352

Weighted mean elevation of Lake Huron..... 581.1680 feet.

Weighted mean readings to zero of French River automatic

gauge..... 1.0606 "

Zero of French River automatic gauge, via water level transfer 580.0476 "

Zero of French River gauge via precise level from Toronto 579.7048 "

Difference..... .3428 "

The difference of .3428 is reduced to .10 if we eliminate the readings at French river for the month of November, which seem to have been erratic as compared with gaugings at Harbor Beach and Mackinaw City for the same month due probably to local weather conditions.

On this basis the following deductions are made:—

Mean elevation of Lake Huron, September and October..... 580.98 feet.

Mean elevation of Lake Huron to zero of French River gauge... 1.18 feet.

Zero of French River automatic gauge via water transfer... 579.89 "

Zero of gauge to B. M. 26, French River..... 11.77 "

Elevation of B. M. 26..... 591.57 "

B. M. 26 to B. M. DXLIV, Chippewa creek, North Bay..... 59.24 "

B. M. DXLIV via water transfer..... 650.81 "

B. M. DXLIV via precise level from Toronto and Tibbett's

Point..... 650.71 "

B. M.-DXLIV via Rouses' Point and Vaudreuil, instrumental, 649.66 "

B. M.-DXLIV via Rouses' Point and Vaudreuil, adjusted..... 650.71 "

CHECKING OF PRECISE LEVELS BY WATER LEVEL TRANSFERS.

As mentioned at the beginning of this report the placing and maintenance of automatic continuous gauges in reference to necessary water transfers for proper checks on the level lines was under the immediate direction of Mr. S. J. Chapleau, District Engineer for the Nipissing and western end of the canal survey.

Extracts of his report in this connection, with some deductions made, are given below:—

"The projected level system of the Georgian Bay Ship Canal Survey is referred to the same datum as the United States Coast and Geodetic, and the Lake Survey precise level systems for reasons that are obvious.

"The main line of levels of the Georgian Bay Ship Canal Survey start from Rouses' Point, N.Y., bench mark 1881, Chapman building, and determine by different lines the elevation of B. M.-CCCXCH at Laclune, upon which the elevations of the bench marks along the route of the proposed canal as far as North Bay depend and terminates in B. M.-DXLIV on abutment of a bridge over Chippewa creek, referred to hereafter as "Chippewa."

From the above bench mark the levels were carried by a special party attached to section No. 1 across Lake Nipissing and down the Pickering and French rivers, terminating in a bench mark at French River village on Georgian Bay. In addition to the above the terminal

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B. Ms. 646½ on the portal of the Garrison street sewer, Toronto harbour, and 668½ on the pump house of the Ship Building Company, Collingwood, were connected by precise level with the "Chippewa" bench.

'In order to establish a check on the "Chippewa" and French river bench marks, "Haskell" automatic recording gauges were established at French River village, Collingwood and Toronto, by which water level transfers were obtained with Mackinaw City and Harbor Beach, Mich., for Lake Huron, and with Tibbett's Point, N.Y., for Lake Ontario. The Rouses' Point bench and the bench marks upon which the zeros of the United States Lake Survey automatic gauges at Tibbett's Point, N.Y., Harbor Beach and Mackinaw City Mich., depend, are all embraced in the 1903 adjustment of the United States precise level net.

'The records of the United States automatic gauges were kindly supplied by Col. G. J. Lydecker, United States Corps of Engineers, in charge of the United States Lake Survey, stationed at Detroit.

The gauges were run as follows:—

Location.	From	To	Number of days.
French River.....	September 1...	November 17...	74
Collingwood.....	May 15.	" 27.	196
Toronto.....	July 1.	" 16.	139
Mackinaw City.....	July 1.	" 30.	153
Sand Beach.....	July 1.	" 30.	153
Tibbett's Point.....	July 1.	" 16.	139

'The method of reduction was as follows:—The gauge sheets show a continuous profile of water surface during the time run, from which 24 hourly readings are obtained between it and the zero line by scale, and the arithmetical mean of the day obtained. The daily means give an arithmetical monthly or period mean, which, with the number of days in each period, yield a weighted mean by method of least squares for the entire time of observation. In deriving the final means given below, the mean for each month has been assigned a weight proportional to the number of days during which observations were taken, weighted mean being: $X_0 = \frac{\sum (P_n)}{\sum P}$. The difference in elevation between the zero of gauge and adja-

cent bench mark being checked by "Y" level from time to time during season of running of gauge.

'On comparing the gauge records by days, it was found that breaks occurred during different days at each station; in compiling the results only those days having corresponding dates at the two points being compared, were considered. The prefixes + or — to the weighted means of the gauge readings indicate the position of the zero, above or below the water surface.

WATER LEVEL TRANSFERS.

Lake Ontario.

Tibbett's Point, N.Y.—Mean Lake plane elevation, for July, 31 days; August, 31 days; September, 25 days; October, 25 days and November, 16 days..... 245.964
Toronto, Ont.—Mean gauge readings for same period..... —3.012

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Lake Huron and the Georgian Bay.

Harbor Beach, Mich.—Mean Lake plane elevation for July, 31 days; August, 31 days; September, 30 days; October, 30 days, and November, 26 days.....	581.170
Collingwood, Ont.—Mean gauge readings for same period....	+1.073
Mackinaw City, Mich.—Mean Lake plane elevation for July, 31 days; August, 30 days; September, 24 days; October, 29 days, and November, 26 days.....	581.123
Collingwood, Ont.—Mean gauge readings for same period....	+1.078
Harbor Beach, Mich.—Mean Lake plane elevation for September, 30 days; October, 26 days, and November, 14 days....	580.942
French River, Ont.—Mean gauge readings for same period....	—1.083
Mackinaw City, Mich.—Mean Lake plane elevation for September, 24 days; October, 24 days, and November, 14 days....	580.911
French River, Ont.—Mean gauge readings for same period....	—1.050
Collingwood, Ont.—Mean gauge readings for September, 30 days; October, 26 days, and November, 14 days.....	+1.224
French River, Ont.—For same period.....	—1.083

GAUGE REFERENCE H.M.S

Toronto, No. 646½.....	11.475	above	zero	of	gauge.
Collingwood, " 668½.....	5.66	"	"	"	"
French River, French 26.....	11.77	"	"	"	"

From the above data, together with the results of the precise line connecting the Toronto and Collingwood terminal benches, and the section No. 1 special determination of the difference in elevation between the terminal benches at French River and North Bay, we are able to offer the following summaries:—

Definition.	Elevation.
Toronto, zero of gauge (from Tibbett's Point).....	242.952
Toronto, B.M. 646½.....	254.427
B.M. 668½, Collingwood above B.M. 646½ (precise line).....	333.05
Collingwood B.M. 668½.....	587.477
Collingwood, zero of gauge.....	581.817
French River, zero of gauge.....	579.510
French River B.M. (French 26).....	591.280
"Chippewa" above French River "26" (Section No. 1).....	59.235
North Bay B.M. "Chippewa".....	650.515
French River, zero of gauge (from Harbor Beach).....	579.859
French River B.M. "French 26".....	591.629
North Bay B.M. "Chippewa".....	650.864
French River, zero of gauge (from Mackinaw City).....	579.861
French River B.M., "French 26".....	591.631
North Bay B.M. "Chippewa".....	650.866
Collingwood, zero of gauge (from Harbor Beach).....	582.243
Collingwood B.M. 668½.....	587.903
Collingwood, zero of gauge (from Mackinaw City).....	582.201
Collingwood B.M. 668½.....	587.861

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DIFFERENCES.

Bench Mark "Chippewa."

Route.	Elevation.	Difference.
Tibbett's Point, Toronto, Collingwood, French River, North Bay.....	650.515	
Harbor Beach, French River, North Bay.....	650.864	0.349
Mackinaw City, French River, North Bay.....	650.866	0.351

Bench Mark 668½.

Tibbett's Point, Toronto, Collingwood.....	587.477	
Harbor Beach, Collingwood.....	587.903	0.426
Mackinaw City, Collingwood.....	587.861	0.384

A comparison of the above elevations by automatic gauge reduction with the elevations by the Precise party is as follows:—

B. M.	Location.	Elevation by Precise Party.	Elevation by automatic gauge.	Transfer.	Differences.
646½.....	Toronto.....	254.15	254.427	From Tibbett's Point.	+0.277
668½.....	Collingwood.....	587.20	587.477	" " "	+0.277
Chippewa....	North Bay via Rouses' Point.	649.86	650.515	" " "	+0.655
"	" " "	649.86	650.864	" Harbor Beach...	+1.004
"	" " "	649.86	650.866	" Mackinaw City....	+1.006

"The above digest is on the basis that the differences of elevations between the bench mark "1881" Chapman building, Rouses' Point, N.Y., Harbor Beach and Mackinaw City, Mich., are relatively correct. Such, however, cannot be the case absolutely, though it is reasonable to presume them to be relatively correct, judging by the number of years the gauge records have been kept, the extreme accuracy of the precise level lines entering into their connection, and the rigor of the 1903 adjustment of the United States level net."

The figures given by Mr. Chapleau as to elevations by water transfer differ slightly from the deductions made by Mr. Chaloner. But, of course, these will vary, according to number of simultaneous readings compared, eliminations of certain readings mostly affected by high winds, and extent of observations made. A complete adjustment could only be made after several years of simultaneous observations. The results, however, are close enough for all practical purposes and are a check on computations and precise level results.

The numerous checks obtained have permitted a compensation and adjustment of unavoidable small errors for all precise level lines, which practically eliminates the slight differences at connecting benches.

INSTRUMENT USED AND METHOD FOLLOWED.

The instrument used is the "Tacheometre Sanguet" (auto-reducteur), made in France under the direction of Mr. R. Steckel, for the Department of Public Works, improved and adapted by him for the Geodetic levelling under his direction.

The rods used are thirteen feet in length, made of three pieces of mahogany, screwed together, and divided into feet, tenths, hundredths and half-hundredths.

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The method of two simultaneous lines, A and B or double turning points was followed, with two rodmen, one for foresights, the other for backsights, readings being taken at equal distance from the instrument, fore and aft.

The difference in elevation found between two turning points as foresights must be the same when these two points become backsights.

Two sets of level readings are made, the first set being two foresights and then two backsights, and the second set being the reverse, the telescope making a half-circle between the first and the second set.

A double faced level, screwed to the telescope and kept out of adjustment, is used for the second set of level readings.

For full details of the instrument and rod, as well as for a complete description of methods the reader is referred to official reports to the Minister of Public Works, by Mr. R. Steckel, M. Can. Soc. C. E., for the years 1891, 1898 and 1906.

COST.

The field work in connection with the precise levelling commenced in October, 1904, and was completed in November, 1906, at a total expenditure of \$29,648.91, or \$31.36 per mile.

Apart from this the sum of \$5,219.85 was expended in office work, for reductions, computations, &c.

Compared with some other extensive precise levelling of a similar nature in other countries, this rate per mile seems high, but was unavoidable on account of the climatic conditions, which were very unfavourable throughout the whole period of field work.

Generally, precise work of this character is carried on only when weather conditions are favourable, but in this case there was an absolute necessity to continue the field work during late fall, winter and early spring, which are very unfavourable seasons and contributed largely to increase the cost. Under these conditions, it is believed that the cost per mile is very fair, and the results achieved as to precision of work performed rather remarkable.

TABLES OF ELEVATIONS.

In order that the elevations above Mean Sea Level, as determined along the different lines of precise levelling, may be available for future works, tabulated statements have been prepared, giving description of bench marks, their elevation and location. Two different lists are given as follows:—

1st. A reference list of the most important Permanent Benches and their elevations, with descriptive sketch showing exact location.

2nd. A complete reference list, with elevations, of all bench marks, and all other points, where these points are of a fairly permanent nature and can be easily located with the help of the description given.

It will be noticed that two columns of elevations are given, one showing the determinations as made in the field without any correction or adjustment, the other giving adjusted levels for same points, as deduced after correction of probable errors indicated at connecting bench marks by check lines, the probable errors being distributed in arithmetical ratio to the mileage covered.

However, in transferring the Mean Sea Level datum from the precise level line run from Montreal to North Bay, to the different sections of the survey proper, the adjusted levels were not used as they were not available during the time the field work was in progress. Therefore all elevations shown on plans are based on instrumental determinations without any correction.

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It was quite impossible to wait for the check lines to be completed and all the results computed before making the transfers to the territory under survey, as this would have entailed too long a delay to the whole work. As the main base line from Montreal to North Bay progressed, on account of the wide experience of the engineer in charge of the precise levelling, the great care and safe methods used, it was considered quite safe to allow the precise line to be tapped at once by the different sections of the survey and their levels reduced accordingly.

There were several legitimate reasons to believe that these levels could not be, at any point, more than a few inches out from the true determination above mean sea level, and the final results have shown that the elevations as determined are accurate enough for all engineering purposes.

The adjusted levels given are believed to be nearer the correct elevations than the other set of elevations, which was necessarily used, but this can be only settled when the lines receive a final check from a systematic geodetic level development. In so far as this survey is concerned, the results obtained have been satisfactory for all practical purposes, and final adjustments and refinements had to be left for the consideration of a geodetic corps, which no doubt before long will be a permanent branch of the Government service.

As mentioned above, the following lists of elevations refer only to the precise level lines; other elevations in regard to the route surveyed for the canal are fully recorded on the plans. As explained at the beginning of this report all elevations given on the plans are 0.19 to 0.25 higher than they should be if based on the actual figures given in the following list of precise level bench marks, for reasons stated.

Later, when there is time available, it will be possible to list all the bench marks, with their elevations, within the territory surveyed.

The elevations published herein are based upon the Greenbush bench mark, Governor's Island, New York, the accepted elevation of which, since a readjustment made in 1903, is 13.863 above mean sea level.

The initial point upon which these levels depend is a cross-cut on top of plinth course, north end of the Chipman building, at Rouses' Point, Clinton county, in the state of New York; the elevation of this bench mark is derived by a readjustment made in 1903 by the United States Coast and Geodetic Survey, and is now accepted as 107.955 feet above mean sea level, instead of 110.06 as used before the 1903 determination.

The bench marks described are mostly a chisel line on end of copper bolt driven horizontally in solid rock or in the vertical walls of buildings, bridge abutments or other substantial masonry structures. Some of the bench marks are simply a cross cut in solid rock

C
or masonry. All standard bench marks are marked thus B⊕M with their respective number in roman numerals cut in the stone.

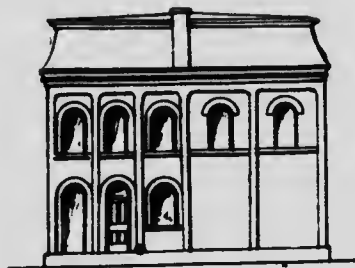
ROUSES' POINT TO CORNWALL

VIA ST. JOHNS, MONTREAL, LACHINE, ST. ANNE DE BELLEVUE,
VAUDREUIL, CASCADES, COTEAU LANDING.

DESCRIPTIVE LIST OF MOST IMPORTANT PERMANENT
BENCH MARKS.

Datum: Mean Sea Level, Atlantic Ocean at New York.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
⊕	Top of stone plinth, 20.6 ft. from N.E. corner, 1½ ft. above ground. N. end of Chapman building. ROUSES' POINT, N.Y.	107.96	117.96



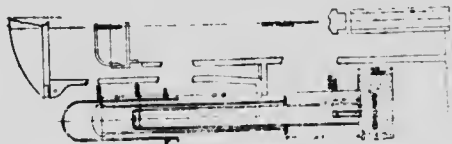
B.W. "A."

Cavity in bronze cap of bench well A, placed in 1884, in boundary
between Canada and the U. S. of America.....

93.5*

93.60

ROUSES' POINT—LACOLLE.



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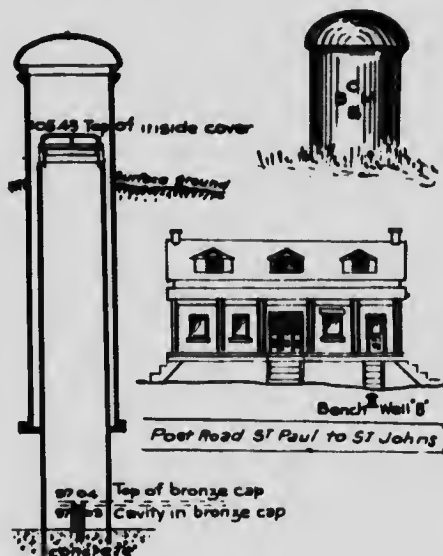
DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted
DCIII.	In 2nd course from top, N.W. face W. end of N. abutment of G.T.R. bridge over Lacolle river..... LACOLLE, P.Q.	129.92	129.95
			
DCV.	About 1½ ft. above ground, between 3rd and 4th window from front S. side of R. C. church..... ST. VALENTIN DE STOTTSVILLE, P.Q.	157.44	157.50
			

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DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted
B.W. "B."	Cavity on bronze cap of bench well B, placed in 1884, opposite front door of St. Paul's hotel..... ST. PAUL DE L'ILE AUX NOIX, P.Q.	97.03	97.10



DCIX.

In 2nd course from ground, 7-7 ft, S.W. corner-stone of R.C. church.
ST. BLAISE DE GRANDE LIGNE, P.Q.

141.69

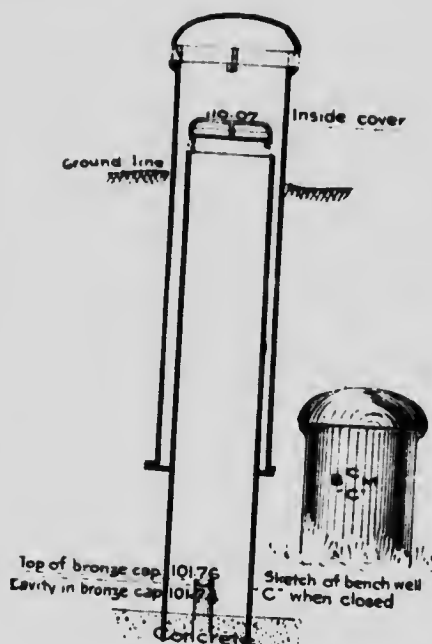
141.78



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DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
B.W. "C."	Top of bronze cap of bench well C, placed in 1884 inside St. John's barracks grounds. St. John's, P.Q.	101.70	101.89



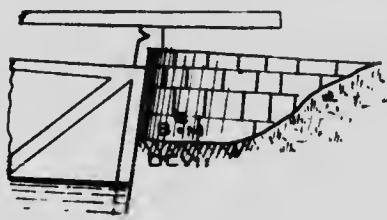
XDCVII.

In 4th course from top, lower end of curved wal, west side of lock
1, Chambly canal

St. John's, P.Q.

96.45

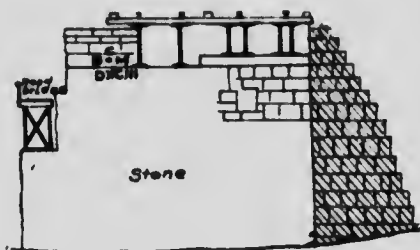
96.50



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DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

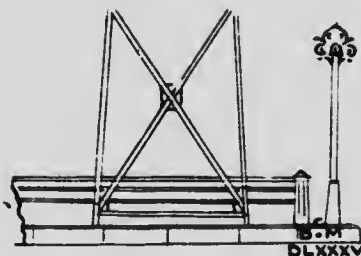
Bench Marks.	Description and Location.	ELEVATION	
		Height in feet.	Adjusted.
DLXXXIII	In 4th course from top, W. end of N. abutment of G.T.R. bridge over Lacadie river, 485 feet S. of mile 20 from Montreal..... LACADIE, P.Q.	110.52	110.53



DLXXXIX.	In top course, east face of E. half of N. abutment of beam culvert, 1,570 feet N. of mile 13 from Montreal..... BROSSARD, P.Q.	48.82	49.02
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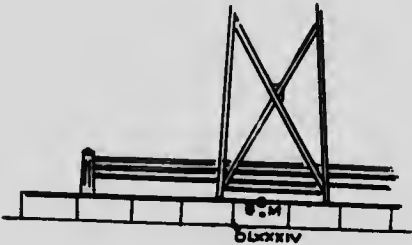
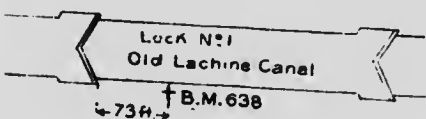


DLXXXV.	In stone base of iron railing, N. side of vehicle road, close to 1st steel arch from St. Lambert end of Victoria bridge..... ST. LAMBERT, P.Q.	67.55	67.78
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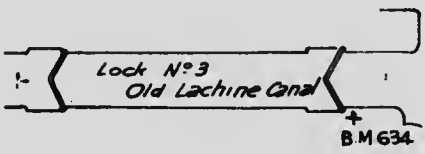
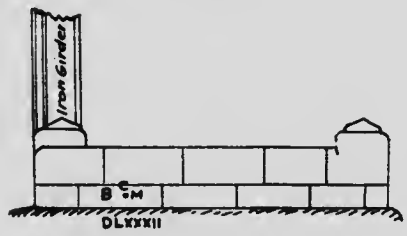
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DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DLXXXIV.	In S. face of stone base of N. iron railing, opposite 1st steel arch Point St. Charles end of Victoria bridge..... POINTE ST. CHARLES. 	67.18	67.42
638	† Cut on coping, 96 ft. from S. upper gate old lock 1, Lachine canal..... MONTREAL. 	36.94	37.19
N	In plinth, of Montreal Custom House on Callieres street close to Commissioner street..... MONTREAL.  Callieres St Elevation	49.03	49.28

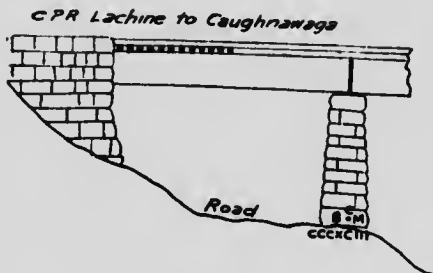
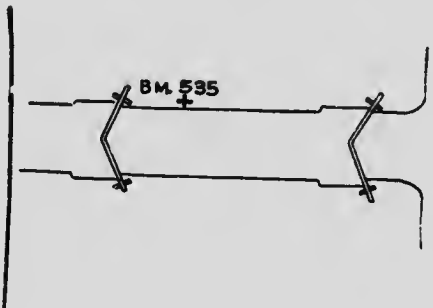
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DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
L.	In third course from ground $4\frac{1}{2}$ feet from Forsyth street, E. face of S. abutment of C.P.R. overhead crossing opposite Longueuil ferry..... MONTREAL.	37.76	38.02
			
	+ Cut on coping one foot from S. edge, 5 feet E. of S. lower gate of old lock 3, Lachine canal..... MONTREAL.	58.61	58.87
			
DLXXXII.	n base course, $4\frac{1}{2}$ feet from W. end of E. stone guard wall, S. abutment of Côte St. Paul bridge over Lachine canal..... MONTREAL.	72.74	73.00
			

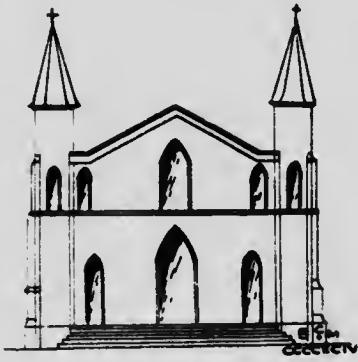
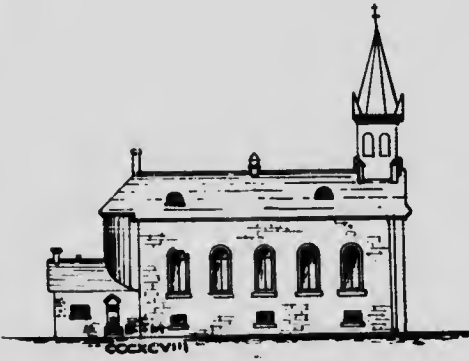
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DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
3000XCIII.	In 2nd course above ground, S.W. face of 1st pier, Lachine end of C.P.R. bridge over St. Lawrence river..... LACHINE, P.Q. 	93.85	94.13
535	+ Cut on coping above centre of new lock 5 of N. side of Lachine canal..... LACHINE, P.Q. 	74.42	74.71

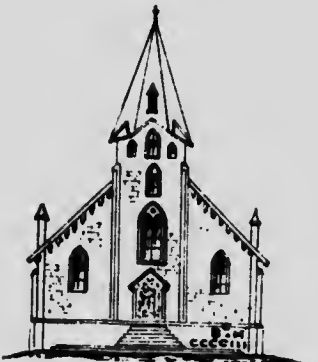
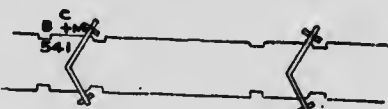
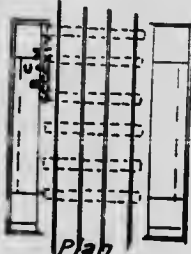
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DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
CCCXCIV.	In 3rd course above foundation front of buttress, S.E. corner of R. C. church..... LACHINE, P.Q.	82.87	83.16
			
CCCXCVIII.	In first cut stone above ground, west face, about one foot from rear end of R. C. church..... DORVAL P.Q.	93.53	93.85
			

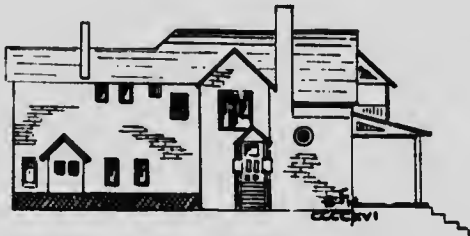
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DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted
CCCCIII.	In fourth stone above ground, S.E. corner of R. C. church..... 1  POINTE CLAIRE, P.Q.	83.95	84.28
			
541	+ Cut on coping W. recess of lower new lock gate at Ste. Anne de Bellevue..... ST ANNE DE BELLEVUE P.Q.	81.4	81.4
			
CCCCXIV	In north face of stone railing about one foot above coping, S. side of S.E. abutment of G.T.R. bridge between Ile Perrot and Vaudreuil..... ILE PERROT, P.Q.	91.89	92.27
 			

SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
CCCCXVI.	About 3 feet above ground, 2 feet from S. W. corner of Geo. Foster's residence 1½ miles from Vaudreuil station..... VAUDREUIL, P.Q.	84.66	85.05
			
CCCCXVIII.	About 2½ feet above coping N. face of stone stairway leading up to lock 2, Soulanges canal..... CASCADER, P.Q.	95.37	95.75
			
CCCCXXI.	About 2 feet above coping N. face of stone stairway leading up to lock 4, Soulanges canal..... CASCADER, P.Q.	142.02	142.39
			

7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
CCCCXIII.	About 14 feet above top step, N. face of stone buttress, N.W. corner of R. C. church CEDARS, P.Q.	158.39	158.75



CCCCXVII.

In first stone above plinth, W. side of E. entrance to R. C. church.
COTEAU DU LAC, P.Q.

158.48

158.81



A. 1908

used.

IONS.

Adjusted.

SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS	
		Instru- mental.	Adjusted.

154.75

547

Iron bolt driven horizontally into N. face S.W. corner G.T.R. bridge
over canal road to Coteau du Lac, S. side of canal

160.98

161.30

COTEAU LANDING, P.Q.



DLXXVIII.

In 2nd course from base, S. end of E. abutment of G.T.R. bridge,
660 feet E. of St. Zotique station

154.65

154.97

St. ZOTIQUE, P.Q.



58.81

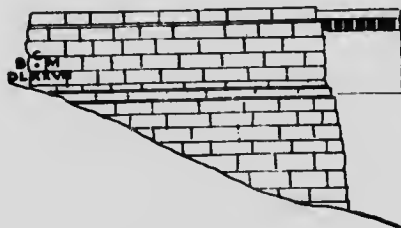
DLXXVII.

In 4th course from top W. end of S. face of W. abutment of G.T.R.
bridge over River Beaudette

169.45

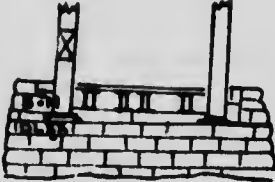
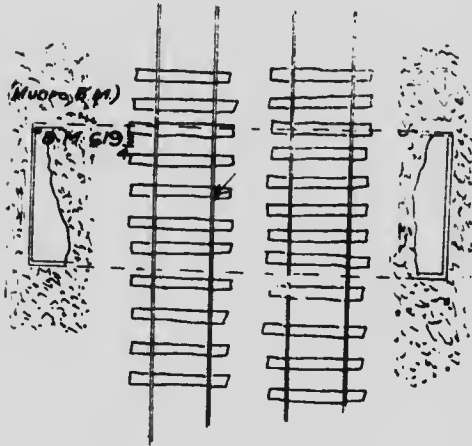
169.76

RIVIERE BEAUDETTE, P.Q.

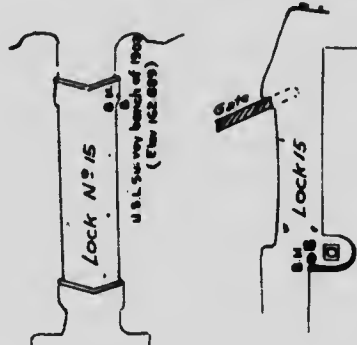
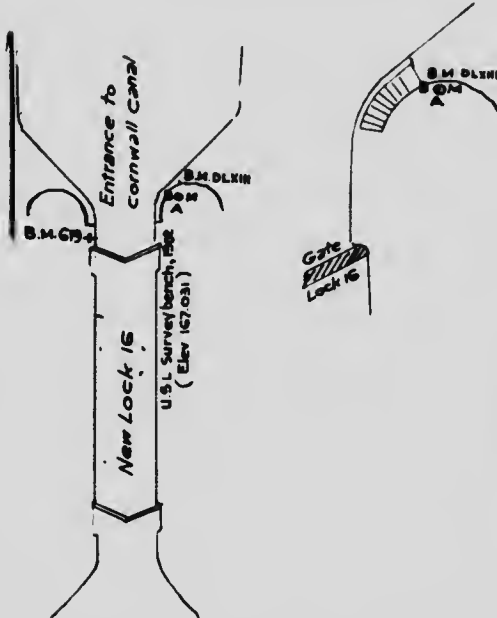


7-8 EDWARD VII., A. 1906

Descriptive List of most Important Permanent Bench Marks—Continued.

Bench Marks	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DLXX	End course from top S. end of W. abutment of G.T.R. bridge over Black river. LANCASTER, ONT. 	102.97	103.27
6197	Corner of coping S. end of G.T.R. culvert at mile 63. SUMMERTOWN, ONT. 	180.83	181.13

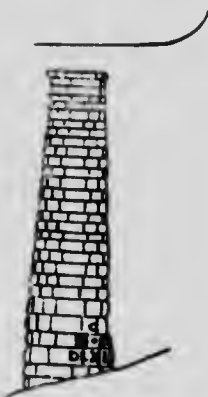
DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
"B."	3 feet E. of W. edge of stone 4-4 ft. S. of N. face of S. wall of old lock 15, U.S.L.S.B.M. of 1902 (elevation 162.880)..... CORNWALL, ONT.	162.50	162.80
			
"A."	+ 63 feet S. of front face of wall, 1-9 feet from rear edge of new entrance lock, U.S.L.S.B.M. of 1902 (elevation 167.031)..... CORNWALL, ONT.	166.73	167.03
			

7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

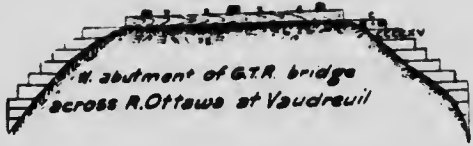
Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
DLXI.	In N.E. corner, 3rd course from base, N. shore pier of N. Y. and O. Railway bridge over St. Lawrence river..... CORNWALL, ONT.	165.36	165.66



VAUDREUIL TO NORTH BAY.

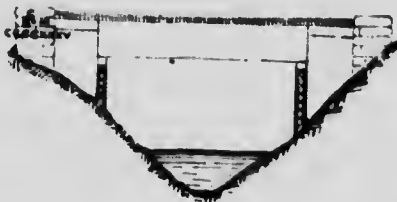
DESCRIPTIVE LIST OF MOST IMPORTANT PERMANENT BENCH MARKS.

Datum: Mean Sea Level, Atlantic Ocean at New York.

Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Lachine B.M. = 94.10 (As used on Survey).	Instru- mental (Via St. Lam- bert to Vau- dreuil).	Ad- justed.
CCCCXV.	Chisel line in end of copper plug, driven horizontally into west face, south of track of west abutment of G. T. R. bridge over Ottawa river.	88.49	88.30	88.61
VAUDREUIL.				
				
CCCCXXI	Chisel line in end of copper plug, driven horizontally into east face of base of turret on south east corner of R. C. church.	86.71	86.55	86.89
VAUDREUIL.				
				

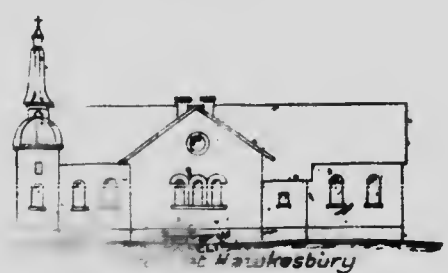
7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Lachne P.M. +94.10 (As used on Survey).	Instro- umental (Via St. Lam- bert to Vau- dreuil).	Ad- justed.
CCCCXXXV	Chisel line in end of copper plug, driven horizontally into south side of west abutment of C.P.R. bridge over Rapquette river, parish of Rigaud. COUNTY OF VAUDREUIL.	98.72	98.53	98.80
				
CCCCXXXVI	Chisel line in end of copper plug, driven horizontally into south face of west abutment of C.P.R. bridge over Riviere à la Grasse. RIGAUD.	99.36	99.37	99.74
				
CCCCXXXVIII	Chisel line in end of copper plug, driven horizontally into stone foundation of wooden house, general store and office, of Wm. Brown. POINTE-à-la-Croix.	83.02	83.73	84.13
				

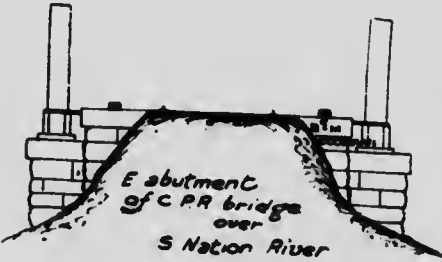
SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Tide-line 19 M. = 94.10 (As per Survey)	Instru- mental (Via St. Lambert to Vau- dreuil).	Ad- justed
XII	Chisel line in end of copper plug, driven horizontally into foundation near east corner of north front of R. C. church. ST. EUGENE.	101.73	101.54	101.9
 St Eugene R.C Church				
CCCL1	Chisel line in end of copper plug, driven horizontally into stone between two basement windows, west end of wing on west side of R. C. church. HAWKESBURY.	148.11	147.92	148.34
 St Hawkesbury				

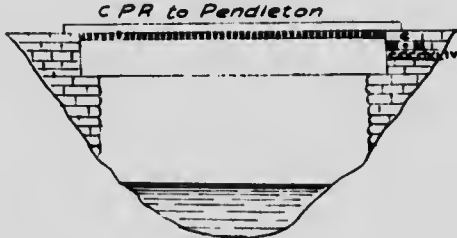
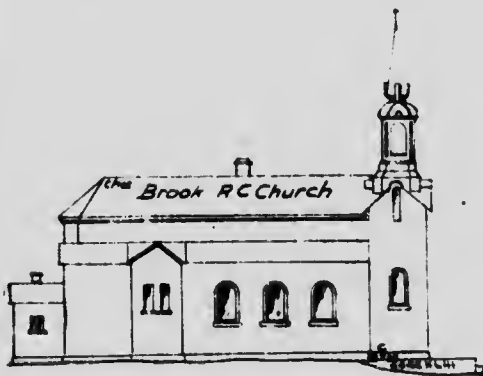
7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Lachine B. M. —94.10 (As used on Survey).	Instru- mental (Via St. Lam- bert to Vau- dreuil).	Ad- justed.
CCCCXLIX	Chisel line in end of copper plug, driven horizontally into north wall, stone foundation of I. N. Carriere's store and post office of McAlpins COUNTY OF PRESCOTT.	223.47	223.28	223.69
				
CCCCXLVII	Chisel line in end of copper plug, driven horizontally into north side of stone foundation of house owned by Grand Hotel Co. CALEDONIA SPRINGS.	166.90	166.80	167.23
				
CCCCXIAI	Chisel line in end of copper plug, driven horizontally into coping stone in east end north of track, of north abutment of C. P. R. bridge over Nation river PLANTAGENET.	168.78	168.50	169.05
				

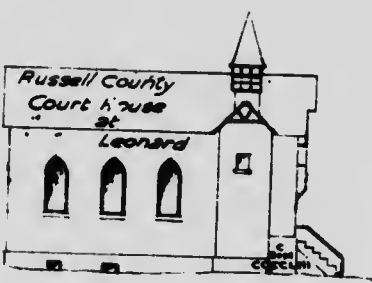
SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

		ELEVATIONS.		
Bench Marks	Description and Location.	Based on Lachine B. M. = 94.10 (As used on Survey).	Instru- mental (Via St Lam- bert to Van- drevil).	Ad- justed.
CCCCXLIV	Chisel line in end of copper plug, driven horizontally into stone in second course from top, southeast side of northeast abutment of bridge (bearing mileage 57.1) over Dickensons brook COUNTY OF PRESCOTT.	192.51	192.32	192.78
				
CCCCXLIII	Chisel line in end of copper plug, driven horizontally into stone in north face of foundation under steeple, northwest corner of R. C. church THE BROOK.	210.02	209.83	210.31
				

7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

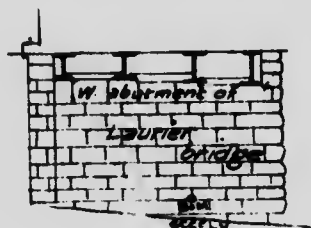
Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Lachine B.M. = 94.10 (As used on Survey).	Instru- mental (Via St. Lam- bert to Vail- drenil).	Ad- justed.
CCCLIII	Chisel line in end of copper plug, driven horizontally into stone foundation in north side of projection or facade, on front or west end of small court house on east side of road, and second building south of C. P. R. track, at LEONARD.	271.57	271.38	271.87
				
CCCLIV	Chisel line in end of copper plug, driven horizontally into stone in third course from top north face of east abutment of C. P. R. bridge (M. and O. line) over Rideau river HURDMANS BRIDGE.	194.87	194.68	195.22
				

SF 510101 PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

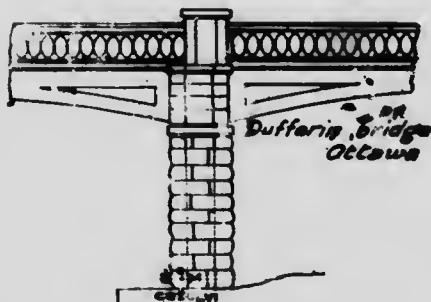
Bench Mark	Description and Location.	ELEVATIONS.		
		Based on Tachline 18 M. = 94.10 (As used on Survey).	Instru- mental (Via 50 Foot level) + 0.00 in oil.	Ad- justed.
CCCCIV	Chisel line in end of copper plug, driven horizontally into stone, about one foot above ground in east or inner face of west abutment of Laurier bridge.	217.38	217.12	217.72

OTTAWA.



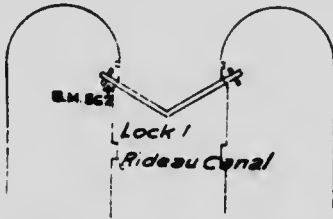
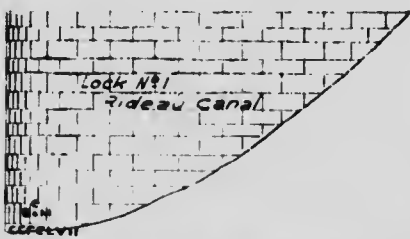
CCCCVI	Chisel line in end of copper plug, driven horizontally into first stone above ground, north end of first pier west of Rideau canal, and Dufferin bridge, Wellington street.	213.01	212.82	213.35
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OTTAWA.



7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

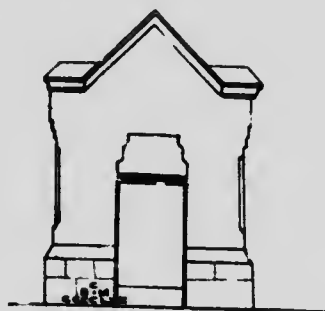
Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Lachine H. M. = 94.10 (As used on Survey).	Instru- mental (Via St. Lam- bert to Van- driuil).	Ad- justed.
562	Cross cut in top of coping of west side, just north of lower gate of lock No. 1, Rideau canal. OTTAWA.	154.33	154.14	154.68
				
CCCLVII	Chisel line in end of copper plug, driven horizontally into stone in thirteenth course from top, northwest face of curved wall, west side of entrance to lock No. 1, Rideau canal. OTTAWA.	135.37	135.18	133.72
				
CCCLIX	Chisel line in end of copper plug, driven horizontally into stone in south, or Albert street face, just behind south corner of turret on southwest corner of City Hall. OTTAWA.	240.55	240.36	240.89
				

SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Machine B.M. = 94.10 (As read on Vau- dreuil).	Instru- mental (Via St. Lam- bert to Vau- dreuil).	Ad- justed.
CCCCLXX	Chisel line in end of copper plug, driven horizontally into dressed stone in east face of portico, just south of door, rear entrance of Hull R. C. church, corner of Victoria street and Laurier avenue.....	177.90	177.71	178.25

HULL.

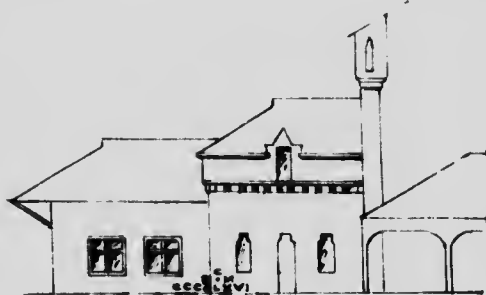


CCCCLXVI

Chisel line in end of copper plug, driven horizontally into stone foundation, front, or Broad street face, of second class waiting room of Union station (C. P. R.).....

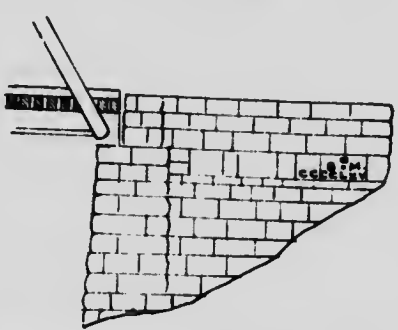
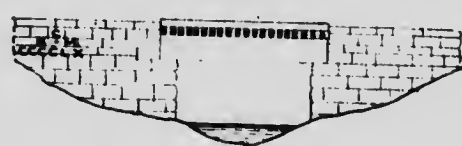
184.72 184.53 185.06

OTTAWA.



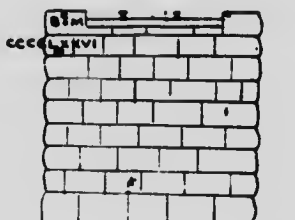
7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location	ELEVATIONS.		
		Based on Lachine B.M. —94.10 (As used on Survey).	Instru- mental (Via St. Lam- bert to Vau- drenil).	Ad- justed
C ¹ CCLXV	Chisel line in end of copper plug, driven horizontally into stone in third course from top, upper or west face of south abutment of Prince of Wales (C. P. R.) bridge, Chaudiere..... OTTAWA.	185.54	185.35	185.89
				
CCCCCLXII	Chisel line in end of copper plug, driven horizontally into stone foundation of east or front wall of south wing of house of John Whitton, second house north of C. P. R. track, west side of cross road at village of..... BRITANNIA.	203.38	203.19	203.74
				
CCCCCLX.	Chisel line in end of copper plug, driven horizontally into stone in 4th course from top, N.E. face of S.E. abutment of Grand Trunk Railway bridge over Carp river, Huntley, and W. of town of..... CARP.	307.54	307.35	307.93
				

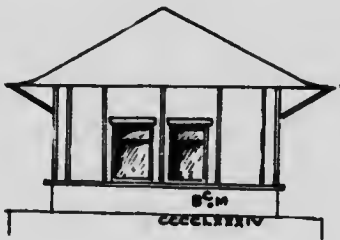
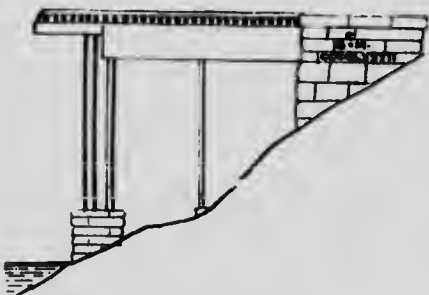
SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Machine B. M. = 94.10 (As used on Survey).	Instru- mental (Via St. Lam- bert to Van- drevil).	Ad- justed.
CCCCLXXVI.	Chisel line in end of copper plug, driven horizontally into S.E. face of coping stone on S. corner of N.W. abutment of G.T.R. bridge over Mississippi river,	290.32	290.13	290.73
	GALETTA.			
				
CCCCLXXVII.	Chisel line in end of copper plug, driven horizontally into stone in centre of N. end of C.P.R. station of,	300.74	300.55	301.17
	ARNPRIOR.			
				
CCCCLXXXVII	Chisel line in end of copper plug, driven horizontally into stone foundation of front or N.E. face of brick schoolhouse	267.26	267.07	267.11
	SAND POINT.			
				

7-8 EDWARD VII., A. 1906

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

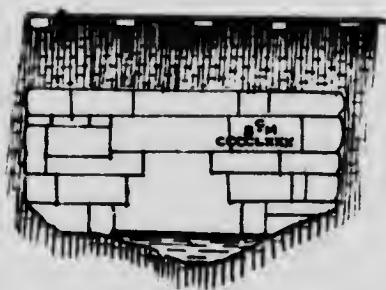
Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Machine B.M. = 94.10 (As used on Survey).	Instru- mental (Via St. Lam- bert to Vau- dreuil).	Ad- justed.
CCCCCLXXXIV.	Chisel line in end of copper plug, driven horizontally into stone in E. end of railway station.....	418.01	417.82	418.48
	RENEW.			
				
CCCCCLXXXII.	Chisel line in end of copper plug, driven horizontally into stone in 3rd course from top, N.E. face of N.W. abutment of C.P.R. bridge over Bonnechere river.....	385.53	385.34	386.00
	RENEW.			
				

SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS		
		Based on Lachine B.M. = 94.10 (As used on Survey).	Instrumental (Via St. Lambert to Vaudreuil).	Adjusted
CCCCLXXX.	Chisel line in end of copper plug driven horizontally into stone in 2nd course from top, N.E. end of large covered stone culvert under C.P.R. (mileage 801), and on lot 19, con. 11, township of Ross.	509.69	509.50	510.19

COUNTY OF RENFREW.

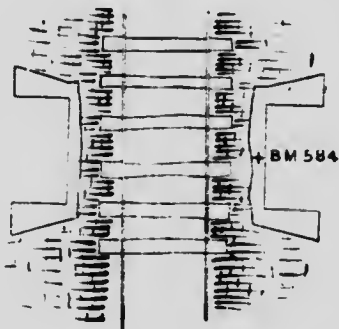


584

Cross cut in top, at centre of W. end of little concrete culvert under C.P.R., about 1,140 feet S. of mile post 93 and opposite Mrs. Crawford's property lot 14, con. 11, township of Westmeath.

444.49	444.30	445.01
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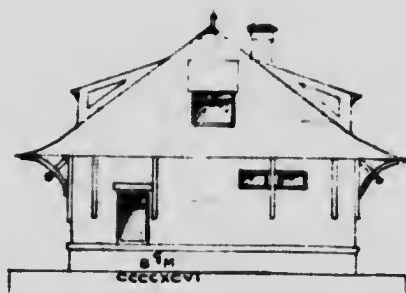
COUNTY OF RENFREW.



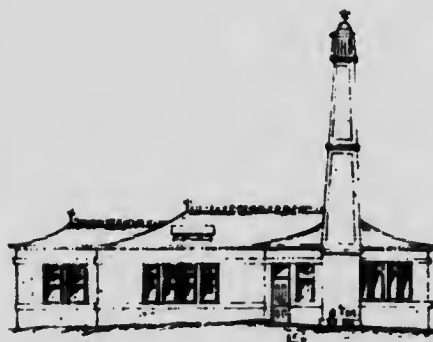
7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Lachine B.M. = 94.10 (As used on Survey).	Instru- mental (Via St. Lam- bert to Van- drevil).	Ad- justed.
CXXXCVI.	Chisel line in end of copper plug, driven horizontally into stone at W. end of C.P.R. station at Pembroke.	382.48	382.29	383.0*

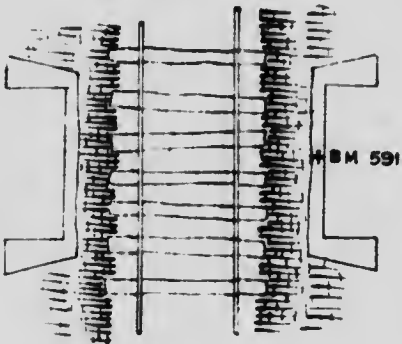
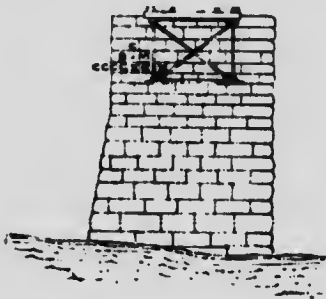


DIII.	Chisel line in end of copper plug, driven horizontally into stone in E. face of foundation of large chimney of Pembroke water works.	377.64	377.45	37.10
	Pembroke.			



SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—*Continued.*

Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Machine B. M. 91-10 (As used on Survey).	Instru- mental (Via St. Lam- bert to Van- dread).	Ad- justed.
501	Cross cut in top at centre of N.E. end of covered concrete culvert under C.P.R., 225 feet N.W. of station and just S.E. of road to Ottawa river and village of POTAWAWA.	463.55	463.36	464.12
				
CCCCXCIX.	Chisel line in end of copper plug, driven horizontally into stone in 4th course from top, S.E. or inner face of N.W. abutment, S.W. of track of C.P.R. bridge over Potawawa river...	455.72	455.52	456.29
POTAWAWA. 				

7-8 EDWARD VII., A. 1906

DESCRIPTIVE List of most Important Permanent Bench Marks *Continued.*

Bench Mark.	Description and Location.	ELEVATIONS.		
		Based on Tachline B. M. 366.10 by re-4 on Survey	Instrumental A.M. St. Lam. bert to Van derbilt	Ad- justed
CCCCVALL.	This L line in end of copper plug, driven horizontally into stone paving S. and inward at S. side of C. P. R. locomotive turn table at	521.94	521.41	522.23

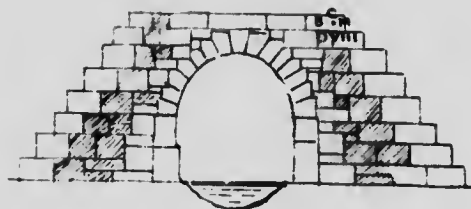
CHALK RIVER.



- DA III. A set line in end of copper plug, driven horizontally into end of
top after step on S. corner of large arched stone culvert under
C. P. R., 10.06 miles from Chalk River and on lot 9, con. VI,
township of Dead.

568.82

NEISSING DISTRICT.



SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—*Continued.*

Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Lachine B.M. = 94.10 (As used on Survey)	Instan- taneous (Via St. Levee to Lake Superior)	Ad- justed.
DXXI.	Top of copper plug, driven vertically into the best rock on C.P.R. right of way, just beside N. fence, 40 m. N. of track and 100 feet N. of railway station.	474.36	474.14	475.02

Rock 1000.

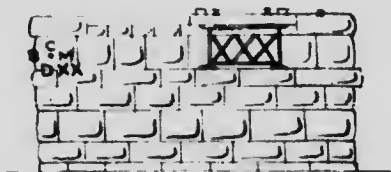


DXX.

Chisel line in end of copper plug, driven horizontally into E. face of stone on S. end of 2nd course from top, E. or inner face of W. abutment of C.P.R. bridge over Grant's brook (mileage, 623.80 from Chalk River, and on lot 31, Mattawa road lots 64 Head ...)

464.58 464.39 465.25

SPINNING DISTRICT



7-8 EDWARD VII., A. 1906

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Lachine B. M. + 94.10 (As used on Survey).	Instru- mental Via St. Lam- bert to Van- Grenel).	Ad- justed.
DXXV.	Top of copper plug, driven vertically into top at W. side of small rock projection or peninsula on S. shore of Ottawa river, at foot of road leading from government road to Ottawa river, 1 mile W. of mouth of Bassett river, and above head of Rocher Capitaine rapids.	450.83	450.64	451.51

NEPESING DISTRICT



- DXXIV. Top of copper plug, driven vertically into solid rock at foot of cliff, S.E. shore of Ottawa river, at foot of lower or Deux Rivières rapids, and about 200 feet below end of little point, where ruins of M. B. Mason's old residence stand.

454.63 454.41 455.15

DEUX RIVIERES



SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

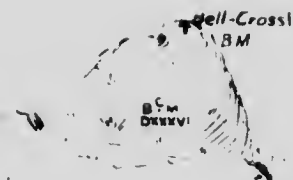
Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Lachine B. M., +91.10 As used on Survey.	Instrumental (VIA ST. T.M.) Adjusted to Ann. dred.	Ad- justed.
DXAA	Chisel line in end of copper plug, driven horizontally into N. side of boulder just S. of station platform, about 26 feet from W. end C.P.R. station.	531.63	531.44	532.36

KIDDER



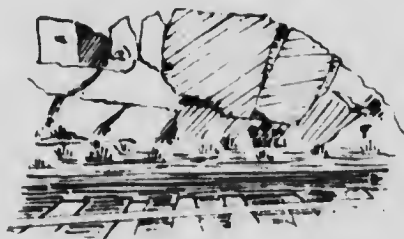
DXAAVI	Chisel line in end of copper plug, driven horizontally into S. side of boulder bearing A. S. S. Cross and Bell's B.M., on S. shore Ottawa River, at the old cleared survey line from runway to river, 1 mile E. of C.P.R. station of	500.72	500.53	501.47
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CUTAWAY



DXVI	Chisel line in end of copper plug, driven horizontally into top of rock in cut 15 feet N.E. of track and 600 feet S.E. of mile post 50 from C.P.R. station	620.22	620.03	630.00
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KINGSTON DISTRICT



SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.		
		Based on Machine H. M. +94.10 (As used on Survey).	Instru- mental (Via St. Lam- bert to Vau- dreuil).	Ad- justed.
DLVII.	Chisel line in end of copper plug, driven horizontally into shallow rock cut 12 feet N. of track and 1,852 feet W. of mile post 901 from Chalk River, at Mr. Wm. Hill's property, E. of	756.84	756.65	757.64

RETURN RAIL



- DLIII. Top of copper plug, driven vertically into flat exposed in rock, 30 feet N. of track and 745 feet E. of mile post 909 from Chalk River and N. of

LAKE NASHVILLE

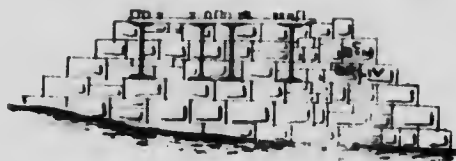
782.63 782.44 783.45



- DLXIV. Chisel line in end of copper plug, driven horizontally into 2nd course from top northwest face at west end of southeast abutment of C.P.R. bridge over Chippewa creek, southeast of

NORTH RAY

649.80 649.66 650.7



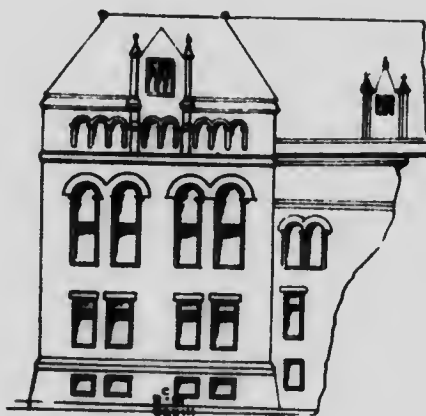
TORONTO TO NORTH BAY.

DESCRIPTIVE LIST OF MOST IMPORTANT PERMANENT BENCH MARKS.

Datum: Mean Sea Level, Atlantic Ocean, at New York.

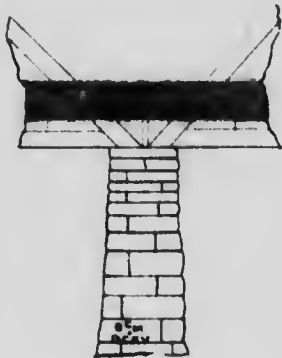
Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted
DCXIII.	Chisel line in end of copper plug driven horizontally into stone in first course above ground in east, or James street side, and about 24 feet from south corner of City Hall.		296.96

TORONTO.



7-8 EDWARD VII., A. 1908

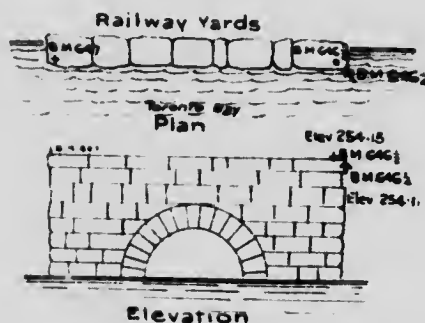
DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCXV.	Chisel line in end of copper plug driven horizontally into stone in first course wholly above ground, in west face of fourth pier from north abutment, of bridge over railway tracks, at foot of John street.....		254.33
	TORONTO.		
			
No. 12. Elev. 30.17.	City Engineer's bench mark, projecting shaft on small iron plate screwed into stone in first course below coping, east face of north abutment of Bathurst street bridge.....		275.01
	TORONTO.		
			
Zero.	Georgian Bay Ship Canal automatic water gauge register, in small cabin on north edge, about 30 feet from west end of Queen's Wharf.....		242.87
	TORONTO HARBOUR.		
Zero.	Federal Public Works Department automatic water gauge register in shed about 60 ft. from west end of Queen's Wharf.....		243.28
	TORONTO HARBOUR.		
Zero.	Toronto Harbour Commissioners' elevated staff water gauge in same shed and beside Public Works Department gauge register. This staff gauge has an independent strip of wood fastened to it, graduated into decimals of a foot, and agreeing in readings with Public Works Department gauge register.		245.00
	Queen's Wharf.....		
	TORONTO HARBOUR.		

SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

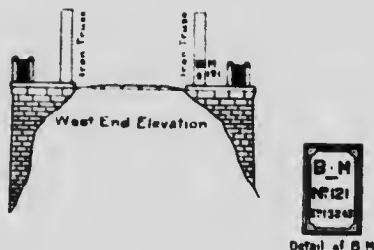
Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
Zero.	Toronto Harbour Commissioners' simple staff gauge, fastened to outer or south face of Queen's Wharf, about 200 feet from west end, and gauge agreeing in readings with original of elevated staff gauge above mentioned.  TORONTO HARBOUR.	243.00	
647	cross cut in top of coping stone at south-west corner of large arched portal of a sewer about 800 feet north-west of west end of Queen's Wharf and 100 north shore of TORONTO BAY.	254.11	



No. 121.
Elev. 132.43.

City Engineer's bench mark No. 121, protruding shelf on small iron plate about 2 feet above floor of bridge, screwed into west end of iron truss at west end, south side of Dundas street bridge.

377.08

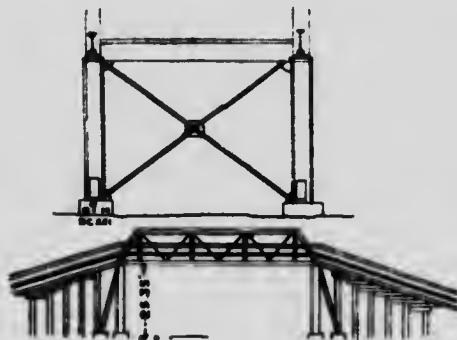


7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks--Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCXXI.	Chisel line in end of copper plug, driven horizontally into north face of stone pier under east column of iron trestle supporting south end of bridge over C.P.R. tracks, overhead crossing of Weston road, just west of C.P.R. station.....		306.63

TORONTO JUNCTION.

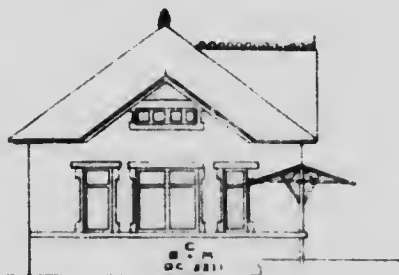


DCXXII.

Chisel line in end of copper plug driven horizontally into stone, about 3 feet above ground, under centre window east end of C.P.R. station at

407.26

NORTH TORONTO.



SESSIONAL PAPER No. 19a

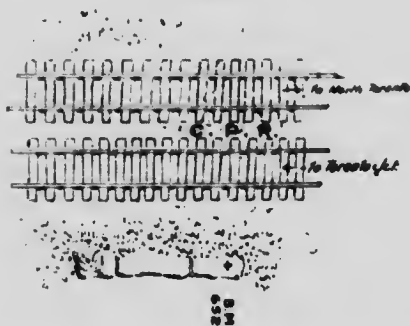
DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location	ELEVATIONS.	
		Instrumental.	Adjusted.

- 1002 Cross cut in top of stone at south east corner of stone box culvert under C.P.R. from Toronto Jet, to North Toronto opposite China Oil Co's store house, and 18 feet west of crossing of G.T.R. to Harbord North Bay.

3903.87

TORONTO.



- 18 XXX Closed line in end of copper plug driven horizontally into stone opposite fourth altar-step from bottom in north face of south retaining wall at east end of stone arch culvert under G.T.R., just north of factory of the Worsted & Brand Co.

132.00

132.60

BAYVIEW.



- 18 XXII Closed line in end of copper plug driven horizontally into stone, in south face of small wing, or retaining wall at north side, east of track of covered stone culvert under G.T.R., Lot 18, con. 111 W., township of York.

132.26

132.29

COUNTY OF YORK.



7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	Elevations.	
		Instrumental.	Adjusted.
DCXXVIII.	Close line in end of copper plug driven horizontally into second stone from south corner, first course below coping, east, or inner face of retaining wall over west end of large covered stone culvert under G.T.R., 210 paces south of station of Thornhill, and opposite Mrs. Teasdale's property, lot 15, con. 111, township of Vaughan.	623.82	623.86
COUNTY OF YORK.			



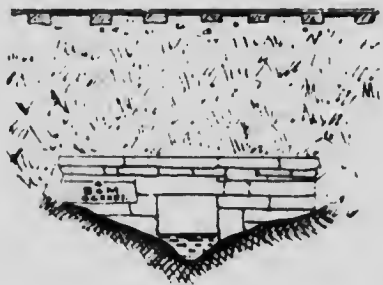
DCXXXI.

Close line in end of copper plug driven horizontally into stone in west end of stone box culvert under G.T.R., about 140 yards north of station of King City, lot 5, con. 14, township of King.

947.50

947.58

KING CITY.



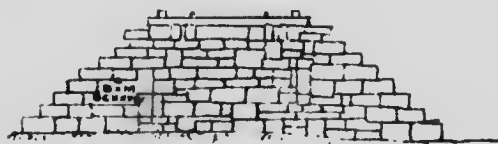
DCXXXIV.

Close line in end of copper plug driven horizontally into stone opposite fourth altar-step from ground in south face of north abutment of bridge culvert under G.T.R., about 150 yards south of mile post 28 from Toronto and on lot 14, con. 1 township of King.

965.64

965.74

COUNTY OF YORK.

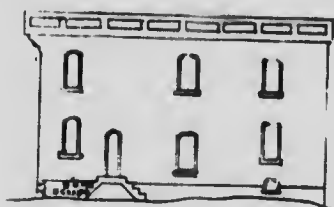


SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCXXXV.	Chisel line in end of copper plug, driven horizontally into stone in top course of foundation—100 feet from south corner of east end of shoe factory belonging to Underhill, Seaman & Co.	884.65	883.70

ALBANY.

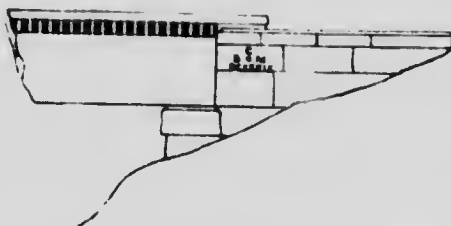


DCXXXIX.

Chisel line in end of copper plug, driven horizontally into second stone from top east side of north abutment of G. E. R. bridge over Newmarket branch of Holland river, just north of Timothy street crossing.

777.28 777.41

NEWMARKET.

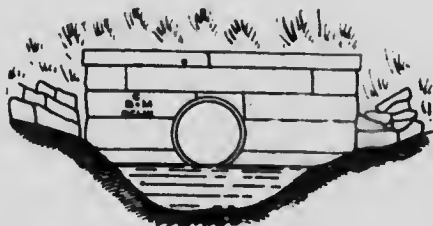


DCLIII.

Chisel line in end of copper plug, driven horizontally into stone in second course below coping, west end of covered stone culvert under G. E. R. one mile north of Bradford, about 375 feet north of mile post 43 from Toronto and on lot 1, con. VIII, township of West Gwillimbury.

726.46 726.32

COUNTY OF SIMCOE.



7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.

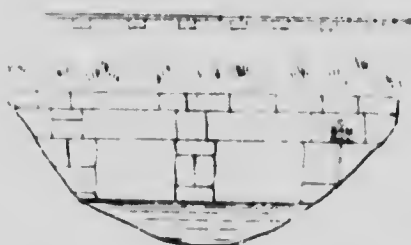
10 L.

Chisel line in end of copper plug driven horizontally into stone in first course from top, west end near south corner of double box culvert under G. I. R., about 330 feet north of town line, and on lot 21, con. 1, township of Innisfil.

747.19

747.68

COUNTY OF SIMCOE



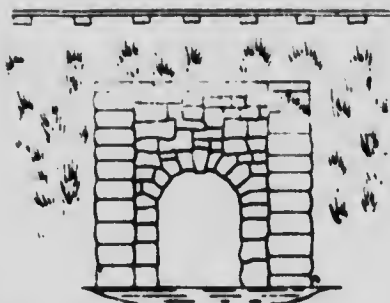
10 LIA II

Chisel line in end of copper plug driven horizontally into end of first altar step below coping of retaining wall on north side east end of arched stone culvert under G. I. R., about 470 yards north of Lefox crossing, and on Henry Lefox's property, lot 21, con. 1, township of Innisfil.

757.50

757.70

COUNTY OF SIMCOE



10 LIII.

Chisel line in end of copper plug driven horizontally into stone in west end of double box culvert under G. I. R., about 150 yards south of Grangeville crossing, and on lot 17, con. 1, township of Innisfil.

806.24

806.47

COUNTY OF SIMCOE

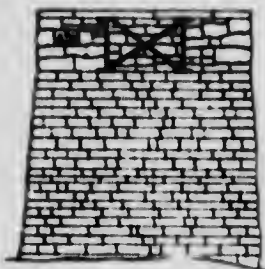


SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

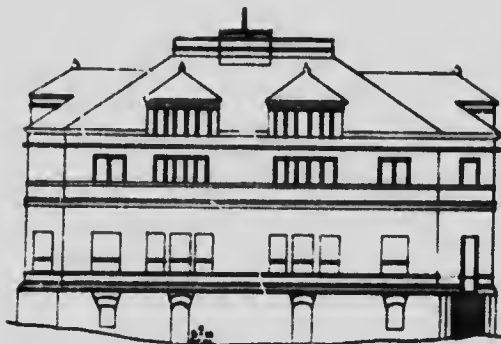
Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCXLII	Chisel line in end of copper plug driven horizontally into stone 3 feet below, and south-west of track, south-east of inner face of north-west abutment of G.T.W. bridge over Lovers' Creek, township of Inish.	780.41	780.05

COUNTY OF SIMCOE.



DCXL.	Chisel line in end of copper plug driven horizontally into stone foundation 1.8 feet above ground, 5.15 feet east of west door, south wall, rear of post office	732.18	732.14
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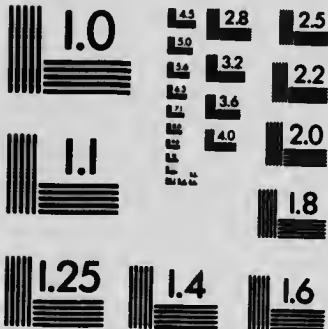
BARROW.





MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)

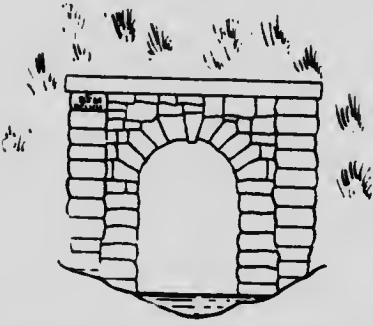
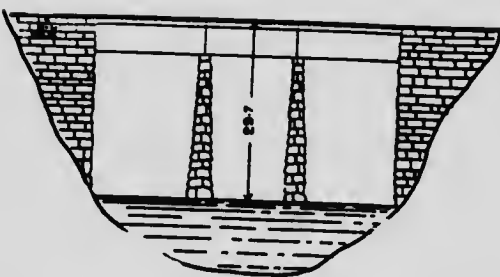
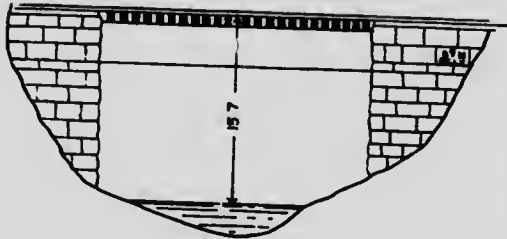


APPLIED IMAGE Inc

1653 East Main Street
Rochester, New York 14609 USA
(716) 482 - 0300 - Phone
(716) 268 - 5989 - Fax

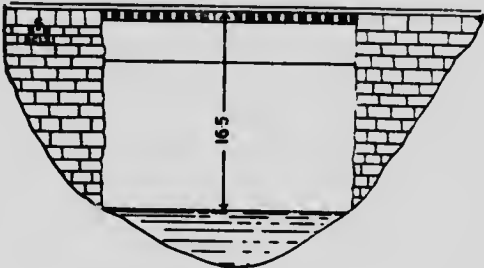
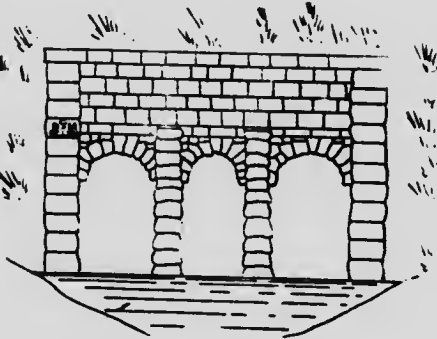
7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
DCLVII	Chisel line in end of copper plug driven horizontally into end of first altar step below coping, on east retaining wall, north end of large arched culvert under G.T.R., about 500 yards from front of lot 32, con. IX, township of Essa. COUNTY OF SIMCOE.	732.51	732.79
			
DCLIX.	Chisel line in end of copper plug driven horizontally into stone in second course from top, north side of east abutment of G.T.R. bridge over Nottawasaga river..... ANOUS.	628.83	629.13
			
DCLX.	Chisel line in end of copper plug driven horizontally into stone in second course from top, south face of east abutment of G.T.R. bridge over Pine river..... ANOUS.	621.25	621.59
			

SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru-	Adjusted.
DCLXI.	Chisel line in end of copper plug driven horizontally into stone in second course from top, south-west side of north-west abutment of G.T.R. bridge over Mad river, Essa. COUNTY OF SIMCOE.	625.52	625.83
			
DCLXII.	Chisel line in end of copper plug driven horizontally into end of fourth altar step, below coping, on retaining wall on east corner of large triple arch culvert under G.T.R. spanning Coates creek, 300 yards southeast of G.T.R. station. NEW LOWELL.	655.41	655.73
			

7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
DCLXIV.	Chisel line in end of copper plug driven horizontally into stone east face of fifth altar step below coping, south-east wall, south-west of track of arched stone culvert under G.T.R. 237 feet south-east of mile post 85 from Toronto and on lot 23, con. II, township of Nottawasaga	700.05	700.40
	COUNTY OF SIMCOE.		



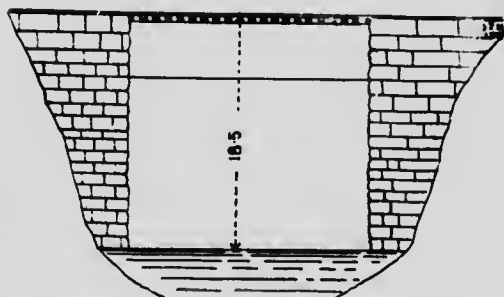
DCLXVI.

Chisel line in end of copper plug driven horizontally into stone in top course of west side of south abutment of G.T.R. bridge over Batteaux river, on lot 35, con. VI, township of Nottawasaga

685.62

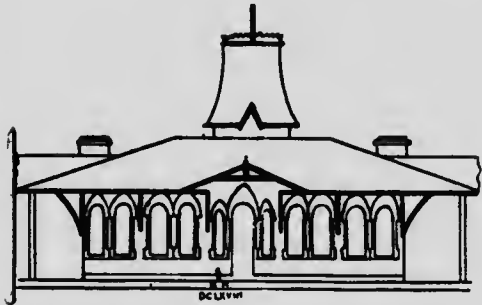
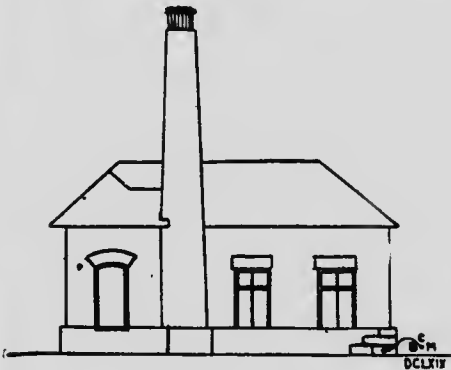
686.00

COUNTY OF SIMCOE.



SESSIONAL PAPER No. 19a

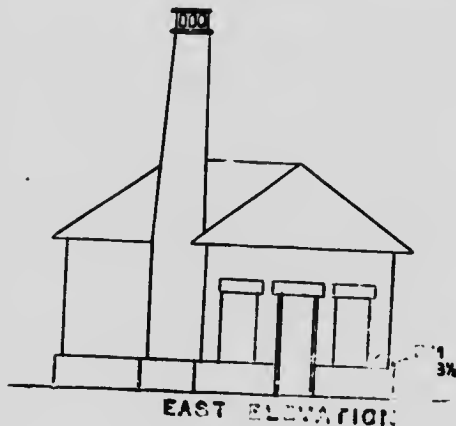
DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
DCLXVIII.	Chisel line in end of copper plug driven horizontally into stone foundation under window, just south of main entrance of G.T.R. station..... COLLINGWOOD.	590.55	590.95
			
DCLXIX.	Chisel line in end of copper plug driven horizontally into stone in first course above ground, south wall of east wing of pumping house of Collingwood S.L. & Building Co..... COLLINGWOOD.	584.70	585.19
			

7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—*Continued.*

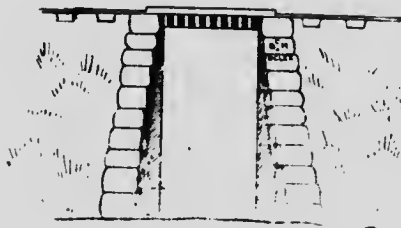
Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
6683	Top of iron spike, driven vertically into top of plinth, north-east corner of Collingwood Ship Building Co.'s pumping house. COLLINGWOOD	587.40	587.80



DE LXX. Chisel line in end of copper plug driven horizontally into end of second altar step from top, south end of east wall of stone culvert under G.T.R., 300 feet east of mile post 65, and about 1 mile east of

BARRIS.

732.57 732.83

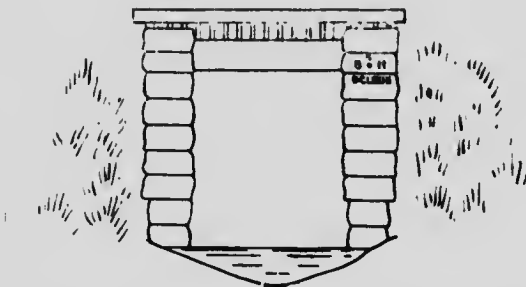


SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCLXXIII.	Chisel line in end of copper plug driven horizontally into end of second culvert from top, south end of east wall of open stone culvert under C. P. R., 1700 feet east of mile post 18.10. To center and on lot 2 regular line of con. 11 township of Ont.	789.41	789.68

COUNTY OF SIMCOE



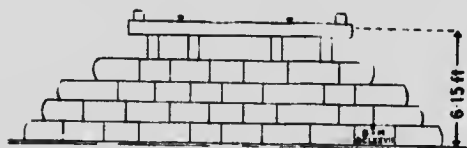
DCLXXVII.

Chisel line in end of copper plug driven horizontally into stone in bottom center, west or inner face, near south end of east abutment of small open stone culvert under C. P. R., 1.12 miles east of Oro station, and on lot 24, con. IX, township of Ont.

796.24

796.54

COUNTY OF SIMCOE.



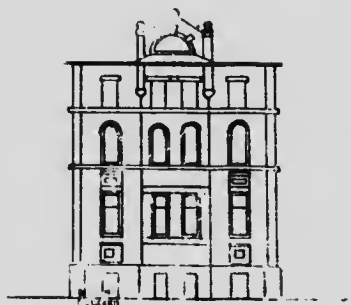
DCLXXXII.

Chisel line in end of copper plug driven horizontally into stone foundation 1 1/2 feet from west corner, front or south face of west wing on south side of

785.68

786.02

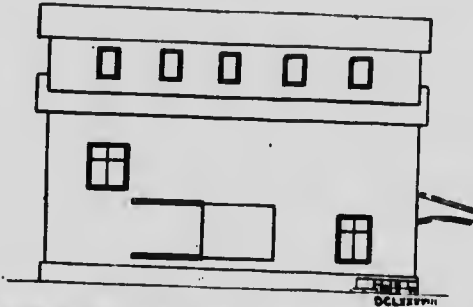
CHURCH AND ASYLUM



SOUTH ELEVATION OF WESTERN WALL

7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
DCLXXXVIII.	Chisel line in end of copper plug driven horizontally into east side face 3.15 feet from north end of foundation of grist mill and elevator of Geo. Vicks and Sons at foot of Tecumseh street .. ORILLIA.	731.05	731.40
			
DCLXXXIX.	Chisel line in end of copper plug driven horizontally into side of solid rock 6.7 feet north-east of G.T.R. rail, 2,105 feet north-west of mile post 138-26 and on lot 7, con. IV, township of North Orillia..... COUNTY OF SIMCOE.	686.96	687.35
			
DCXCIII.	Chisel line in end of copper plug driven horizontally into side of rock on G.T.R. right of way, 8.9 feet north-east of track and 1,925 feet east of mile post 145-19 and on lot 20, con. XIV, township of Medonte..... COUNTY OF SIMCOE.	632.93	633.35
			

SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.

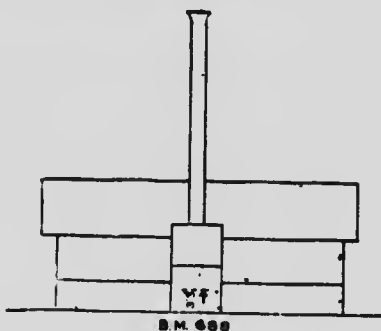
688

Crow foot 3.3 ft. above ground, west face of stone foundation of chimney of James Carter's large saw mill.....

580.27

586.71

FERBERTON.



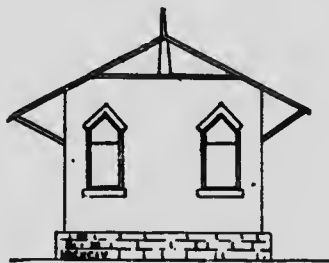
XCIV.

Chisel line in end of copper plug driven horizontally into stone foundation 2½ feet above ground and 1 foot from north-east corner north end of G.T.R. station.....

593.65

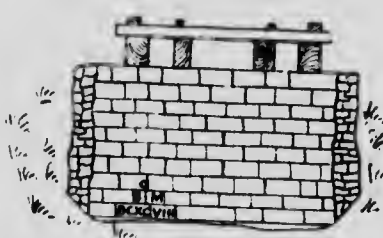
594.09

WAUBAUCHENE.



7-8 EDWARD VII., A. 1908

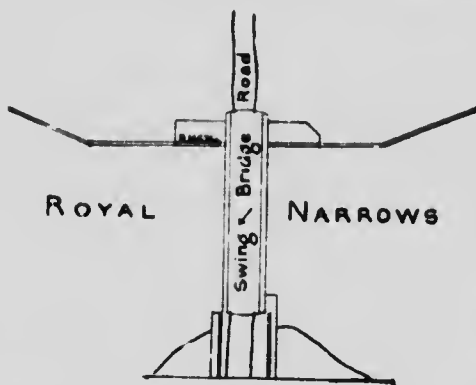
DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCXCVII.	Chisel line in end of copper plug driven horizontally into stone foundation 1.0 feet from north-east corner, front of Victoria Harbour Lumber Co.'s power house at VICTORIA HARBOUR.	580.24	580.73
			
DCXCVIII.	Chisel line in end of copper plug driven horizontally into stone in second course above ground south end of east face of west abutment of C.T.R. bridge over Hog river, west of VICTORIA HARBOUR.	587.13	587.63
			
DCC.	Chisel line in end of copper plug driven horizontally into stone foundation 1.2 feet above granite pavement under space between 4th and 5th first floor windows from front, north wall (south side of Bay street) of Queen's hotel MIDLAND.	597.01	598.50
			

SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

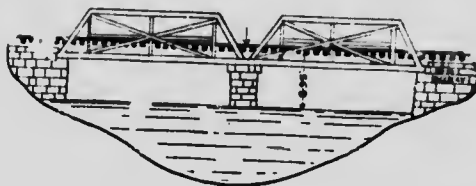
Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
671	Cross cut in top of south-west corner of concrete pier immediately north of turn-table of iron road bridge over Royal Narrows VICTORIA JUNCTION.	721.91	721.26



DC.LXXXVII.	Chisel line in end of copper plug driven horizontally into north end of base of west face of solid rock 60 feet west of main track and opposite mile post 94.133.....	720.05	720.00
	LONGTOWN.		

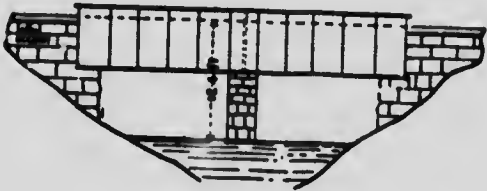
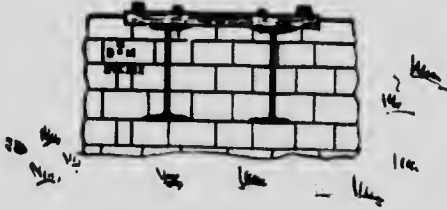
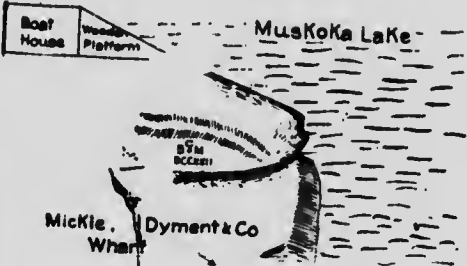


DC.CXXV.	Chisel line in end of copper plug driven horizontally into stone in second course from top, east face of north abutment of G.T.R. bridge over east branch of Severn river south of.....	724.09	724.42
	WASHING.		



7-8 EDWARD VII., A. 1903

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjust. L.
DCCXXIII.	Chisel line in end of copper plug driven horizontally into west face, top stone west end of north abutment of G.T.R. bridge over west branch of Severn river, on lot 10, con. XV, township of North Orillia..... COUNTY OF SIMCOE.	729.15	729.47
			
DCCXXIV.	Chisel line in end of copper plug driven horizontally into second course from top, south face of north abutment west side of track of G.T.R. bridge over Kashabagamog river, lot 21, con. VI., township of MORRISON.	715.74	716.05
			
DCCXXV.	Top of copper plug driven perpendicularly into solid rock at Mickie Dyment & Co.'s wharf, some 225 feet (over the water) west of end G.T.R. Muskoka wharf..... GRAVENHURST.	746.03	746.32
			

SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.

DCCVI.

Chisel line in end of copper plug driven horizontally into 3rd course from top, north face of east end of south abutment of G.T.R. bridge over south branch of Muskoka river, on lot 2, con. XIII, township of Draper.

797.02 797.29

DRAPER.

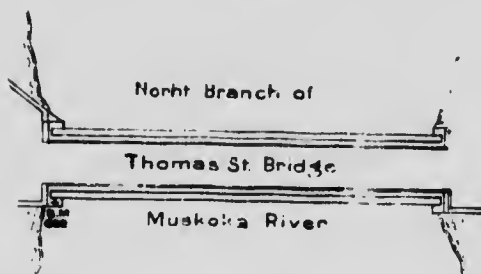


692

Cross cut on coping of seat, south side of west abutment of steel bridge over Muskoka river (87 feet east of track) at foot of Thomas street.

807.78 808.05

BRACKENRIDGE.

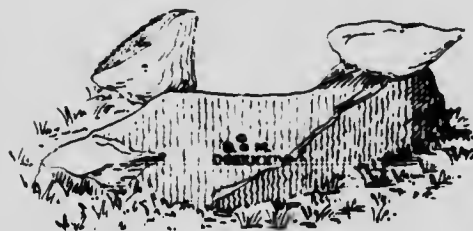


DCCXXXIV.

Chisel line in end of copper plug driven horizontally into west face of solid rock 8.7 feet east of track and 140 feet north of centre of crossing at station of

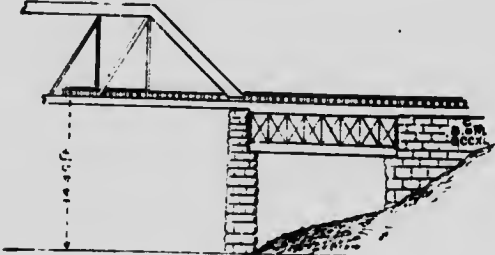
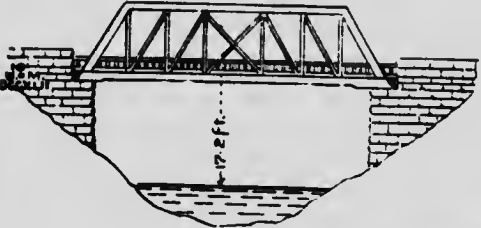
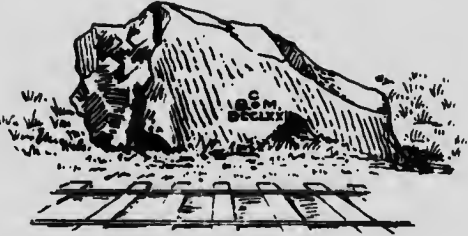
1,037.57 1,037.80

UTTERSON.

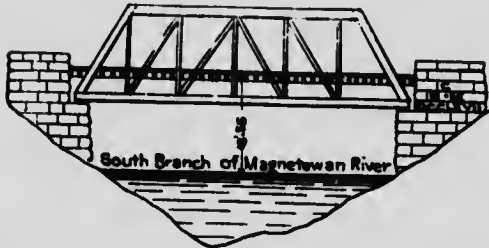
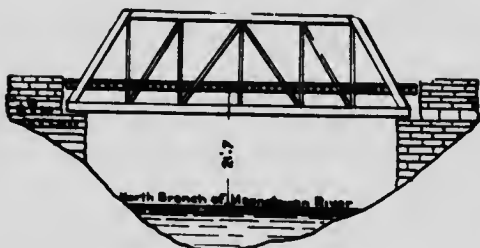
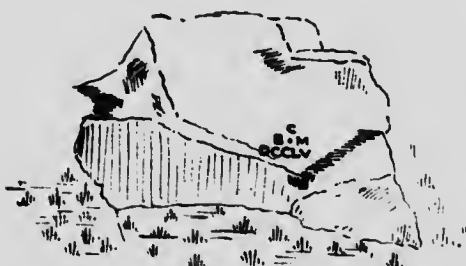


7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCCXL.	Chisel line in end of copper plug driven horizontally into 2nd course from top, south end of west side of south abutment of G.T.R. bridge over Narrows, between Lakes Vernon and Fairy, at HUNTSVILLE. 	964.71	964.92
DCCXLII.	Chisel line in end of copper plug driven horizontally into 4th course from top, south end, east side of south abutment of G.T.R. bridge over Big East river, township of..... CHAFFET. 	954.10	954.30
DCCLXXI.	Chisel line in end of copper plug driven horizontally in solid rock 6.8 feet east of track, 155 feet north of semaphore and 65 feet north of crossing..... SCOTIA JUNCTION. 	1,082.82	1,082.99

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
DCCXLVII.	Chisel line in end of copper plug driven horizontally in 4th course from top, east face of north abutment of G.T.R. bridge over south branch of Magnetewan river..... KATRINE.	981.23	981.39
			
DCCXLII.	Chisel line in end of copper plug driven horizontally in 6th course from top, north end of west face of north abutment of G.T.R. bridge over Magnetewan river..... BURK'S FALLS.	978.57	978.71
			
DCCLV	Chisel line in end of copper plug, driven horizontally in east face of solid rock, 18' 2 feet west of track and 435 feet north of mile post, 46-181..... SUNDRIDGE.	1,094.57	1,094.69
			

7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

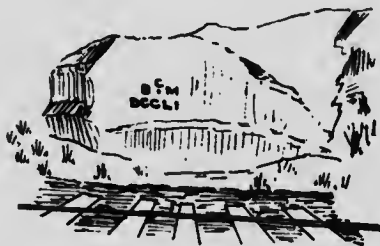
Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.

DCCLI

Chisel line in end of copper plug, driven horizontally in solid rock,
8.25 feet west of track, 189 feet north of first semaphore
north of station at.....

1,156.75 1,156.85

SOUTH RIVER.

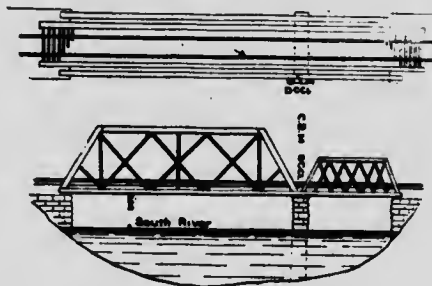


DCCL

Chisel line in end of copper plug, driven perpendicularly into north
end of coping seat, east side of north abutment of G.T.R.
bridge over South river.....

1,152.95 1,153.05

SOUTH RIVER.

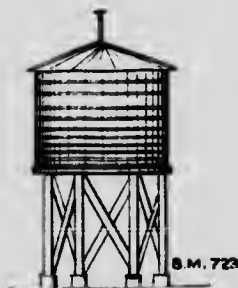


723

Cross cut in southwest corner of steel covering of cement base
first pillar from south front of watertank, 9.2 feet east
track, and 50.4 feet northeast of mile post 100—27

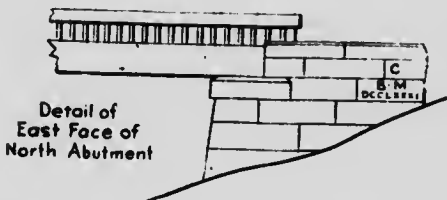
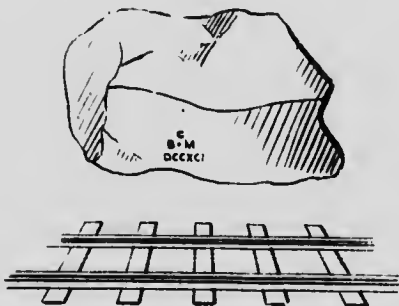
1,027.30 1,027.37

TROUT CREEK.



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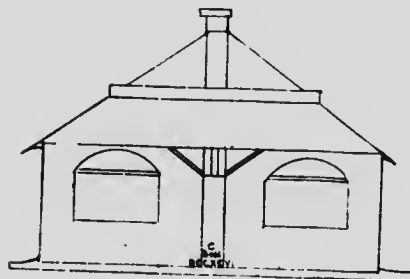
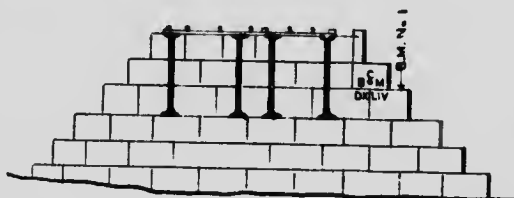
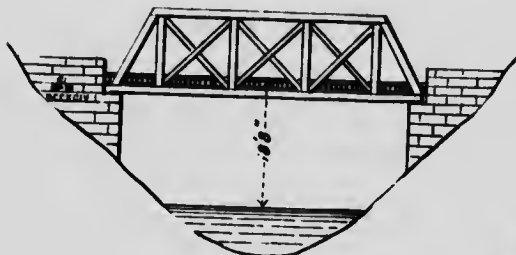
DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
DCCLXXXI	Chisel line in end of copper plug, driven horizontally in third course from top, east face of south abutment of G.T.R. bridge, over McGuines brook..... POWARRAN.	852.21	852.26
			
DCCLXXXVIII	Chisel line in end of copper plug, driven horizontally in fourth course from top, east face of south abutment of G.T.R. bridge over Wistawasing brook..... POWARRAN.	739.51	739.54
			
DCCXCI	Chisel line in end of copper plug, driven horizontally in solid rock, 8'95 feet west of track, and 129 feet northwest of semaphore south of station of..... CALLENDER.	675.88	675.90
			

7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
DCCXCIV	Chisel line in end of copper plug, driven horizontally in third course from top, east face of south abutment of G. T. R. bridge over Rivière à la Vase. NIPISING JUNCTION.	673.10	673.17
DXTIV	Chisel line in end of copper plug, driven horizontally in second course from top, west end of south abutment of bridge over Chippewa creek. Inside edge of coping of fourth altar step, west end of south abutment of bridge over Chippewa creek. NORTH BAY.	650.71	650.71
		646.66	646.06
DCCXCVI	Chisel line in end of copper plug, driven horizontally in cut stone on east face of station at. NORTH BAY.	663.19	663.19



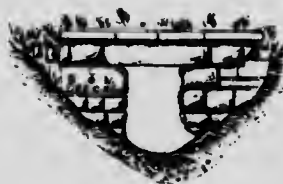
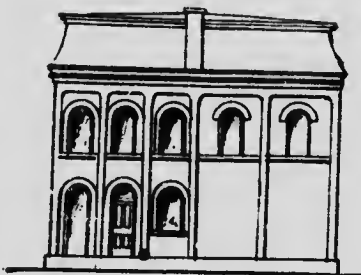
ROUSES' POINT TO MONTREAL.

VIA LACOLLE JC., HOWICK JC., VALLEYFIELD, COTEAU JC. AND LACHINE.

DESCRIPTIVE LIST OF MOST IMPORTANT PERMANENT BENCH MARKS.

Datum: Mean Sea Level, Atlantic Ocean at New York.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
B. M. +	+ Top of stone plinth, 20.6 feet from northeast corner, 1½ feet above ground, north end of the Chapman building, occupied by Wallace & Rosemyer..... ROUSES' POINT, N. Y.	107.96	107.96
DCCCXX	Copper plug, driven horizontally into third course from top east end of north face of small culvert north side of track LACOLLE, P. Q.	161.84	1



7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—*Continued.*

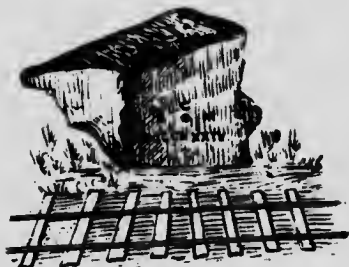
Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
DCCCXXVII	Copper plug driven horizontally into second course from top, west end of north face of small culvert, 480 feet west of mile post 17 HENRYSHURD, P. Q.	223.53	223.01



DCCCXXXII	Copper plug driven horizontally into centre of top stone, south face of small culvert, south side of track and 162 feet west of mile post 22 JOHNSON'S, P. Q.	179.84	179.95
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DCCCXXXIV	Copper plug driven horizontally into solid rock, 9 feet south of track and 81 feet west of mile post 26 HOLTON, P. Q.	195.08	195.21
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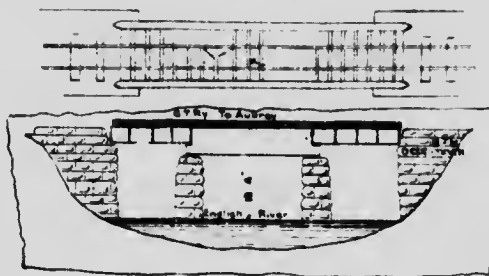


SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks--Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCCCXXXVIII	Copper plug driven horizontally into second course from top, south face of east abutment of G.T.R. bridge over Norton brook	138.00	138.16

AUBREY, P. Q.



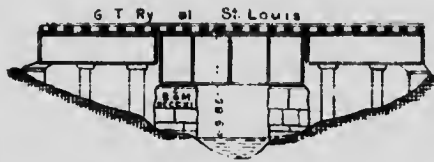
DCCCXIV	Copper plug driven horizontally into third course from top, west face of north end of west abutment of G.T.R. bridge over Chateauguay river	129.25	129.45
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St. Louis, P. Q.



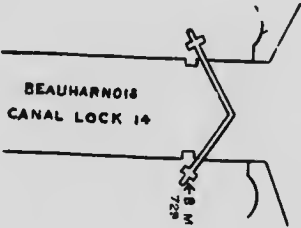
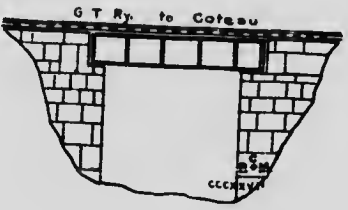
DCCCXI	Copper plug driven horizontally into first course from top, north face of north pier east end of G.T.R. bridge over St. Louis river	129.08	129.31
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St. Louis, P. Q.



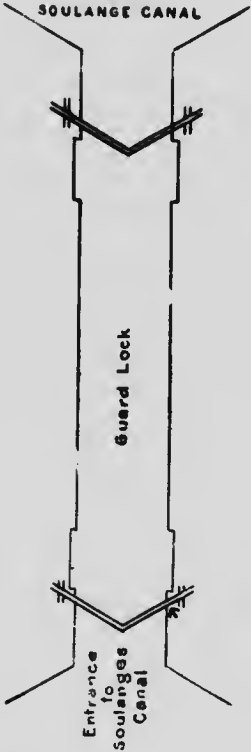
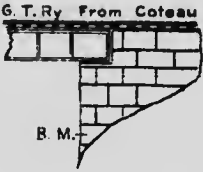
7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCCCVIII	Copper plug driven horizontally into base course, centre of south face of sluice portal, north side of Beauharnois canal, 1½ miles east of lock 14..... VALLEYFIELD P. Q. 	143.44	143.71
729	+ Cross cut on strap 6 inches from heel post, north side of upper gates of lock 14 of Beauharnois canal..... VALLEYFIELD P. Q. 	154.29	154.57
CCCCXXVIII	Copper plug driven horizontally into base of east face of north abutment of overhead crossing of road along north side of canal SOULANGES, P. Q. 	160.85	161.17

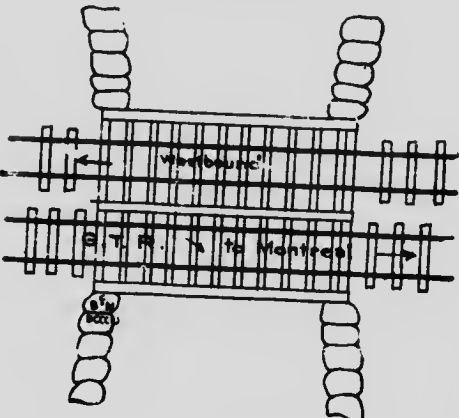
SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS	
		Instrumental.	Adjusted.
S. W. coping.	Coping 6 inches from heel post south end of upper gates of lock 1, Soulanges canal..... SOULANGES, P. Q. 	157.99	158.30
247	Iron bolt driven horizontally into southwest corner of north face of south abutment of G. T. R. overhead crossing of road along south side of Soulanges canal..... SOULANGES P. Q. 	160.99	161.30

7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCCCLXIV	Copper plug driven horizontally into top course, west face of down stream end of east abutment of G.T.R. bridge over Delisle river..... COTEAU P. Q.	158.83	159.14
			
DCCCLXIII	Copper plug driven horizontally into second course from top centre of up stream face of west abutment of G.T.R. bridge over Riviere Rouge RIVIERE ROUGE, P. Q.	157.74	158.05
			
DCCCLX.	Copper plug driven horizontally into lower stone of south face of first stair step of west ballast wall of beam culvert, 784 feet west of mile post 31½ from Montreal ST. DOMINIQUE, P. Q.	149.59	149.91
			

SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCCLIX	Copper plug driven horizontally into third course from top, west end of north face of G. T. R. culvert, 193 feet east of mile post, 20½ miles from Montreal. CEDARS, P. Q.	118.77	119.10



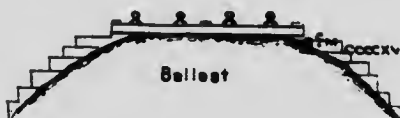
CCCCXV.

Copper plug driven horizontally into west face of top course, south end of west abutment of G. T. R. bridge over Ottawa river.

88.30

88.61

VANDREUIL, P. Q.



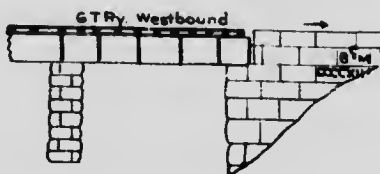
CCCCXIII

Copper plug driven horizontally into second course from top, west end of north face of west abutment of G. T. R. bridge over channel east end of Ile Perrot.

92.01

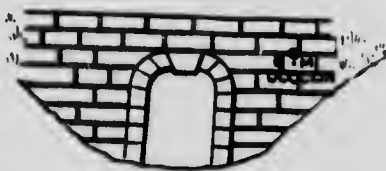
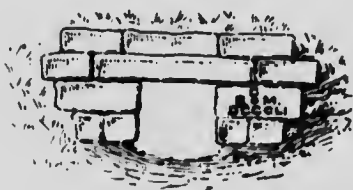
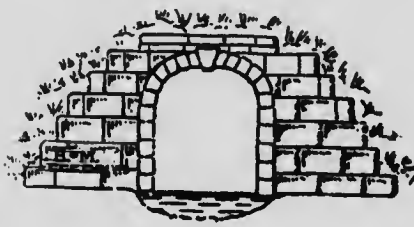
92.65

ILE PERROT, P. Q.



7-8 EDWARD VII., A. 1908

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- mental.	Adjusted.
DCCCLIII.	Copper plug driven horizontally into third course from top, east end of south face of C. P. R. arched culvert, opposite G. T. R. milepost 17. BEAUREPAIRE, P. Q.	83.66	83.98
			
DCCCLI.	Copper plug driven horizontally into third course from top, east end of north face of G. T. R. culvert 745 feet south of mile post 15. BEAconsfield, P. Q.	96.62	96.93
			
C'CCCI.	Copper plug driven horizontally into second course from bottom, south end of west ballast wall of arched culvert, south side of G. T. R., and 220 feet west of Valois station. VALois, P. Q.	73.86	71.16
			

SESSIONAL PAPER No. 19a

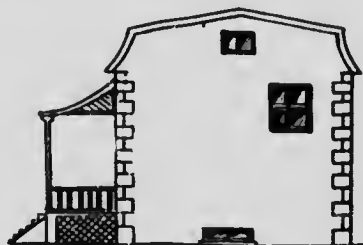
DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
CCCXCVIII.	Copper plug driven horizontally into first cut stone above ground, one foot from rear end of west face of Dorval R. C. church. DORVAL, P. Q.	93.55	93.85



CCCXCVI.	Copper plug driven horizontally into first cut stone above ground, southeast corner of double stone house, second west of 34th avenue, along Lachine road.....	79.20	79.49
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LACHINE WHARF, P. Q.



7-8 EDWARD VII., A. 1908

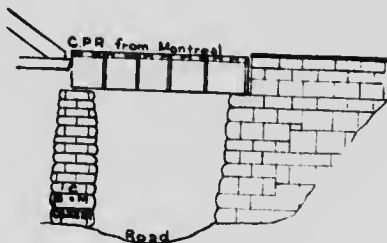
DESCRIPTIVE List of most Important Permanent Bench Marks—*Continued.*

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instru- Instru-	Adjusted.

- DLXXXI. Copper plug driven horizontally into second course above ground, west face of pier, 15 feet, south of south side of Lachine canal (C.P.R. swing bridge).....

74.53 74.81

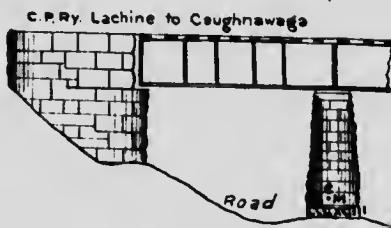
LACHINE, P. Q.



- CCCXIII. Copper plug driven horizontally into second course above ground, southwest face of first pier, Lachine end of C.P.R. bridge over St. Lawrence river.....

93.85 94.13

LACHINE, P. Q.



- DCCCXLV. Copper plug driven horizontally into stone foundation 18 inches from front, south gable of John Huffy's brick cottage, 18' 7 feet north of track, east side of St. Philippe street.....

63.86 64.12

ST. HENRI, P. Q.

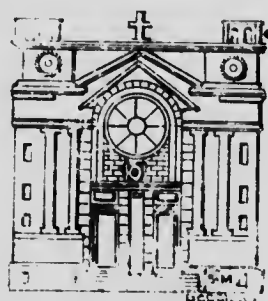


SESSIONAL PAPER No. 19a

DESCRIPTIVE List of most Important Permanent Bench Marks—Continued.

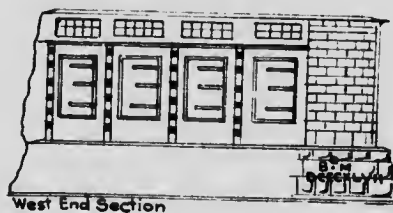
Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCCCXLVI.	Copper plug driven horizontally into second course above ground, 14.85 feet from east end of stone front of St. Omégonde R. C. church.	53.54	53.80

MONTREAL, P. Q.



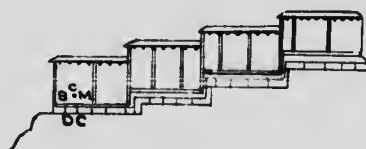
DCCCXLVII	Copper plug driven horizontally into second course above ground, 6.6 feet from west end of north face of G. T. R. freight shed nearest to tracks, at Mountain street crossing.	46.69	46.95
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MONTREAL, P. Q.



DC.	Copper plug driven horizontally into base, south face of west end of guard wall, south abutment of Curran bridge over Lachine canal at Wellington street	54.66	54.00
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MONTREAL, P. Q.



PRECISE LEVELLING.

ROUSES' POINT TO CORNWALL VIA ST. JOHN, VICTORIA BRIDGE,
LACHINE, VAUDREUIL AND COTEAU LANDING.COMPLETE LIST OF BENCH MARKS AND ELEVATIONS, DATUM, MEAN SEA LEVEL, ATLANTIC
OCEAN AT NEW YORK.

Bench Marks.	Description and Location.	ELEVATIONS.	
		Instrumental.	Adjusted.
+	20.6 feet from N.E. corner of Chapman building, Rouses' Point, New York.....		
	Base of rail, D. & H. Ry., at Chapman St. crossing, Rouses' Point.....	107.96	107.96
	Base of rail, D. & H. Ry., Pratt St.....	129.25	129.25
	Base of rail, D. & H. Ry., Rouses' Point station.....	123.15	123.15
DCI.	On N.E. corner of D. & H. Ry. station, Rouses' Point.....	122.48	122.48
639	Base of rail, D. & H. Ry., at crossing of Rutland Ry.....	123.75	123.76
	+ On boulder at boundary line, U.S.A. and Canada.....	120.31	120.31
	Base of D. & H. Ry., rail at boundary line, U.S.A. and Canada.....	113.39	113.41
	Top of bronze cap of bench wall 'A' in boundary line.....	116.37	116.39
	Cavity in bronze cap of bench wall 'A' in boundary line.....	93.60	93.63
	Top of inside tube of bench wall 'A' in boundary line.....	93.56	93.59
	Top of outside tube of bench wall 'A' in boundary line.....	101.55	101.59
DCII.	In W. face of S. abutment of G.T.R. culvert, Lacolle, P.Q.....	102.68	102.72
	Base of G.T.R. rail, centre of G.T.R. culvert, Lacolle.....	109.28	109.31
	Base of G.T.R. rail at road crossing, Lacolle.....	113.57	113.59
	Base of G.T.R. rail at crossing of branch to Ottawa.....	117.33	117.35
	Base of G.T.R. rail at road crossing, Lacolle, P.Q.....	130.42	130.45
	Base of G.T.R. rail at old G.T.R. station, Lacolle, P.Q.....	131.12	131.15
	Base of G.T.R. rail, centre of bridge, over Lacolle river.....	131.99	132.02
DCIII.	On W. end of N. abutment of bridge over Lacolle river.....	131.84	131.87
640	+ On W. end of N. abutment of bridge over Lacolle river.....	129.92	129.95
641	+ On W. end of N. abutment of bridge over Lacolle river.....	132.17	132.20
	Base of G.T.R. rail, at road crossing, Lacolle, P.Q.....	132.06	132.09
	Base of G.T.R. rail, at road crossing, Lacolle, P.Q.....	134.64	134.67
DCIV.	Base of G.T.R. rail, at road crossing, Lacolle, P.Q.....	145.88	145.92
	On E. end of N. abutment of G.T.R. culvert, Lacolle.....	141.07	141.11
	Base of G.T.R. rail, centre of G.T.R. culvert, Lacolle.....	137.06	137.10
IX.	Base of G.T.R. rail at road crossing culvert, Lacolle.....	139.51	139.55
	On N.E. corner of L. Goudreau's house, Lacolle.....	139.26	139.30
	Base of G.T.R. rail, at road crossing, Stottsville, P.Q.....	128.61	128.65
DCV.	Base of G.T.R. rail at St. Valentin de Stottsville station.....	161.74	161.79
DCVI.	On S. side of Stottsville R.C. church.....	150.06	150.12
	On E. end of S. abutment of G.T.R. culvert, Stottsville.....	157.44	157.50
	Base of G.T.R. rail, centre of G.T.R. culvert, Stottsville.....	146.41	146.47
642	+ At S.E. corner of G.T.R. culvert, Stottsville.....	149.85	149.91
VIII.	On S. gable of C. Boudreau's house, St. Paul.....	145.79	145.85
DCVII.	On front of St. Paul de l'Île aux Noix R.C. church.....	105.80	105.87
B.W. 'B.'	Top of bronze cap of bench wall 'B', St. Paul.....	109.54	109.61
B.W. 'B.'	Cavity in bronze cap of bench wall 'B', St. Paul.....	97.04	97.11
B.W. 'B.'	Base of G.T.R. rail at road crossing, Stottsville.....	97.03	97.10
DCXVII.	On S.E. corner of G.T.R. arched culvert, Stottsville.....	158.13	158.19
643	+ On S.E. corner of G.T.R. arched culvert, Stottsville.....	150.41	150.48
	Base of G.T.R. rail at road crossing, Stottsville.....	149.82	149.89
	Base of G.T.R. rail at Girard station.....	160.18	160.25
	Base of G.T.R. rail at Girard station crossing.....	152.20	152.28
644	+ On boulder 24 feet E. of track, opposite Girard's house.....	151.96	152.04
	Base of G.T.R. rail at road crossing.....	149.09	149.17
	Base of G.T.R. rail at Grande Ligne station.....	144.81	144.90
	Base of G.T.R. rail at Grande Ligne crossing.....	141.72	141.81
DCVIII.	On N.W. corner of Grande Ligne station.....	141.58	141.67
DCIX.	On stone front of St. Blaise de Grande Ligne R.C. church.....	141.74	141.83
VI.	On W. gable of M. Robert's house foot of Grande Ligne road.....	141.69	141.78
V.	On N. wall of Lucien Menard's house, St. Johns.....	107.58	107.68
IV.	On N. gable of F. Pinsonnault's house, St. Johns.....	117.81	117.93
DCX.	On N.E. corner of G.T.R. culvert, St. Johns.....	110.76	110.89
	Base of G.T.R. rail, centre of culvert, St. Johns.....	119.28	119.40
		124.58	124.70

7-8 EDWARD VII., A. 1908

ROUSES' Point to Cornwall, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCXI.	On S.W. corner of G.T.R. culvert, St. Johns.	104.66	104.78
	Base of G.T.R. rail, centre of culvert, St. Johns.	107.57	107.69
DCXII.	Base of G.T.R. rail at road crossing, St. Johns.	105.11	105.23
B.W. 'C.'	On S. base of G.T.R. tank, St. Johns.	123.73	123.85
	Top of bronze cap of bench wall 'C', St. Johns.	101.76	101.89
	Cavity in bronze cap of bench wall 'C', St. Johns.	101.74	101.87
	Base of G.T.R. rail, W. side of St. Johns station.	120.63	120.75
	Base of G.T.R. rail, E. side of St. Johns station.	120.20	120.32
III.	On S. gable of Montgomery's house, St. Johns.	116.80	116.92
DCXVII.	On W. curved wall of lock 1, St. Johns.	96.45	96.50
I.	On N.E. corner of T. Nolin's house, St. Johns.	106.27	106.41
633	+ On granite pavement, N.W. end of G.T.R. station.	121.57	121.69
	Base of G.T.R. rail, crossing of St. John street.	117.38	117.51
	Base of G.T.R. rail, crossing of Bernier St.	110.48	110.61
	Base of G.T.R. rail at St. Johns station.	116.36	116.50
	Base of G.T.R. rail at C.P.R. crossing, St. Johns.	113.97	114.10
DCXVI.	Base of G.T.R. rail, centre of culvert 423 feet N. of mile 26.	114.63	114.76
	On E. end of S. wall, culvert 423 feet N. of mile 26.	107.37	107.50
	Base of rail crossing 400 feet N. of mile 24.	131.00	132.04
DCXV.	Base of rail, centre of culvert 575 feet N. of mile 22.	126.73	126.88
	On S. end of N. abutment, culvert 575 feet N. of mile 22.	120.67	120.82
	Base of rail crossing 625 feet N. of mile 22.	126.80	126.95
	Base of rail, centre of culvert 575 feet S. of mile 21.	123.23	123.38
DCXIV.	On W. end of N. wall of culvert 565 feet S. of mile 21.	118.38	118.53
	Base of G.T.R. rail, Lacadie station.	116.87	117.03
	Base of G.T.R. rail, Lacadie station crossing.	116.76	116.92
	Base of G.T.R. rail, centre of bridge over Lacadie river.	116.17	116.33
DCXIII.	On W. end of N. abutment, bridge over Lacadie river.	110.37	110.53
	Base of G.T.R. rail, crossing 445 feet S. of mile 19.	120.22	120.38
	Base of G.T.R. rail, culvert 280 feet N. of mile 17.	109.10	109.27
DCXII.	On E. end of S. wall, culvert 280 feet N. of mile 17.	104.13	104.30
	Base of rail crossing 850 feet N. of mile 17.	94.10	94.27
	Base of rail crossing 1,000 feet N. of mile 16.	77.03	77.21
	Base of rail, centre of culvert 875 feet S. of mile 14.	54.26	54.45
DCXI.	On E. end of S. wall, culvert 875 feet S. of mile 14.	49.38	49.57
DXC.	Base of G.T.R. rail, centre of culvert 216 feet N. of mile 13.	51.19	51.38
	On W. end of N. abutment of culvert 216 feet N. of mile 13.	44.29	44.48
	Base of rail, centre of culvert 1,570 feet N. of mile 13.	51.48	51.68
DLXXXIX.	On E. abutment of culvert 1,570 feet N. of mile 13.	48.82	49.02
	Base of G.T.R. rail, at crossing 1,335 feet S. of mile 12.	53.11	53.31
	Base of G.T.R. rail at Brosseau station.	50.05	50.25
	Base of G.T.R. rail at crossing 1,320 feet E. of mile 11.	60.41	60.61
DLXXXVIII.	Base of G.T.R. rail opposite B.M. DLXXXVIII, Brosseau.	62.29	62.50
	On E. end of S. wall of culvert 1,125 feet N. of mile 10.	58.15	58.36
DLXXXVII.	Base of G.T.R. rail opposite B.M. DLXXXVII.	61.75	61.96
	On W. end of S. wall of culvert 270 feet S. of mile 9.	58.36	58.57
	Base of G.T.R. rail, opposite B.M. 632, St. Lambert.	62.17	62.39
632	+ On boulder 17 feet W. of track, 100 feet N. of mile 8.	61.22	61.44
DLXXXVI.	Base of G.T.R. rail, centre of crossing Victoria St.	60.20	60.43
	On W. abutment of G.T.R. crossing of Victoria street.	71.06	72.19
	Base of G.T.R. rail at St. Lambert station.	73.95	74.18
	Base of G.T.R. rail, centre of overhead crossing, Laprairie Rd.	66.12	66.35
CXLI.	On W. wall of subway under G.T.R., Laprairie Rd.	49.38	49.61
631	+ On stone base of steel arch, St. Lambert end, Victoria bridge.	68.38	68.61
DLXXXV.	On stone base of steel arch, St. Lambert end, Victoria bridge.	67.55	67.78
630	On S. stone, first steel arch, entrance to Victoria bridge.	67.97	68.21
I.	On S. end of E. face of Longueuil ferry subway.	37.76	38.02
M.	On S. end of E. face of Beaudry St. subway.	41.27	41.52
N.	On S.E. corner of Montreal Custom House.	49.03	49.28
O.	On front of Montreal Examining Warehouse.	48.98	49.23
637	+ On coping E. side of old lock, Lachine Canal.	36.94	37.19
636	+ On coping E. side of new lock, Lachine Canal.	36.46	36.71
635	+ On coping S. side of Windmill Pt. basin.	41.97	42.22
DLXXXIV.	+ On coping S. side of Windmill Pt. basin.	42.00	42.25
	On S. stone, first steel arch, entrance to Victoria bridge.	67.18	67.42
	Base of G.T.R. rail at Pt. St. Charles station, Montreal.	52.54	52.79
	Base of G.T.R. rail at Herbernia St. crossing, Montreal.	49.85	50.10
	Base of G.T.R. rail at Charlevoix St. crossing, Montreal.	51.70	52.01
	Floor level, centre of Curran bridge, Montreal.	55.88	56.14
DC.	On W. end of S. abutment of Curran bridge, Montreal.	54.63	54.90
634	+ On E. end of S. coping of lock 3, Montreal.	58.61	58.87
DCXIX.	On E. end of S. abutment of St. Gabriel bridge, Montreal.	63.51	63.76
	Floor level of St. Gabriel St. bridge over canal, Montreal.	63.58	63.84
DCXVIII.	On S. abutment of Brewster bridge over canal, Montreal.	61.21	61.49
	Floor level of Brewster bridge over canal, Montreal.	65.07	65.32
DLXXXIII.	On W. side of G.T.R. bridge over canal, Montreal.	61.47	61.72
629	+ On lower end of S. coping of lock 4, Montreal.	67.58	67.84
DLXXXII.	On guard wall S. end of Cote St. Paul bridge, Montreal.	72.74	73.00
628	+ On guard wall S. end of Cote St. Paul bridge, Montreal.	72.08	72.31

SESSIONAL PAPER No. 19a

ROUSES' Point to Cornwall, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental	Adjusted.
627	Road level S. end of Cote St. Paul bridge Montreal.	70.76	72.02
626	+ On boulevard S. side of Lachine canal, Montreal.	69.78	70.04
625	+ On boulevard S. side of Lachine canal, Montreal.	71.23	71.50
DLXXXI.	On W. side of S. pier of C.P.R. bridge over canal, Lachine.	71.24	71.50
	Base of C.P.R. rail at Highway 13 station, Lachine.	71.53	71.81
CCCXCIII.	Base of C.P.R. rail at overhead crossing, Lachine.	115.90	116.11
	On W. side of first pier of C.P.R. bridge at Lachine.	121.92	122.18
535	Lower Lachine road level opposite tollgate.	93.55	91.13
536	On coping of new lock 5, Lachine, P.Q.	75.37	75.62
CCCXCIV.	On coping of old lock 5, Lachine, P.Q.	71.42	71.71
CCCXCV.	On E. end of stone front of R.C. church, Lachine, P.Q.	71.15	71.42
	On W. side of post office, Lachine, P.Q.	82.87	83.16
536j	Base of G.T.R. rail at Lachine wharf station.	76.29	76.58
	Brass headed nail on Lachine wharf.	71.53	71.82
536j	Base of G.T.R. rail at Lachine station.	72.04	72.33
	S.W. corner of G.T.R. culvert.	80.40	80.59
CCCXCVI.	Base of G.T.R. rail, centre of culvert, Lachine, P.Q.	83.77	83.77
CCCXCVII.	On S.E. corner of McLean's double house, Lachine, P.Q.	80.08	80.38
537	On N.W. corner of Fulton's brick house, Lachine, P.Q.	79.18	79.19
CCCXCVIII.	On east corner of W. face of avenue to Dorval R.C. church.	76.07	76.07
538	On rear corner of W. face of Dorval R.C. church.	82.03	82.34
CCCXCIX.	Brass headed nail on road of elm tree opposite Houde's house.	93.54	93.85
1100	On W. face of A. G. Legault's resi. fence, Dorval.	83.40	83.71
	On W. face of Leon Denis' resi. fence, Dorval.	83.56	83.87
	Base of C.P.R. rail at Valois station crossing.	82.38	82.70
	Base of G.T.R. rail at Valois station crossing.	80.10	80.12
CCCCI.	On S. face of G.T.R. arch culvert, Valois, P.Q.	80.13	80.15
CCCCII.	On S.E. corner of T. Legault's house, Pte. Claire.	73.82	74.16
539	Brass headed nail on Pte. Claire wharf.	80.61	80.94
CCCCIII.	On S.E. corner of Pte. Claire R.C. church.	75.82	76.15
CCCCIV.	On S.E. corner of priest's resi. fence, Pte. Claire.	83.95	84.28
CCCCV.	On W. face of Alfred Dagenais' residence, Pte. Claire.	83.80	84.13
CCCCVI.	On S.E. face of John Angeli's residence, Pte. Claire.	82.07	82.41
CCCCVII.	On E. face of Judge Ouhet's residence, Ste. Anne de Bellevue.	84.79	85.14
CCCCVIII.	On W. face of H. Lanctot's house, Ste. Anne de Bellevue.	88.78	89.14
	Base of G.T.R. rail at Ste. Anne de Bellevue station.	79.61	80.28
	Base of C.P.R. rail at Ste. Anne de Bellevue station.	121.19	121.54
	Peak of E. abutment of C.P.R. bridge over Ottawa river.	114.07	118.07
CCCCXII.	Base of C.P.R. rail, centre of bridge over Ottawa river.	111.66	112.01
510	Base of G.T.R. rail, centre of bridge over Ottawa river.	111.05	111.43
CCCCXIII.	On coping N.E. corner of G.T.R. bridge over Ottawa river.	110.30	110.68
CCCCXIV.	Brass headed nail, S.E. corner of Lalouche's wharf.	105.19	105.87
CCCCXV.	On E. face of first pier of G.T.R. bridge over Ottawa river.	73.76	74.13
CCCCXVI.	On N.W. face of priest's house, Ste. Anne de Bellevue.	81.85	82.22
CCCCXVII.	On S.W. corner of R.C. church, Ste. Anne de Bellevue.	88.75	89.12
511	On S.W. corner of new lock, Ste. Anne de Bellevue.	86.69	87.06
511j	On S.W. corner of new lock, Ste. Anne de Bellevue.	81.45	81.82
	Upper sill of new lock, Ste. Anne de Bellevue.	81.25	81.82
	Lower sill of new lock, Ste. Anne de Bellevue.	59.57	59.94
	Lower sill of old lock, Ste. Anne de Bellevue.	57.66	58.03
	Brass headed nail on end of pier, Ste. Anne de Bellevue.	60.04	61.03
CCCCXIII.	Base of C.P.R. rail, W. end of bridge over Ottawa river.	77.97	78.34
	On N. face of W. abutment of G.T.R. bridge on the Perrot.	106.19	106.57
	Base of G.T.R. rail, centre of bridge on the Perrot.	91.46	92.33
CCCCXIV.	Base of C.P.R. rail, centre of bridge on the Perrot.	91.70	93.02
	On S. end of E. abutment of G.T.R. bridge at Vaudreuil.	91.89	92.17
	Base of G.T.R. rail, E. end of G.T.R. bridge at Vaudreuil.	93.12	93.51
CCCCXV.	Base of G.T.R. rail, W. end of G.T.R. bridge at Vaudreuil.	91.53	91.92
	On S. end of west abutment of G.T.R. bridge at Vaudreuil.	89.51	89.96
	Base of C.P.R. rail at Vaudreuil station.	88.21	88.61
	Base of G.T.R. rail at Vaudreuil station.	86.07	86.40
CCCCXVI.	Base of G.T.R. rail at Vaudreuil village crossing.	81.76	85.09
	On S.W. corner of Foster's house, rail to Chénouet.	81.54	81.87
	Coping, end of long pier, lower entrance to Soulanges canal.	81.06	85.05
	Coping, end of light house pier, lower entrance to Soulanges canal.	79.52	79.90
CCCCXVII.	On N. face of stairway wall of lock 1, Soulanges canal.	79.41	79.69
	Coping opposite stairway wall of lock 1, Soulanges canal.	80.55	80.93
	Coping opposite lower gates of lock 1, Soulanges canal.	78.51	78.89
CCCCXVIII.	Coping opposite upper gates of lock 1, Soulanges canal.	92.97	93.35
	On N. face of stairway of lock 2, Soulanges canal.	92.90	93.34
	Coping opposite stairway of lock 2, Soulanges canal.	95.37	95.75
	Coping opposite lower gates of lock 2, Soulanges canal.	92.90	93.34
CCCCXIX.	Coping opposite upper gates of lock 2, Soulanges canal.	116.45	116.83
	On N. face of stairway of lock 3, Soulanges canal.	116.10	116.84
	Coping opposite stairway of lock 3, Soulanges canal.	119.76	120.14
	Coping opposite lower gates of lock 3, Soulanges canal.	116.39	116.77
	Coping opposite lower gates of lock 3, Soulanges canal.	139.93	140.31

7-8 EDWARD VII., A. 1908

ROUSES' Point to Cornwall, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
CCCCXX.	Coping opposite upper gates of lock 3, Soulanges canal.	130.89	140.27
	On N. face of stone block, lower side of bridge, Soulanges canal.	140.70	141.08
512	Flooring, centre of bridge over Soulanges canal, St. Antoine road.	144.56	144.93
CCCCXXI.	+ On coping, upper end of N. abutment of bridge over canal	141.60	142.06
	On N. face of stairway of lock 4, Soulanges canal.	142.02	142.39
	Coping opposite stairway of lock 4, Soulanges canal.	139.83	140.20
	Coping opposite lower gates of lock 4, Soulanges canal.	157.85	158.22
	Coping opposite upper gates of lock 4, Soulanges canal.	157.80	158.17
CCCCXXII.	Coping opposite upper gates north of lock 4, Soulanges canal.	157.76	158.13
	On E. face of N. abutment of canal bridge at St. Fereol road.	156.86	157.22
CCCCXXIII.	Flooring, centre of Soulanges canal bridge at St. Fereol road.	160.79	161.15
	On N.W. corner of Pedrara R. C. church.	158.39	158.75
CCCCXXIV.	Top step, opposite main entrance to Pedrara R. C. church.	156.78	157.14
	On E. face of N. abutment of canal bridge at St. Dominique road.	156.81	157.16
	Flooring, centre of Soulanges canal bridge at St. Dominique road.	160.77	161.12
543	+ On stone step of building opposite canal electric power house.	158.35	158.70
CCCCXXV.	On E. face of N. abutment of canal bridge at Emmanuel road.	156.53	156.87
	Flooring, centre of Soulanges canal bridge at Emmanuel road.	160.87	161.21
CCCCXXVI.	On E. face of N. abutment of canal bridge at River Rouge road.	157.41	157.75
	Flooring, centre of Soulanges canal bridge at River Rouge road.	161.18	161.52
544	Iron bolt, rear end of Coteau du Lac R.C. church.	156.02	156.35
545	Top step, opposite main entrance to Coteau du Lac church.	157.12	157.45
CCCCXXVII.	On stone front of Coteau du Lac R.C. church.	158.48	158.81
CCCCXXVIII.	On E. face of G.T.R. overhead of road along N. side of canal.	160.85	161.17
546	Iron bolt on W. face of overhead crossing of road N. side of canal.	159.44	159.76
CCCCXXIX.	On stone block, lower end of bridge over canal.	158.76	159.07
547	Iron bolt, W. face of G.T.R. overhead crossing S. of canal.	160.93	161.30
	Base of rail, crossing 3 miles E. of Coteau station.	158.00	159.21
624	On W. coping of S. abutment of highway bridge over Delisle river.	158.40	158.71
DLXXIX.	On W. face of S. abutment of highway bridge over Delisle river.	156.43	156.74
	Base of rail rear of Coteau station.	159.53	159.85
	Base of rail at Coteau station.	159.50	159.82
	Base of rail junction of branch to Ottawa.	159.40	159.72
DLXXVIII.	On S. end of E. abutment bridge 600 feet E. of St. Zotique station.	154.65	154.97
623	Base of rail, N. end of W. abutment bridge 600 feet E. of St. Zotique station.	158.41	158.73
	Base of rail, centre of bridge, 600 feet E. of St. Zotique station.	159.12	159.44
	Base of rail at St. Zotique station crossing.	158.78	159.10
	Base of rail at St. Zotique station.	158.74	159.06
	Base of rail first crossing W. of St. Zotique station.	161.69	162.00
	Base of rail at River Beaudette station.	167.98	168.29
	+ On S. end of E. abutment, bridge over River Beaudette.	169.71	170.02
622	Base of rail, centre of bridge over River Beaudette.	172.41	172.72
DLXXVII.	On S. face of W. abutment, bridge over River Beaudette.	172.14	172.45
	Base of rail at first crossing W. of River Beaudette.	169.45	169.76
	Base of rail at second crossing W. of River Beaudette.	173.78	174.09
	Base of rail centre bridge over Woods creek.	167.51	167.82
DLXXVI.	On S. face of W. abutment, bridge over Woods creek.	165.56	165.86
	Base of G.T.R. rail, third crossing W. of River Beaudette.	162.29	162.59
	Centre of bridge, Sutherland creek.	167.55	167.85
DLXXV.	On W. end of W. abutment of bridge, Sutherland creek.	166.45	166.75
621	W. peak of S. coping of culvert, 800 feet W. of mile 48.	163.05	163.35
	Base of rail, centre of culvert, 800 feet W. of mile 48.	175.23	175.53
DLXXIV.	On S. end of W. wall of culvert, 800 feet W. of mile 48.	175.22	175.52
	Base of G.T.R. rail, opposite B.M. DLXXIII.	169.17	169.47
	Base of G.T.R. rail at Bainsville station.	164.77	165.07
DLXXIII.	On S. end of W. wall of culvert 140 feet E. of mile 50.	173.06	173.36
	Base of rail, centre of culvert, E. of mile 51.	159.27	159.57
DLXXII.	Base of rail, centre of culvert, E. of mile 51.	163.44	163.74
	On W. wall of culvert, 1,075 feet E. of mile 51.	157.17	157.47
	Base of G.T.R. rail, first crossing, E. of Lancaster station.	170.06	170.36
	Base of G.T.R. rail at Main street crossing.	163.74	164.04
	Base of G.T.R. rail, opposite Lancaster station.	163.26	163.56
DLXXI.	On N.E. corner of Lancaster station.	165.85	166.15
621	Top of ditch, course N.W. corner of Lancaster station.	165.29	165.59
DLXX.	Base of rail, first crossing W. of Lancaster station.	161.54	161.84
621	On S. end of W. abutment of bridge over Black river.	162.97	163.27
	+ On E. coping of G.T.R. bridge over Black river.	165.62	165.92
	Base of G.T.R. rail, centre of bridge over Black river.	166.37	166.67
	Base of G.T.R. rail at road crossing, Summerstown.	166.14	166.44
	Base of G.T.R. rail at road crossing, Summerstown.	168.35	168.65
	Base of G.T.R. rail at road crossing, Summerstown.	169.41	169.71

SESSIONAL PAPER No. 19a

Rouses' Point to Cornwall, &c.—Complete List of Bench Marks, &c.—Concluded.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
6214	E. peak, S. coping, W. wall of culvert at mile 57.2.	166.95	170.25
DI.XIX.	Base of rail, centre of culvert, 870 feet W. of mile 57.	169.58	169.88
DI.XVIII.	On S.W. corner of culvert, 870 feet W. of mile 57.	164.97	165.27
	Base of rail, opposite B.M. DI.XVIII.	173.20	173.50
	On E. end of S. wall, culvert 1 050 feet E. of mile 58.	16.72	168.02
621	Base of rail at crossing, Summerstown.	172.71	173.01
	Base of rail at crossing, Summerstown.	176.44	176.74
	+ On boulder, N. of track, 65 feet E. of semaphore.	183.14	183.44
	Base of rail at street crossing.	179.64	179.94
DI.XVII.	Base of rail opposite Summerstown station.	182.71	183.01
	Base of rail opposite B.M. DI.XVII.	180.43	180.73
	On ladder, N. of railway, 1 070 feet W. of mile 59.	180.49	180.79
	Base of rail at road crossing, Summerstown.	184.80	185.10
	Base of rail at road crossing, Summerstown.	176.63	176.93
620	Base of rail, centre of culvert at mile 62.6.	176.11	176.41
DI.XVI.	+ S.W. corner of culvert at mile 62.6.	174.72	175.02
	On W. end of S. face of culvert, opposite mile 63.	177.92	178.22
6194	Base of rail, culvert opposite mile 63.	181.13	181.43
	S.W. coping of G.T.R. culvert, mile 63.	180.83	181.13
	Base of G.T.R. rail, crossing Summerstown.	177.01	177.31
	Base of G.T.R. rail, crossing Summerstown.	173.43	173.73
DI.XV.	Base of rail opposite B.M. DI.XV, Summerstown.	175.01	175.31
DI.XIV.	On S. end of E. wall of culvert 235.4 feet E. of mile 65.	170.92	171.22
	Base of G.T.R. rail, opposite B.M. DI.XIV.	187.95	188.25
	On E. end of S. face of G.T.R. culvert.	181.47	181.77
	Base of G.T.R. rail at Marlborough St. crossing.	191.40	191.70
	Base of G.T.R. rail at Marlborough St. crossing.	180.59	180.89
6194	Base of G.T.R. rail opposite B.M. 6194.	187.62	187.92
	E. peak, S. coping, W. wall of G.T.R. culvert.	187.71	188.01
6193	Base of G.T.R. rail opposite Cornwall station.	192.17	192.47
DI.XII.	On N. face of Cornwall stone station.	194.55	194.85
	On S. face of Cornwall stone station.	194.17	194.47
	Base of G.T.R. rail at Pill St. crossing, Cornwall.	192.08	192.38
	Base of G.T.R. rail at road crossing, Cornwall.	190.22	190.52
	Base of G.T.R. rail at road crossing.	195.36	195.66
DI.XXX.	Base of G.T.R. rail opposite B.M. DI.XXX.	199.97	200.27
	On N.W. corner of G.T.R. culvert, near Junction.	196.04	196.34
	Base of N.Y. & O. Railway rail at Cornwall station junction.	201.23	201.53
	Base of N.Y. & O. Railway rail at Cornwall station crossing.	216.32	216.62
DI.XI.	Base of N.Y. & O. Railway rail at Cornwall station crossing.	218.83	219.13
"C."	On N.E. face of first pier of N.Y. & O. Ry. bridge, Cornwall.	165.36	165.66
	On upper course of N. wall of old lock 18, Cornwall.	187.98	188.28
DI.XIII.	Flooring, centre of bridge over canal at Augusta street.	184.42	184.72
619	Foot of stairway, landing of new lock 15, Cornwall.	159.50	159.80
"A"	+ On lower end of N. wall of new lock 15, Cornwall.	166.85	167.15
"B"	On lower end of S. wall of new lock 15, Cornwall.	166.73	167.03
	On lower end of S. wall of old lock 15, Cornwall.	162.59	162.89

7-8 EDWARD VII., A. 1908

VAUDREUIL TO NORTH BAY VIA RIGAUD, VANKLEEK HILL, OTTAWA, ARNPRIOR, RENFREW, PEMBROKE AND MATTAWA.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
CCCCXV.	On S. end of W. abutment, G.T.R. bridge over Ottawa river, Vaudreuil.		
CCCCXXX.	Base of G.T.R. rail, opposite B.M. CCCCXV.	88.30	88.01
CCCCXXXI.	On S.E. corner of bridge over brook, opposite Vaudreuil church	80.55	80.80
	Base of C.P.R. rail, centre of bridge, opposite Vaudreuil church	84.55	84.88
	On stone front of Vaudreuil R.C. church.	86.57	86.88
548	Base of C.P.R. rail at crossing.	86.55	86.80
	Brass headed nail in elm root, 50 feet W. of track, $\frac{1}{2}$ mile N. of the Cadieux station.	94.09	94.40
CCCCXXXII.	Base of C.P.R. rail, crossing, Coma, P.Q.	94.34	94.69
	On W. end of S. face of culvert, 1,000 feet S. of Coma station.	90.10	90.50
	Base of C.P.R. rail, opposite B.M. CCCCXXXII.	87.58	87.03
	Base of C.P.R. rail, opposite Coma station.	89.53	89.85
CCCCXXX	Base of C.P.R. rail, main road crossing, Hudson.	99.30	99.62
	On W. end of S. face of culvert, 1,535 feet S. of Hudson station.	113.61	113.94
	Base of C.P.R. rail, opposite B.M. CCCCXXXIII.	97.96	98.31
	Base of C.P.R. rail, opposite Hudson station.	100.23	100.55
	Base of C.P.R. rail, opposite Hudson Heights station.	91.57	91.90
CCCCXX	Base of C.P.R. rail, main road crossing.	87.92	88.24
	On N. end of S. face of culvert, one mile E. of Lavigne station.	98.37	98.69
	Base of C.P.R. rail, opposite B.M. CCCCXXXIV.	87.10	87.53
549	Base of C.P.R. rail, opposite Lavigne station.	90.08	91.01
CCCCXXXV.	Base of C.P.R. rail, opposite main road crossing.	105.64	105.97
	Brass headed nail on elm root, second tree W. of track.	103.07	103.30
CCCCXXXVI.	On S. face of W. abutment of bridge 2 miles E. of Rigaud.	103.43	103.80
CCCCXXXVII.	Base of rail, centre of bridge, 2 miles E. of Rigaud.	98.53	98.89
	Base of C.P.R. rail, opposite Rigaud station.	99.41	99.75
	Base of C.P.R. rail, centre of bridge over Riv. à la Grasse.	103.00	103.24
	On S. face of W. abutment of bridge over Riv. à la Grasse.	104.20	104.54
	On rear end N. side of Rigaud R.C. church.	99.37	99.74
	Base of C.P.R. rail, junction of branch to Pte. Fortune.	108.74	109.11
550	Base of C.P.R. rail, crossing on branch to Pte. Fortune.	106.81	107.15
	+ On N.E. corner of culvert, 4-10 miles from Pte. Fortune junction.	122.17	122.52
551	Base of C.P.R. rail, opposite B.M. 550.	98.90	99.29
	+ On N.E. corner of culvert, 4-8 miles from Pte. Fortune junction.	105.49	105.84
552	Base of C.P.R. rail, opposite B.M. 551.	92.03	92.41
	Brass headed nail on S.W. root of tree, 1,650 feet E. of Pte. Fortune station.	92.20	92.55
CCCCXXXVIII.	Base of C.P.R. rail at Pte. Fortune station.	126.06	126.44
553	On centre of E. foundation of Pte. Fortune post office.	123.57	123.93
	Brass headed nail on S.W. corner of Pte. Fortune post office wharf.	83.73	84.13
	Base of C.P.R. rail crossing, 2 $\frac{1}{2}$ miles W. of Rigaud bridge	80.41	80.81
	Base of C.P.R. rail, crossing boundary between Quebec and Ontario.	147.20	147.64
CCCCXXXIX.	Base of C.P.R. rail, crossing one mile E. of St. Eugene.	171.77	172.12
CCCCXL.	Base of C.P.R. rail at St. Eugene station.	182.92	183.28
CCCCXLI.	Base of C.P.R. rail, centre of St. Eugene station culvert.	180.90	181.27
CCCCXLII.	On S. end of W. wall of St. Eugene station culvert.	180.82	181.19
	Under bay window of priest's residence, St. Eugene.	177.41	177.84
	On N.E. corner stone front of St. Eugene R.C. church.	190.43	190.82
	Base of C.P.R. crossing.	191.54	191.94
CCCCXLIII.	On S. end of W. face of culvert, 3 miles W. of St. Eugene station.	184.19	184.55
	Base of C.P.R. rail, centre of culvert W. of St. Eugene station.	226.43	226.82
	On E. end of W. face of culvert, 3 miles W. of St. Eugene station.	232.06	232.42
	Base of C.P.R. rail first crossing E. of station.	226.43	226.82
	Base of C.P.R. rail at Starbale station.	250.00	250.38
	Base of C.P.R. rail at Starbale station crossing.	290.39	290.77
CCCC.	Base of C.P.R. rail, centre of culvert, marked 31.8 miles.	290.88	291.26
	On S. side of E. abutment of culvert along C.P.R., marked 31.8 miles.	250.56	250.97
CCCCI.	On centre of W. side of Hawkesbury R.C. church.	247.08	248.38
	Base of G.T.R. rail at G.T.R. station, Hawkesbury.	147.92	148.34
	Base of G.T.R. rail, Main street crossing, Hawkesbury.	142.95	143.34
560	On N.E. corner of culvert near junction of G.N.R.	143.81	144.20
	Base of G.T.R. rail, crossing of Morris lane, Hawkesbury.	159.36	159.78
	Base of G.T.R. rail crossing, branch to Hawkesbury.	180.88	181.28
	Base of G.T.R. rail crossing, branch to Hawkesbury.	183.00	183.39
	Base of G.T.R. rail crossing, branch to Hawkesbury.	241.29	241.67
	Base of G.T.R. rail crossing, branch to Hawkesbury.	258.37	258.75
	Base of C.P.R. rail, crossing of G.T.R. to Hawkesbury.	263.84	264.27

SESSIONAL PAPER No. 19a

VAUDREUIL to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
559	Brass headed nail on elm tree, 100 feet S. of C.P.R. and 150 feet E. of G.T.R.	261.21	261.62
	Base of rail at crossing of G.T.R. railway to Hawkesbury.	263.90	264.27
	Base of rail at Vankleek Hill crossing.	270.80	271.28
	Base of rail at Vankleek Hill station.	271.53	271.92
	Base of rail, third crossing, E. of McAlpin's station.	261.21	261.60
CCCCXLIX.	Base of rail, second crossing E. of McAlpin's station.	216.25	216.63
	On N.E. corner of McAlpin's post office.	223.28	223.69
	Base of rail at McAlpin's station.	221.79	222.17
	Base of rail at second crossing E. of Caledonia Springs.	213.15	213.55
CCCCXLVIII.	Base of rail, first crossing E. of Caledonia Springs.	188.03	188.33
	On S. end, E. abutment of culvert marked 33.33 miles.	181.00	181.42
	Base of C.P.R. rail, centre of culvert, marked 33.33 miles.	183.55	183.95
CCCCXLVII.	Base of C.P.R. rail at Caledonia Springs station.	167.38	167.77
	On N. face of post office, Caledonia Springs.	166.84	167.23
	Base of C.P.R. rail, crossing Caledonia Springs.	167.45	167.85
	Base of C.P.R. rail, centre of trestle, Caledonia Springs.	167.42	167.82
	Base of C.P.R. rail at crossing, Caledonia Springs.	170.72	171.13
558	Brass headed nail, centre of culvert, marked 43 miles.	172.18	172.62
	Base of rail, crossing opposite peat factory.	174.54	174.95
	Base of rail, crossing.	178.66	179.07
	Base of rail at Alfred station.	177.47	177.88
	Base of rail, first crossing W. of Alfred station.	177.79	178.21
	Base of rail, second crossing W. of Alfred station.	176.01	176.43
	Base of rail, third crossing E. of Plantagenet station.	174.54	174.95
	Base of rail, second crossing, E. of Plantagenet station.	198.42	198.83
CCCCXVI.	On N. face, E. abutment, bridge over S. Nation river.	168.59	169.05
CCCCXV.	Base of C.P.R. rail, centre of bridge over S. Nation river.	169.73	170.16
	On S. face, N. abutment, bridge over S. Nation river.	165.21	165.66
	Base of C.P.R. rail at Plantagenet crossing.	169.58	170.00
557	Base of C.P.R. rail at Plantagenet station.	169.51	169.93
	On N.E. corner of bridge, marked 51.3 miles.	169.78	170.24
	Base of C.P.R. rail, centre of bridge, marked 51.3 miles.	171.69	172.12
	Base of C.P.R. rail crossing, Plantagenet.	211.21	211.64
556	Brass headed nail, centre of wooden bridge, marked 54.2 miles.	212.21	212.70
	Base of C.P.R. rail at crossing, Pendleton.	241.37	241.80
	Base of C.P.R. rail at crossing, Pendleton.	241.34	241.76
	Base of C.P.R. rail at Pendleton station crossing.	233.10	233.53
	Base of C.P.R. rail at Pendleton station crossing.	231.80	232.23
CCCCXIV.	Base of C.P.R. rail, fifth crossing, E. of The Brook station.	217.12	217.56
	On S. face of E. abutment of culvert, marked 57 miles.	192.32	192.78
	Base of C.P.R. rail, centre of culvert, marked 57 miles.	194.53	194.97
	Base of C.P.R. rail, fourth crossing, E. of The Brook station.	164.01	165.34
555	Brass headed nail, N. side of E. end of trestle over The Brook.	163.68	164.15
	Base of C.P.R. rail, centre of bridge over The Brook.	165.59	166.02
	Base of C.P.R. rail, third crossing E. of The Brook station.	167.20	167.74
	Base of C.P.R. rail, second crossing E. of The Brook station.	189.07	189.52
CCCCXIII.	Base of C.P.R. rail at The Brook crossing.	206.51	206.96
554	Under first window, N. side of The Brook R.C. church.	209.83	210.31
	Brass headed nail on W. root of tree, 75 feet S. of track, The Brook crossing.	212.15	212.63
	Base of C.P.R. rail, opposite The Brook station.	214.78	215.23
	Base of C.P.R. rail, first crossing, W. of The Brook station.	215.58	216.02
	Base of C.P.R. rail, second crossing, W. of The Brook station.	214.92	215.37
	Base of C.P.R. rail, third crossing, W. of The Brook station.	213.63	214.08
CCCCXII.	Base of C.P.R. rail, fourth crossing, W. of The Brook station.	210.67	211.12
	On N. end of E. wall of culvert on C.P.R., marked 64.1 miles.	206.66	207.15
	Base of C.P.R. rail, centre of culvert, marked 64.1 miles.	211.44	211.90
	Base of C.P.R. rail, 5th crossing, W. of The Brook station.	218.38	218.84
	Base of C.P.R. rail at Hammond station.	219.54	219.99
	Base of C.P.R. rail, crossing of G.T.R. to Rockland.	219.59	220.04
	Base of C.P.R. rail, first crossing W. of Hammond station.	242.34	242.80
	Base of C.P.R. rail, second crossing W. of Hammond station.	267.70	268.16
	Base of C.P.R. rail, third crossing W. of Hammond station.	274.22	274.68
	Base of C.P.R. rail, fourth crossing W. of Hammond station.	273.66	274.13
	Base of C.P.R. rail at Leonard station.	276.54	277.01
	Base of C.P.R. rail at Leonard crossing.	271.64	272.10
CCCCXI.	On N.W. corner of Leonard county court house.	271.56	272.03
	Base of C.P.R. rail, second crossing W. of Leonard station.	271.38	271.87
	Base of C.P.R. rail, third crossing W. of Leonard station.	276.49	276.95
	Base of C.P.R. rail, fourth crossing W. of Leonard station.	276.96	277.42
	Base of C.P.R. rail, fifth crossing W. of Leonard station.	271.21	271.69
	Base of C.P.R. rail at Navan station.	237.95	238.42
	Base of C.P.R. rail at Navan station crossing.	239.07	240.44
	Base of C.P.R. rail, second crossing W. of Navan station.	238.68	239.15
	Base of C.P.R. rail, third crossing W. of Navan station.	235.49	235.96
	Base of C.P.R. rail, fourth crossing W. of Navan station.	234.41	234.89
	Base of C.P.R. rail, fifth crossing W. of Navan station.	229.29	229.77
	Base of C.P.R. rail, sixth crossing W. of Navan station.	230.29	230.77

7-8 EDWARD VII., A. 1908

VAUDREUIL to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
561	Base of C.P.R. rail at Blackburn station.	229.01	229.49
	Base of C.P.R. rail at Blackburn crossing.	227.99	228.45
	+ On S.W. corner of culvert, 3½ miles E. of Rideau river.	209.87	210.33
	Base of C.P.R. rail, third crossing E. of Rideau river.	226.32	230.41
	Base of C.P.R. rail, second crossing E. of Rideau river.	219.81	220.30
	Base of C.P.R. rail at crossing E. side of Rideau river.	197.09	197.58
CCCCIV.	On N. side of E. abutment, C.P.R. bridge over Rideau river.	197.32	197.81
	Base of rail, centre of C.P.R. bridge over Rideau river.	194.68	195.22
CCCCV.	Base of rail, centre of G.T.R. bridge over Rideau river.	197.69	198.20
CCCCV.	On East of E. face of W. abutment, Laurier bridge, Ottawa.	195.11	195.61
CCCCV.	On W. side of main entrance to Woods building, Ottawa.	217.19	217.72
CCCCV.	Under second window, S. side of City Hall, Ottawa.	223.12	223.65
CCCCVI.	Base of rail at Central station, Ottawa.	240.36	240.89
562	On N.E. corner of W. pier of Dufferin bridge, Ottawa.	213.71	214.21
CCCCVII.	+ On W. end of lower gates of lock 1, Rideau canal.	212.82	213.35
	Foot of W. curved wall of lock 1, Rideau canal.	141.14	151.68
	Zero of lock 1 gauge, Rideau canal.	135.18	135.72
	Coping, E. end of lower gates of lock 1, Rideau canal.	122.37	122.90
CCCCXXIII.	Coping, E. end of lower gates of lock 2, Rideau canal.	154.11	154.65
	On shore end of E. face of lock 1, Rideau canal.	154.11	154.65
	Coping, E. end of lower gates of lock 3, Rideau canal.	153.11	153.66
	Coping, E. end of lower gates of lock 4, Rideau canal.	169.87	170.30
	Coping, E. end of lower gates of lock 5, Rideau canal.	170.06	170.59
	Coping, E. end of lower gates of lock 6, Rideau canal.	179.89	180.42
	Coping, E. end of lower gates of lock 7, Rideau canal.	189.93	190.47
	Coping, E. end of lower gates of lock 8, Rideau canal.	199.71	200.24
CCCCVI.	Coping, E. end of upper gates of lock 8, Rideau canal.	211.66	212.19
	On N.E. corner of W. pier of Dufferin bridge, Ottawa.	211.69	212.23
	Base of C.P.R. rail, centre of Alexandra bridge.	212.81	213.35
	High water elevation of Hull concrete wharf.	192.30	192.85
CCCCXXII.	Medium elevation of Hull concrete wharf.	146.56	147.07
	70 feet from S.W. corner of Hull concrete wharf.	110.85	111.35
CCCCXXI.	Coping, W. shore end of Hull concrete wharf.	146.56	147.09
	On E. abutment of C.P.R. crossing of E. Ry., Hull end of Alexandra bridge.	147.01	147.52
CCCCXX.	On S.E. side of rear entrance to Hull R.C. church.	171.01	171.51
	Centre of Union bridge between Hull and Ottawa.	177.71	178.25
CCCCXIX.	On E. end of N. abutment of bridge between Ottawa and Hull.	161.3	161.84
CCCCX.	Under second window, S. side of City Hall, Ottawa.	161.07	161.66
CCCCXVIII.	Between first and second window, Mortimer Co. building, Ottawa.	240.35	240.89
CCCCXVII.	On W. side of entrance N. side of Water Works building, Ottawa.	138.35	248.91
CCCCXVI.	On S. side of private entrance Union station, Ottawa.	179.00	179.54
	Base of C.P.R. rail at Union station, Ottawa.	181.3	185.06
CCCCXV.	Base of C.P.R. rail, centre of Prince of Wales bridge, Ottawa.	179.93	181.43
	On W. side of W. abutment, centre of Prince of Wales bridge, Ottawa.	190.78	191.28
	Base of C.P.R. crossing, Chauviere St., Ottawa.	155.35	155.89
	Base of C.P.R. crossing, Centre street, Ottawa.	182.45	185.96
	Base of C.P.R. crossing, Queen street, Ottawa.	198.78	199.30
CCCCXIV.	Base of C.P.R. crossing.	202.87	203.38
	On S. end of W. wall of culvert 1.7 miles W. of Ottawa.	214.56	215.09
	Base of C.P.R. rail, centre of culvert, 1.7 miles W. of Ottawa.	200.24	200.79
	Base of C.P.R. rail crossing, 1,500 feet W. of Exchange Hotel.	205.73	206.25
	Base of C.P.R. rail, centre of culvert, 1 mile E. of Britannia station.	216.98	217.49
CCCCXIII.	On N. side of E. wall of G.T.R. culvert, 1 mile E. of Britannia station.	192.19	192.71
CCCCXII.	On S.E. corner of J. Whitton house, next to Britannia P.O.	190.35	190.89
	Base of C.P.R. rail, opposite post office crossing, Britannia.	203.19	203.74
	Base of C.P.R. rail, opposite O.E. Ry. pier, Britannia.	202.85	203.38
	On inner down stream, corner of O.E. Ry. pier, Britannia.	202.35	202.88
	On inner up stream, corner of O.E. Ry. pier, Britannia.	198.39	198.95
	Base of C.P.R. rail, second crossing E. of G.T.R. crossing.	198.48	199.03
	Base of C.P.R. rail, first crossing E. of G.T.R. crossing.	206.87	207.40
	Base of G.T.R. rail, under G.T.R. crossing of C.P.R.	214.13	214.65
CCCCXI.	Base of G.T.R. rail, centre of overhead crossing of C.P.R.	217.67	218.19
567	On S. side of W. wall of G.T.R. crossing of C.P.R.	241.61	242.13
	On N. side of W. wall of G.T.R. crossing of C.P.R.	238.60	239.15
	Base of G.T.R. rail, centre of trestle.	241.19	241.75
	Base of G.T.R. rail, centre of trestle.	235.60	236.13
	Base of G.T.R. rail, sixth crossing E. of S. March station.	219.51	220.03
	Base of G.T.R. rail, fifth crossing E. of S. March station.	219.78	220.30
	Centre of culvert, back of John Beattie's house.	219.84	220.36
568	On S.E. corner of culvert, back of John Beattie's house.	242.14	242.67
	Base of G.T.R. rail, fourth crossing E. of March station.	240.97	241.54
	Base of G.T.R. rail, third crossing E. of March station.	245.67	246.21
		251.83	252.37

SESSIONAL PAPER No. 19a

VAUDREUIL to North Bay, &c.—Complete List of Bench Marks, &c.—Continued,

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
565	Base of G. T. R. rail, second crossing E. of March station...	257.00	257.04
	Base of G. T. R. rail, first crossing E. of March station...	271.86	271.14
	Base of G. T. R. rail, at South March station...	283.12	283.66
	Base of G. T. R. rail, culvert, 700 feet W. of S. March station, On S.E. corner of G. T. R. culvert, 700 feet W. of S. March station...	283.70	289.24
564	Base of G. T. R. rail, first crossing W. of March station...	296.08	287.24
	Base of G. T. R. rail, third crossing E. of Carp station...	320.04	320.30
	Base of G. T. R. rail, main road crossing, Carp station...	338.13	338.66
	Base of G. T. R. rail, culvert 3 miles E. of Carp station...	321.03	321.57
563	On S.E. corner of culvert 3 miles E. of Carp station...	319.58	320.12
	Base of G. T. R. rail, centre of culvert, Carp...	317.66	318.53
	Base of G. T. R. rail, first crossing E. of Carp station...	316.14	316.68
	Brass headed nail on S.E. corner of culvert 1.430 feet E. of Carp station...	316.51	311.06
CCCCX.	Base of G. T. R. rail, centre of culvert, 1.150 ft. E. of Carp station...	309.00	310.52
	Base of G. T. R. rail, opposite Carp station...	310.58	311.12
	Base of G. T. R. rail, 1st crossing W. of Carp station...	310.31	310.36
	Base of G. T. R. rail, 2nd crossing W. of Carp station...	307.01	307.55
CCCCXXIV.	Base of G. T. R. rail, centre of culvert over Carp river...	305.88	306.42
	On N. side of E. abutment, G. T. R. culvert over Carp river...	309.73	310.29
	On S. side of E. wall of culvert, 3 miles W. of Carp station...	307.45	307.93
	Base of G. T. R. rail, centre of culvert, 3 miles W. of Carp station...	311.81	312.40
570	Base of G. T. R. rail, 4th crossing W. of Carp station...	310.04	310.62
	Base of G. T. R. rail, 5th crossing W. of Carp station...	312.87	313.43
	Base of G. T. R. rail, 6th crossing W. of Carp station...	305.07	309.22
	On S.E. corner of G. T. R. culvert, 4 miles E. of Kinburn station...	305.09	305.94
571	Base of G. T. R. rail, opposite bench mark 570...	303.28	303.86
	Base of G. T. R. rail at Ayonahle crossing...	303.07	304.53
	On S.W. corner of culvert, 2.10 miles E. of Kinburn station...	305.87	306.43
	Base of G. T. R. rail, opposite bench mark 571...	305.95	306.52
572	Base of G. T. R. rail, 1st crossing E. of Kinburn station...	307.52	308.12
	Base of G. T. R. rail, 2nd crossing E. of Kinburn station...	308.33	308.90
	Base of G. T. R. rail, 3rd crossing E. of Kinburn station...	314.30	314.87
	Base of G. T. R. rail, at Kinburn crossing...	311.51	312.09
573	On S.E. corner of G. T. R. culvert, 930 ft. W. of Kinburn station...	310.38	310.94
	Base of G. T. R. rail, centre of culvert, 930 ft. W. of Kinburn station...	307.25	316.85
	Base of G. T. R. rail, centre of culvert over large brook...	307.94	308.50
	Base of G. T. R. rail, 2nd crossing W. of Kinburn station...	308.14	308.71
574	Base of G. T. R. rail, 3rd crossing W. of Kinburn station...	312.97	313.55
	On N.E. corner of culvert, 2 miles W. of Kinburn station...	333.25	321.82
	Base of G. T. R. rail, opposite bench mark 573...	335.36	335.97
	Base of G. T. R. rail, 4th crossing W. of Kinburn station...	330.25	336.81
CCCCXXV.	Base of G. T. R. rail, 5th crossing W. of Kinburn station...	336.76	337.34
	On E. side of N. abutment of G. T. R. bridge Mississippi river...	310.89	311.47
	Centre of over bench crossing of main road, Galetta...	290.93	291.51
	On up stream end of S.W. abutment, bridge over Mississippi river...	289.96	290.54
CCCCXXVI.	Centre of over bench crossing of main road, Galetta...	290.13	290.73
	Base of G. T. R. rail at Galetta station...	289.06	290.53
	Base of G. T. R. rail, 1st crossing W. of Galetta station...	292.75	293.32
	Base of G. T. R. rail, 2nd crossing W. of Galetta station...	291.06	294.24
575	On N.E. corner of culvert, 1.1 miles W. of Galetta station...	304.08	304.67
	Base of G. T. R. rail, 1st crossing W. of Marshall's Bay station...	307.28	307.90
	Base of G. T. R. rail, 2nd crossing W. of Marshall's Bay station...	312.17	312.75
	Base of G. T. R. rail, 3rd crossing W. of Marshall's Bay station...	308.30	308.89
CCCCXXVII.	Base of G. T. R. rail, 4th crossing W. of Marshall's Bay station...	313.80	314.39
	Base of G. T. R. rail, German street crossing, Arnprior...	310.67	311.25
	Base of G. T. R. rail, Russell street crossing, Arnprior...	292.34	292.91
	Base of G. T. R. rail, Daniel street crossing, Arnprior...	293.84	294.42
CCCCXXVIII.	Base of G. T. R. rail, John street crossing, Arnprior...	295.50	296.08
	On centre of W. end foundation, P. P. R. station, Arnprior...	297.47	298.05
	Base of C. P. R. rail at crossing of G. T. R., Arnprior...	298.22	298.82
	Base of C. P. R. rail, Norma street crossing, Arnprior...	300.55	301.17
576	Base of C. P. R. rail, town line crossing, Arnprior...	300.67	300.67
	On elm tree, close to C. P. R. W. fence, 5.575 ft. W. of C. T. R. station...	300.59	301.18
	Base of C. P. R. rail, 3rd crossing W. of Arnprior station...	301.12	301.71
	On N.E. corner of culvert, 5.41 miles W. of Ottawa...	298.32	298.95
CCCCXXIX.	Base of C. P. R. rail, opposite bench mark CCCCXXVIII...	299.33	299.92
	Base of C. P. R. rail, at Brasside crossing...	279.57	280.20
	Base of C. P. R. rail, 1st crossing W. of Brasside crossing...	284.73	285.33
	Base of C. P. R. rail, 2nd crossing W. of Brasside crossing...	278.58	279.18

7-8 EDWARD VII., A, 1908
 VAUDREUIL to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
CCCCCLXXIX.	Base of C. P. R. rail, at Brasserie station.	278.85	270.45
582	On N.W. face of culvert, 50.9 miles W. of Ottawa.	264.81	265.44
	Base of C. P. R. rail, on opposite bench mark CCCCCXXXIX.	274.22	274.83
CCCCCLXXXVII.	On S.W. corner of culvert, 50.9 miles W. of Ottawa.	273.12	273.75
	Base of C. P. R. rail, opposite bench mark 582.	275.41	276.02
CCCCCLXXXVI.	Base of C. P. R. rail, at Sand Point station.	264.82	265.43
	On front of new brick school, centre of Sand Point village.	267.07	267.71
581	Base of C. P. R. rail, 1st crossing W. of Sand Point station.	268.76	269.37
	Base of C. P. R. rail, 3rd crossing W. of Sand Point station.	287.16	287.77
580	Base of C. P. R. rail, opposite bench mark CCCCCXXXVI.	288.43	289.04
	On W. end of N. face of culvert, 50.7 miles W. of Ottawa.	260.02	270.53
579	Base of C. P. R. rail, culvert, 60.6 miles W. of Ottawa.	261.02	262.56
	On N.E. corner of culvert, 60.6 miles W. of Ottawa.	251.22	251.82
578	Base of C. P. R. rail, 1st crossing E. of Castleford station.	250.07	250.70
	Base of C. P. R. rail, at Castleford station.	255.93	256.60
577	Base of C. P. R. rail, 1st crossing W. of Castleford station.	261.86	264.47
	Centre of C. P. R. bridge over brook W. of Castleford station.	261.50	265.11
576	Base of C. P. R. rail, 2nd crossing W. of Castleford station.	265.58	266.20
	On N.E. corner of culvert, 63.5 miles W. of Ottawa.	311.53	303.74
CCCCCLXXXV.	Base of C. P. R. rail, 4th crossing E. of Russell station.	311.53	303.74
	Base of C. P. R. rail, 2nd crossing E. of Russell station.	311.53	303.74
CCCCCLXXXIV.	Base of C. P. R. rail, 1st crossing E. of Russell station.	311.53	303.74
	On N.W. corner of culvert, 66.7 miles W. of Ottawa.	403.77	409.74
575	Base of C. P. R. rail, at Russell platform station.	403.54	410.40
	Base of C. P. R. rail, 4th crossing E. of Renfrew station.	415.44	416.00
574	Base of C. P. R. rail, opposite bench mark 578.	442.52	443.14
	On N.W. corner of culvert, 68.5 miles W. of Ottawa.	430.75	440.38
573	Base of C. P. R. rail, 3rd crossing E. of Renfrew station.	430.21	439.80
	Base of C. P. R. rail, 2nd crossing E. of Renfrew station.	441.71	445.33
572	On N. base of C. P. R. tank, Renfrew station.	441.49	442.12
	On E. end of foundation of Renfrew station.	418.38	419.01
571	Base of C. P. R. rail, at Renfrew station.	418.58	419.25
	Base of C. P. R. rail, crossing W. of Douglas street, Renfrew.	417.82	418.48
570	Base of C. P. R. rail, crossing of Monroe street, Renfrew.	415.81	416.45
	Base of C. P. R. rail, crossing of Main street, Renfrew.	414.52	415.15
569	Base of C. P. R. rail, crossing of Argyle street, Renfrew.	412.05	412.69
	Base of C. P. R. rail, crossing E. of Douglas street, Renfrew.	416.20	416.80
568	Base of C. P. R. rail, crossing W. of Douglas street, Renfrew.	407.41	407.00
	On S. end of S. abutment bridge over Bonnechere river.	399.44	403.11
567	Centre of C. P. R. bridge over Bonnechere river.	398.55	400.12
	On E. face of N. abutment, C. P. R. bridge over Bonnechere river.	388.03	388.69
566	Base of C. P. R. rail, 3rd crossing E. of Eganville Junction.	388.12	388.76
	On N.E. corner of culvert, 72.5 miles W. of Ottawa.	385.34	386.00
565	Base of C. P. R. rail, 2nd crossing E. of Eganville Junction.	400.80	401.44
	Base of C. P. R. rail, 1st crossing E. of Eganville Junction.	403.00	403.62
564	Base of C. P. R. rail, at Eganville Junction.	403.27	403.93
	On N.W. corner of culvert, 74.6 miles W. of Ottawa.	405.20	405.83
563	Base of C. P. R. rail, opposite bench mark 576.	403.81	404.44
	Base of C. P. R. rail, 2nd crossing E. of Haley's station.	405.02	405.66
562	Base of C. P. R. rail, 1st crossing E. of Haley's station.	431.40	432.04
	On E. face of C. P. R. culvert, 76.88 miles W. of Ottawa.	431.12	431.79
561	Base of C. P. R. rail, opposite bench mark CCCCCXXXI.	411.66	412.30
	Base of C. P. R. rail, at Haley's station.	511.80	512.44
560	Base of C. P. R. rail, 2nd crossing W. of Haley's station.	515.30	516.03
	Base of C. P. R. rail, opposite bench mark CCCCCXXX.	511.56	512.23
559	On E. face of C. P. R. culvert, 80.1 miles W. of Ottawa.	528.63	529.28
	Base of C. P. R. rail, 3rd crossing W. of Haley's station.	520.49	527.15
558	Base of C. P. R. rail, 4th crossing W. of Haley's station.	510.37	510.88
	On E. end of N. abutment of C. P. R. bridge over Goul's brook.	517.87	518.53
557	Base of C. P. R. rail, 5th crossing W. of Haley's station.	509.50	510.10
	On E. face of C. P. R. culvert, 81.1 miles W. of Ottawa.	517.87	518.53
556	Base of C. P. R. rail, 3rd crossing W. of Haley's station.	507.46	508.14
	Base of C. P. R. rail, 4th crossing W. of Haley's station.	511.57	512.23
555	Base of C. P. R. rail, 5th crossing W. of Haley's station.	507.08	508.33
	On E. end of N. abutment of C. P. R. bridge over Goul's brook.	499.48	497.13
554	Base of C. P. R. rail, centre of C. P. R. bridge over Goul's brook.	499.55	500.20
	Base of C. P. R. rail, 1st crossing E. of Cobden station.	474.47	475.17
553	Base of C. P. R. rail, at Cobden station.	477.06	477.72
	Base of C. P. R. rail, 1st crossing W. of Cobden station.	474.82	475.49
552	Base of C. P. R. rail, 1st crossing W. of Cobden station.	474.91	475.57
	Base of C. P. R. rail, 1st crossing W. of Cobden station.	475.60	476.27

SESSIONAL PAPER No. 19a

VAPOREUR to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
477CNC.	On E. face of C. P. R. culvert, 86.3 miles W. of Ottawa...	472.96	473.55
477CNCI.	Base of C. P. R. rail, culvert, 86.3 miles W. of Ottawa...	477.99	478.00
	On E. face of C. P. R. culvert, 87.2 miles W. of Ottawa...	472.74	473.15
	Base of C. P. R. rail, culvert, 87.2 miles W. of Ottawa...	478.72	479.30
477CNCII.	Base of C. P. R. rail, 2nd crossing W. of Cobden station...	449.87	450.54
	On W. face of C. P. R. culvert, 90.4 miles W. of Ottawa...	427.31	428.02
	Base of C. P. R. rail, culvert, 80.4 miles W. of Ottawa...	434.27	434.95
	Base of C. P. R. rail, 3rd crossing W. of Cobden station...	433.26	433.93
	Base of C. P. R. rail, 4th crossing W. of Cobden station...	441.79	442.44
	Base of C. P. R. rail, 5th crossing W. of Cobden station...	444.70	445.37
	Base of C. P. R. rail, Snake River crossing...	423.01	424.29
583	On E. side of S. end of C. P. R. bridge over Snake river...	423.05	423.73
	Centre of C. P. R. bridge over Snake river...	433.16	433.88
	Base of C. P. R. rail, first crossing W. of Snake River...	415.10	415.85
584	On end of C. P. R. culvert, 92.7 miles W. of Ottawa...	433.05	433.73
	Base of C. P. R. rail, centre of culvert, 92.7 miles W. of Ottawa...	441.40	441.04
	Base of C. P. R. rail, second crossing W. of Snake River station...	441.51	441.20
585	On E. end of C. P. R. culvert, 93.8 miles W. of Ottawa...	435.16	435.84
CCCCXIII.	Base of C. P. R. rail, culvert, 94.8 miles W. of Ottawa...	417.73	418.44
	On W. end of S. wall of culvert, 94.7 miles W. of Ottawa...	415.36	416.04
	Base of C. P. R. rail, culvert, 94.7 miles W. of Ottawa...	418.78	419.49
	Base of C. P. R. rail at Graham station...	424.28	424.97
	Base of C. P. R. rail, centre of bridge over Muskoka river...	415.53	416.21
CCCCXIV.	Base of C. P. R. rail, first crossing W. of Graham station...	415.07	415.76
	On rock on E. side of track, 97.1 miles W. of Ottawa...	419.00	419.70
CCCCXV.	Base of C. P. R. rail opposite B.M. CCCCCXIV...	429.56	430.29
	On E. face of C. P. R. culvert, 99 miles W. of Ottawa...	427.01	428.01
	Base of C. P. R. rail, culvert, 99 miles W. of Ottawa...	440.62	441.35
	Base of C. P. R. rail, government road crossing, Pembroke...	442.00	442.70
	Base of C. P. R. rail, government road platform, Pembroke...	421.27	421.84
586	On W. end of C. P. R. culvert, 100.7 miles W. of Ottawa...	422.14	422.97
	Base of C. P. R. rail, opposite B.M. 585...	385.55	386.20
	Base of C. P. R. rail, first crossing W. of government road sta...	387.29	388.00
	Base of C. P. R. rail, second crossing W. of govt. road station...	377.83	378.54
589	Brass levelled rail, 11 feet from lower end of inner edge of wharf...	381.91	382.61
	Base of C. P. R. rail, third crossing W. of govt. road station...	376.22	376.90
	Base of C. P. R. rail, fourth crossing W. of govt. road station...	382.31	383.01
	Base of C. P. R. rail, third crossing E. of Pembroke station...	378.76	379.46
	Base of C. P. R. rail, second crossing E. of Pembroke station...	379.37	380.09
	Base of C. P. R. rail, first crossing E. of Pembroke station...	379.26	379.98
CCCCXVI.	Base of C. P. R. rail at Pembroke station...	380.32	381.04
DIII.	Under window, N. end of Pembroke station...	380.18	380.89
593	On E. face of chimney of Pembroke water works building...	382.29	383.04
	On S. end of culvert, E. side of crossing E. of Petawawa...	377.15	378.10
	Base of C. P. R. rail, thirteenth crossing E. of Petawawa...	398.45	399.17
	Base of C. P. R. rail, twelfth crossing E. of Petawawa...	399.83	400.54
	Base of C. P. R. rail, eleventh crossing E. of Petawawa...	414.14	414.86
DII.	On S.W. corner of culvert, 108.3 miles W. of Ottawa...	437.72	438.43
	Base of C. P. R. rail, tenth crossing E. of Petawawa station...	409.02	409.80
	Base of C. P. R. rail, opposite B.M. DII...	427.77	428.48
DI.	On N. end of E. face of culvert, 109.2 miles W. of Ottawa...	447.98	448.74
	Base of C. P. R. rail, ninth crossing E. of Petawawa station...	440.07	440.82
	Base of C. P. R. rail, eighth crossing E. of Petawawa station...	460.31	461.06
	Base of C. P. R. rail, seventh crossing E. of Petawawa station...	471.30	472.04
	Base of C. P. R. rail, 111.7 miles W. of Ottawa...	481.16	481.88
D.	On N.W. face of culvert, 111.7 miles W. of Ottawa...	481.92	482.65
	Base of C. P. R. rail, sixth crossing E. of Petawawa station...	467.03	467.79
	Base of C. P. R. rail, fifth crossing E. of Petawawa station...	482.10	482.82
592	On S.W. corner of culvert, 112.75 miles W. of Ottawa...	481.34	482.07
	Base of C. P. R. rail, fourth crossing E. of Petawawa station...	484.21	484.96
	Base of C. P. R. rail, third crossing E. of Petawawa station...	484.59	485.32
	Base of C. P. R. rail, second crossing E. of Petawawa station...	477.18	477.91
	Base of C. P. R. rail, road to Petawawa wharf...	474.46	475.19
	Base of C. P. R. rail at Petawawa station...	468.61	469.35
DIV.	On S. face of rocky point, near water's edge 1,400 feet above wharf...	466.01	467.34
691	Grass levelled rail, up stream front end of Petawawa wharf...	383.47	384.24
591	Centre of C. P. R. culvert at road to Petawawa wharf...	373.71	374.48
	On centre of E. end of culvert at road to Petawawa wharf...	464.19	464.93
	Base of C. P. R. rail, at crossing to Petawawa wharf...	463.36	464.12
CCCCXCIX.	Centre of C. P. R. bridge over Petawawa river...	464.21	464.94
	On up stream end of W. abutment of bridge over Petawawa river...	456.66	457.39
	Base of C. P. R. rail, fifth crossing E. of Thistle station...	455.52	456.29
	Centre of C. P. R. culvert, 117.4 miles W. of Ottawa...	482.36	483.09
590	On S.W. corner of C. P. R. culvert, 117.1 miles W. of Ottawa...	483.44	484.17
	Base of C. P. R. rail, fourth crossing E. of Thistle station...	483.06	483.83
		483.45	484.17

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VAUDREUIL to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
589	Base of C.P.R. rail, third crossing E. of Thistle station.	498.49	499.23
	Base of C.P.R. rail, second crossing E. of Thistle station.	505.12	505.87
	Centre of C.P.R. culvert, 120.2 miles W. of Ottawa.	509.84	510.59
	On S.E. corner of culvert, 120.2 miles W. of Ottawa.	509.16	509.93
	Base of C.P.R. rail, first crossing E. of Thistle station.	505.47	506.21
CCCCXVIII.	Base of C.P.R. rail, Thistle flag station.	508.18	50.92
	Base of C.P.R. rail, opposite B.M. CCCCXVIII.	491.93	495.68
	On N. end of E. face of culvert, 122.7 miles W. of Ottawa.	490.24	491.02
	Base of C.P.R. rail, third crossing E. of Chalk River station.	485.52	486.28
	On S.W. corner, E. end of bridge over Chalk river.	483.11	483.90
588	Base of C.P.R. rail, centre of bridge over Chalk river.	486.52	487.27
	Base of C.P.R. rail, second crossing E. of Chalk River station.	486.44	487.20
	On S.W. corner of culvert, 125.3 miles W. of Ottawa.	493.84	494.59
	Base of C.P.R. rail, first crossing E. of Chalk River station.	493.55	494.33
	Base of C.P.R. rail, opposite Chalk River station.	510.76	511.52
CCCCXVII.	On S.E. end, stone foundation of turntable, Chalk River.	522.96	523.72
	Base of C.P.R. rail, crossing W. end of Chalk River yard.	521.45	522.23
	On S.E. corner of C.P.R. culvert, 2.16 miles N. of Chalk River station.	517.84	518.59
	Base of C.P.R. rail, opposite B.M. 594.	516.15	516.25
	Base of C.P.R. rail, crossing, 5 miles W. of Chalk River.	516.36	517.14
595	Base of C.P.R. rail, opposite Willie station.	527.61	52.41
	On S.W. corner of culvert, 5.27 miles W. of Chalk River.	527.75	52.54
	Base of C.P.R. rail, opposite B.M. 595.	525.21	526.92
	On boulder, 15 feet N.E. of track, 100 feet W. of culvert, 6.12 miles W. of Chalk River.	527.49	52.58
	Base of C.P.R. rail, opposite B.M. 596.	526.77	527.55
DV.	On W. side of S. abutment of bridge over W. branch of Chalk river.	529.51	527.28
	Base of rail, centre of bridge, over W. branch of Chalk river.	526.96	527.76
	On N.W. corner of culvert, 8.91 miles W. of Chalk River.	530.30	531.07
	Base of C.P.R. rail, opposite B.M. 597.	531.5	532.67
	Base of C.P.R. rail, opposite Bass Lake station.	536.83	537.61
DVI.	On N.E. corner of culvert, 10.32 miles W. of Chalk River.	587.87	588.66
	Base of C.P.R. rail, opposite B.M. DVI.	588.77	589.55
	On boulder, close to N. rail, 12.82 miles W. of Chalk River.	603.69	604.47
	Base of C.P.R. rail, opposite B.M. 598.	602.65	603.42
	On rock, S. side of gateway to McEwen's hotel, Moor Lake sta.	607.51	608.42
599	Base of C.P.R. rail, opposite Moor Lake station.	605.50	606.31
	On rock E. of track, 90 feet S. of mile 16, W. of Chalk River.	605.50	606.31
	Base of C.P.R. rail, opposite B.M. DVI.	604.57	605.37
	On S. end of W. face of culvert, 19.06 miles W. of Chalk River.	606.06	606.85
	Base of C.P.R. rail, opposite B.M. DVI.	593.63	594.47
DVIII.	Centre of overhead crossing, 21.12 miles W. of Chalk River.	588.87	589.67
	On N.W. corner of overhead crossing, 21.12 miles W. of Chalk River.	523.88	524.68
	Base of C.P.R. rail, third crossing E. of Mackey station.	522.05	522.8
	On S.E. corner of trestle over Mackey creek.	472.94	473.76
	Base of C.P.R. rail, centre of trestle over Mackey creek.	443.13	443.94
601	Base of C.P.R. rail, second crossing E. of Mackey station.	442.68	443.50
	Base of C.P.R. rail, opposite Mackey station.	437.06	437.87
	Base of C.P.R. rail, opposite Mackey station.	439.16	439.97
	On rock, close to S. rail, 300 feet S.E. of mile post 25.	431.97	432.78
	C.P.R. bench, N. of track, marked 406.27.	427.53	42.72
DIX.	Ottawa river level, May 30, 1905, opposite B.M. DIX.	427.7	42.72
	Base of C.P.R. rail, opposite B.M. DIX.	399.57	400.42
	Brennan Lake level, May 30, 1905.	421.75	422.60
	Base of C.P.R. rail at Rockliffe station.	417.13	417.98
	On rock, in N. fence line, 100 feet W. of C.P.R. station.	475.88	476.70
DXXI.	Base of C.P.R. rail, at Rockliffe crossing.	474.17	475.02
	C.P.R. bench, S. of track, marked 468.99.	47.46	479.23
	Centre of C.P.R. culvert, marked 29.27 miles.	490.58	491.41
	Base of rail, centre large culvert, marked 29.9 miles.	484.68	485.50
	On S. end of W. wall of large culvert marked 29.89 miles.	465.00	465.82
DXX.	C.P.R. bench, marked (471.11).	461.30	462.25
	Base of C.P.R. rail, opposite B.M. DXX.	493.79	494.65
	On rock, S. of track, 1,300 feet W. of mile post 32.	508.35	509.17
	Base of C.P.R. rail, opposite B.M. 603.	519.00	519.86
	On rock, S. of track, 690 feet E. of culvert, 33.57 miles.	551.16	552.00
603	Base of C.P.R. rail, opposite B.M. DXXII.	552.56	553.43
	On rock, S. of track, 545 feet W. of mile post 34.	563.47	564.30
	C.P.R. bench, S. of track, marked (542.50).	564.04	564.89
	C.P.R. bench, S. of track, marked (584.68).	565.05	565.92
	Base of C.P.R. rail, opposite B.M. DXXVII.	606.92	607.79
DXXVII.	On rock, N. of track, 1,500 feet E. of mile post 37.	603.18	604.02
	Base of C.P.R. rail, crossing E. of Bissett station.	604.65	604.52
	Base of C.P.R. rail, opposite Bissett station.	563.52	564.37
	Base of C.P.R. rail, crossing at Bissett station.	54.65	549.50
	Base of C.P.R. rail, crossing at Bissett station.	547.65	548.49

SESSIONAL PAPER No. 19a

VAUDREUIL to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
DXXV.	Centre of bridge over the Ottawa river, marked 138.48 miles.....	559.41	560.25
601	On rock, at water's edge, foot of hill, ferry to Quebec shore.....	450.64	451.51
	On rock, 400 feet S. of marked, 410 feet S. of road to Ottawa river.....	613.21	611.08
	Base of C.P.R. rail, opposite B.M. 601.....	571.73	572.57
	C.P.R. bench, N. of track, marked 552.59.....	574.77	575.61
DXXVI.	Base of C.P.R. rail, opposite B.M. DXXVI.....	587.90	588.74
	On rock, N. of track, 56 feet W. of mile 39, W. of Chalk River.....	588.37	589.21
	Centre of high trestle, 39.49 miles W. of Chalk River.....	611.19	612.04
	Base of C.P.R. rail, opposite B.M. DXXV.....	646.17	647.01
DXXV.	On rock, N. of track, 440 feet W. of mile 40, W. of Chalk River.....	646.18	647.05
	Centre of C.P.R. culvert, 41.78 miles W. of Chalk River.....	706.02	706.86
	Base of C.P.R. rail, opposite B.M. DXXIV.....	711.11	711.97
DXXIV.	On rock, N. of track, 117 feet E. of mile 42, W. of Chalk River.....	711.37	712.25
	Centre of C.P.R. culvert, 42.13 miles W. of Chalk River.....	711.73	712.58
	Centre of C.P.R. culvert, 42.55 miles W. of Chalk River.....	712.21	713.07
	Centre of C.P.R. culvert, 42.83 miles W. of Chalk River.....	720.65	721.51
	Base of C.P.R. rail, opposite B.M. DXXIII.....	719.85	720.71
DXXIII.	On rock, N. of track, 132 feet E. of mile 41, W. of Chalk River.....	720.60	721.49
	Centre of C.P.R. culvert, 41.19 miles W. of Chalk River.....	721.41	722.26
	Base of C.P.R. rail, opposite B.M. DXXII.....	719.47	720.32
DXXII.	On rock, S. of track, 70 feet W. of mile post 45.....	752.14	753.33
	C.P.R. bench, S. of track, marked 723.73.....	745.53	746.43
	Base of C.P.R. rail, opposite B.M. 602.....	698.31	699.18
602	On rock, S. of track, 345 feet W. of mile 47 from Chalk River.....	698.68	699.58
	Base of C.P.R. rail, opposite B.M. DXXI.....	640.32	641.19
DXXI.	On rock, N. of track, 720 feet W. of mile 48 from Chalk River.....	643.80	644.69
	C.P.R. bench, N. of track, marked 610.64.....	632.55	633.44
	Centre of trestle, 50.37 miles W. of Chalk River station.....	534.23	535.10
	C.P.R. bench, N. of track, marked 492.48.....	514.52	515.42
	Base of C.P.R. rail, opposite Deux Rivières station.....	519.11	519.99
DXXIV.	On rock, foot of cliff, 500 feet below remains of Ranson's house.....	454.44	455.35
605	On rock, mouth of Deux Rivières.....	466.51	467.41
	On rock, 1 mile down Ottawa from B.M. DX.....	471.86	472.77
	On boulder down N. slope back of B.M. DX.....	501.75	502.66
	Base of C.P.R. rail, opposite B.M. DX, Deux Rivières.....	513.32	514.20
DX.	On boulder, 10 feet N. of track, 38 feet E. of mile post 51.....	515.64	516.55
	Base of C.P.R. rail, first crossing W. of Deux Rivières.....	497.93	498.80
DXXII.	On rock, 8 feet N. of track, 51.55 miles W. of Chalk River.....	496.53	497.44
	Base of C.P.R. rail, opposite B.M. DXXII.....	496.58	497.45
DXXIII.	On rock, 8 feet S. of track, 1,270 feet E. of mile 53.....	501.32	502.22
	Base of C.P.R. rail, opposite B.M. DXXIII.....	500.09	500.96
	C.P.R. bench marked 475.69.....	496.87	497.77
	Centre of C.P.R. bridge over brook, marked 54.02 miles.....	497.25	498.11
606	On boulder, 9 feet S. of track, 280 feet E. of mile 55.....	498.82	499.72
	Base of C.P.R. rail, opposite B.M. 606.....	499.30	500.17
	C.P.R. bench marked 487.19.....	507.13	508.03
DXXVI.	On rock, 8 feet S. of track, 180 feet E. of mile 56.....	510.36	511.28
	Base of C.P.R. rail, opposite B.M. DXXVI.....	511.04	511.92
DXXVII.	On rock, 9 feet S. of track, 16 feet W. of mile 57.....	510.43	511.34
	Base of C.P.R. rail, opposite B.M. DXXVII.....	508.40	509.29
DXXVIII.	On boulder, 10 feet S. of track, 525 feet W. of mile 58.....	496.75	497.66
	Base of C.P.R. rail, opposite B.M. DXXVIII.....	497.92	498.80
607	On rock, 20 feet N. of track, 1,800 feet W. of mile 59.....	495.21	496.12
	Base of C.P.R. rail, opposite B.M. 607.....	499.43	500.31
DXXIX.	On boulder, 30 feet S. of track, 125 feet E. of mile 60.....	493.83	494.76
	Base of C.P.R. rail, opposite B.M. DXXIX.....	495.48	496.38
	Centre of C.P.R. bridge over brook, 61.48 miles from Chalk River.....	523.23	524.12
	C.P.R. bench, marked 501.47.....	523.20	524.21
	Base of C.P.R. rail, opposite Kiosk station.....	528.46	529.35
DXXX.	On rock, W. end of Kiosk station platform.....	531.44	532.36
DXXXI.	On boulder, 20 feet S. of track, 445 feet E. of mile 63.....	535.56	536.48
	Base of C.P.R. rail, opposite B.M. DXXXI.....	566.55	567.44
	C.P.R. bench, marked 547.32.....	569.19	570.11
608	On rock, 6 feet N. of track, 485 feet W. of mile 64.....	536.31	537.25
	Base of C.P.R. rail, opposite B.M. 608.....	557.12	558.02
	C.P.R. bench, marked 544.48.....	566.35	567.27
DXXXII.	On rock, S. of track, 135 feet W. of mile 66, from Chalk River.....	568.41	569.34
	Base of C.P.R. rail, opposite B.M. DXXXII.....	567.03	567.94
DXXXIII.	On rock, 8 feet N. of track, 126 feet E. of mile 68.....	568.12	569.05
	Base of C.P.R. rail, opposite B.M. DXXXIII.....	568.25	569.15
609	On rock, 8 feet N. of track, 645 feet W. of mile 69.....	600.73	601.67
	Base of C.P.R. rail, opposite B.M. 609.....	601.17	602.00
DXXXIV.	On rock, 10 feet S. of track, 510 feet E. of mile post 70.....	591.36	592.30
	Base of C.P.R. rail, opposite B.M. DXXXIV.....	589.93	590.84
DXXXV.	On boulder, N. of track, at mile post 70.....	563.59	564.54
	Base of C.P.R. rail, opposite B.M. DXXXV.....	572.32	573.24
DXXXVI.	On boulder, on Ontario shore of Ottawa river, opposite mile 70.....	500.53	501.47

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VAUDREUIL to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
	Centre of C.P.R., overhead crossing of main road.....	569.25	570.17
	Base of C.P.R. rail, first crossing E. of Mattawa station.....	565.24	566.15
DXXXVII.	C.P.R. bench, marked (544.91).....	566.88	567.82
	On flat rock, opposite Mattawa station.....	563.62	564.56
	Base of rail, opposite Mattawa station.....	562.41	563.32
	Centre of C.P.R. trestle over brook and road, marked 73-13.....	555.50	556.42
DXXXVIII.	Base of C.P.R. rail, second crossing W. of Mattawa station.....	563.96	564.89
	On boulder, 25 feet S. of track, 1,130 feet W. of mile post 74.....	594.52	595.48
DXXXIX.	Base of C.P.R. rail, opposite B.M. DXXXVIII.....	594.63	595.55
	On rock, 15 feet S. of track, 485 feet W. of mile post 26.....	630.43	631.38
	Base of C.P.R. rail, opposite B.M. DXXXIX.....	628.43	629.35
610	C.P.R. bench, marked (610.11).....	632.11	633.06
	On rock, 15 feet S. of track, 460 feet E. of mile post 77.....	643.69	644.65
	Base of C.P.R. rail, opposite B.M. 610.....	643.58	644.50
DXL.	On rock, 8 feet N. of track, 505 feet W. of mile post 78.....	682.52	683.48
	Base of C.P.R. rail, opposite B.M. DXL.....	681.05	681.98
	Base of C.P.R. rail, W. end of Calvin siding crossing.....	686.09	687.02
DXLI.	Base of C.P.R. rail, second crossing W. of Calvin siding.....	662.21	663.14
	On rock, 15 feet N. of track, 600 feet E. of mile 80.....	629.03	630.00
	Base of rail, opposite B.M. DXLI.....	628.17	629.11
	Base of rail, centre of culvert, 80.09 miles W. of Chalk River.....	625.18	626.12
	Base of rail, centre of trestle, 80.54 miles W. of Chalk River.....	625.12	626.06
DXLII.	On rock, 8 feet S. of track, 120 feet W. of mile 83.....	624.47	625.40
	Base of C.P.R. rail, opposite B.M. DXLII.....	584.26	585.24
	C.P.R. bench, marked (582.25).....	582.99	583.94
	Centre of bridge over Anable du Fond river, 83.23 miles.....	584.63	585.58
	Base of rail, crossing E. end of Eau Claire siding.....	576.73	577.67
DXLIII.	On rock, 3 feet N. of track, 1,280 feet E. of mile 84.....	588.99	589.94
	Base of C.P.R. rail, opposite B.M. DXLIII.....	590.20	591.18
	C.P.R. bench, marked (565.37).....	590.41	591.39
	Base of C.P.R. rail, opposite B.M. DXLIII.....	591.65	592.63
	Base of C.P.R. rail, opposite Eau Claire station.....	590.44	591.39
DLX.	Base of C.P.R. rail, opposite B.M. DLX.....	591.77	592.72
	On rock, 12 feet N. of track, 1,025 feet E. of mile post 86.....	623.80	624.75
	C.P.R. bench, marked (643.99).....	624.48	625.45
	Centre of C.P.R. trestle, 86.78 miles W. of Chalk River.....	666.11	667.09
DLIX.	Base of C.P.R. rail, opposite B.M. DLIX.....	663.93	664.88
	On rock, 8 feet S. of track, 745 feet E. of mile 87.....	660.36	661.32
	C.P.R. bench, marked (623.28).....	662.58	663.56
	C.P.R. bench, marked (657.37).....	645.74	646.73
	C.P.R. bench, marked (681.94).....	670.82	680.81
	Base of rail, opposite B.M. DLVIII.....	704.40	705.39
DLVIII.	On rock, 8 feet S. of track, 2,800 feet E. of mile post 89.....	702.14	703.10
	Base of C.P.R. rail, opposite B.M. DLVIII.....	703.00	703.99
DLVII.	On rock, 12 feet N. of track, 1,930 feet W. of mile 90.....	756.84	757.80
	Base of C.P.R. rail, first crossing E. of Rutherglen station.....	756.65	757.64
	Base of C.P.R. rail at Rutherglen station.....	785.65	786.62
	Base of C.P.R. rail, first crossing W. of Rutherglen station.....	788.71	789.68
	Centre of C.P.R. long trestle, 91.43 miles W. of Chalk River.....	785.26	786.23
	C.P.R. bench, marked (775.21).....	782.44	783.40
618	Base of C.P.R. rail, opposite B.M. 618.....	799.00	800.00
	On rock, 30 feet N. of track, 320 feet E. of mile post 92.....	800.86	801.82
	Base of C.P.R. rail, third crossing E. of Bonfield station.....	800.75	801.75
	Centre of C.P.R. long trestle.....	778.88	779.85
DLVI.	Base of C.P.R. rail, opposite B.M. DLVI.....	780.61	781.58
	On rock, 8 feet S. of track, 65 feet W. of mile 93.....	783.50	784.47
617	Base of C.P.R. rail, opposite B.M. 617.....	783.50	784.50
	On boulder, 8 feet S. of track, 45 feet W. of mile 94.....	836.38	837.34
	Base of C.P.R. rail, second crossing E. of Bonfield station.....	836.42	837.41
	Base of C.P.R. rail, first crossing E. of Bonfield station.....	842.50	843.47
DLV.	Base of C.P.R. rail, opposite B.M. DLV.....	801.98	802.95
	On rock, 8 feet S. of track, 115 feet E. of mile post 96.....	784.99	785.94
DLIV.	Base of C.P.R. rail, opposite B.M. DLIV.....	784.34	785.34
	On boulder, 15 feet S. of track, 140 feet W. of mile post 98.....	773.97	774.94
	Base of C.P.R. rail, at Bonfield station.....	776.04	777.04
	Centre of C.P.R. bridge over Nashonsing river.....	781.70	782.68
616	Base of C.P.R. rail, opposite B.M. 616.....	786.78	787.76
	On boulder, 25 feet S. of track, 52 feet E. of mile post 99.....	787.51	788.49
	C.P.R. bench, marked (758.77).....	784.81	785.81
	Base of C.P.R. rail, opposite B.M. DLIII.....	782.40	783.48
DLIII.	On rock, 30 feet N. of track, 745 feet E. of mile post 100.....	784.25	785.24
615	Base of C.P.R. rail, opposite B.M. 615.....	782.44	783.45
	On boulder, 12 feet S. of track at mile post 101.....	788.89	789.87
	C.P.R. bench, marked (764.71).....	790.13	791.14
DLII.	Base of C.P.R. rail, opposite B.M. DLII.....	788.38	789.37
	On boulder, 8 feet N. of track, 232 feet W. of mile post 102.....	785.01	785.99
	Base of C.P.R. rail, opposite Nashonsing station.....	785.00	786.00
	C.P.R. bench, marked (762.85).....	784.82	785.80
		786.50	787.50

SESSIONAL PAPER No. 19a

VAUDREUIL to North Bay, &c.—Complete List of Bench Marks, &c.—Concluded.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
	C.P.R. bench, marked 700-67.....	784.67	785.67
	Base of C.P.R. rail, opposite B.M. DLI.....	782.72	783.72
DLI.	On rock, 10 feet N. of track, 1,008 feet E. of mile 103.....	783.82	784.84
	Base of C.P.R. rail, first crossing W. of Nashonsing.....	783.07	784.07
	C.P.R. bench, marked 754-09.....	777.66	778.66
	Base of C.P.R. rail, second crossing W. of Nashonsing.....	774.36	775.36
	Base of C.P.R. rail, opposite B.M. DLI.....	772.52	773.52
DL.	On rock, 8 feet S. of track, 320 feet E. of mile 105.....	773.12	774.14
	Base of C.P.R. rail, opposite B.M. 614.....	769.73	770.72
614	On boulder, 4 feet N. of track, 46 feet E. of mile 106.....	770.06	771.09
	Base of C.P.R. rail, opposite B.M. DLI.....	738.96	739.96
DLIX.	On boulder, 15 feet N. of track, 100 feet W. of mile 107.....	736.79	737.82
	Base of C.P.R. rail, opposite Corbeil crossing.....	733.78	734.79
	Base of C.P.R. rail, opposite Corbeil station.....	733.41	734.42
	C.P.R. bench, marked 699-87.....	723.62	724.62
	Base of C.P.R. rail, opposite B.M. DLI.....	722.45	723.45
DLI.VIII.	On rock, 8 feet N. of track, 163 feet W. of mile 102.....	721.20	722.24
	Base of C.P.R. rail, opposite B.M. 613.....	718.77	719.77
613	On rock, 15 feet S. of track, 125 feet E. of mile post 110.....	717.60	718.63
	C.P.R. bench, marked 696-17.....	720.09	721.13
	Base of C.P.R. rail, opposite B.M. DLI.....	709.38	710.39
DLI.VII.	On rock, 12 feet N. of track, 255 feet E. of mile post 111.....	709.94	710.98
	Base of C.P.R. rail at Thorncliffe station.....	699.38	700.39
	Base of C.P.R. rail, opposite B.M. 612.....	666.29	667.31
612	On rock, 15 feet S. of track, 473 feet E. of mile post 113.....	663.51	664.56
	Base of C.P.R. rail, Nipissing Junction crossing.....	673.63	674.65
	Base of C.P.R. rail, junction of G.P.R. to Toronto.....	671.92	676.25
	Base of C.P.R. rail, second crossing E. of Chippewa creek.....	672.53	673.64
	C.P.R. bench, marked 642-69.....	666.53	667.62
	Base of C.P.R. rail, opposite B.M. DLI.....	664.27	665.32
DLI.VI.	On rock, N. of track, 717 feet W. of mile post 114.....	666.32	667.44
	Base of C.P.R. rail, opposite B.M. 611.....	653.54	654.55
611	On rock, 14 feet S. of track, 95 feet E. of mile 115.....	653.86	654.93
	C.P.R. bench, marked 630-87.....	651.66	652.74
	Base of C.P.R. rail, opposite B.M. DLI.....	649.82	650.81
DLI.V.	On rock, 8 feet N. of track, 280 feet S. of mile post 116.....	651.94	652.99
	Centre of C.P.R. culvert, 116-19 miles W. of Chalk River.....	650.84	651.87
	C.P.R. bench on culvert, 116-19 miles W. of Chalk River (625-65).....	649.49	650.55
	Base of C.P.R. rail, first crossing E. of Chippewa creek.....	651.38	652.37
	Coping, sixth altar step, W. end of S. abutment of Chippewa bridge.....	643.03	644.08
	Coping, fifth altar step, W. end of S. abutment of Chippewa bridge.....	645.03	646.08
	Coping, fourth altar step, W. end of S. abutment of Chippewa bridge.....	647.05	648.10
	Coping, third altar step, W. end of S. abutment of Chippewa bridge.....	649.04	650.09
	Coping, second altar step, W. end of S. abutment of Chippewa bridge.....	650.96	652.01
	Coping, first altar step, W. end of S. abutment of Chippewa bridge.....	652.98	654.03
I.	Centre of C.P.R. bridge over Chippewa creek, North Bay.....	653.00	654.05
	Inside edge coping, fourth altar step, W. end of S. abutment of bridge.....	645.01	646.05
DLI.IV.	On W. end of S. abutment of bridge over Chippewa creek.....	619.66	650.71

7-8 EDWARD VII., A. 1908

**TORONTO TO NORTH BAY VIA NEWMARKET, BARRIE, COLLINGWOOD,
ORILLIA, MIDLAND, GRAVENHURST, BURK'S FALLS AND
NIPISSING JUNCTION.**

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCXIII.	On base, 24 feet from S. end of James St., face of Toronto City Hall.	296.96	296.96
645	S. end of door step (level with basement floor), James St., entrance Toronto City Hall.	296.99	296.99
	On pavement, close to S.W. corner of Government armouries, Toronto.	301.64	301.64
DCXIV.	Street level, intersection of Queen and Simcoe streets, Toronto.	295.66	295.66
	Street level, intersection of King and Simcoe streets, Toronto.	280.16	280.16
6454	On W. face of buttress at S.W. corner of old Union station, Toronto.	255.69	255.69
DCXV.	Top of plinth, fourth small buttress E. of tower, S. side old Union station.	258.62	258.62
	Base of S. rail of track No. 3, opposite exit of old Union station, On W. base of fourth pier from N. abutment of bridge, foot of John street.	254.30	254.30
DCXVI.	Base of S. rail of first track N. of of John street bridge.	251.33	251.33
	1 floor level, centre of John street bridge, Toronto.	252.94	252.94
	Opposite second altar step from ground, N. face E. end of S. abutment, Spadina bridge.	279.69	279.69
DCXVII.	Base of G.T.R. rail under bridge, foot of Spadina avenue.	257.46	257.46
	1 floor level, centre of bridge, foot of Spadina avenue.	254.81	254.81
	Base of G.T.R. rail at level crossing of Spadina avenue.	277.82	277.82
	On E. end of S. face of N. abutment of bridge, foot of Bathurst street.	254.38	254.38
'12'	City Eng. bench, E. face of N. abutment of bridge, foot of Bathurst street.	271.57	271.57
646	Base of G.T.R. rail, under bridge, foot of Bathurst street.	275.04	275.04
	1 floor level, centre of bridge, foot of Bathurst street.	256.19	256.19
	On small boulder, 6 feet from S. face W. end of Queen's wharf, Toronto.	281.09	281.09
	Zero of G.B. ship canal survey automatic gauge, summer of 1906.	251.28	251.28
6454	Zero of Toronto Hbr. Com'rs. gauge on S. face of Queen's wharf.	242.87	242.87
647	Zero of P.W. Dept. automatic gauge on Queen's wharf.	245.00	245.00
	On top of Toronto Hbr. Com'rs. gauge at 4-45 feet.	243.28	243.28
	On S.W. corner of coping at portal of sewer opposite Queen's wharf.	249.45	249.45
	Base of N. rail of G.T.R. main track at Strachan ave., Toronto.	254.44	254.44
	Base of S. rail of C.P.R. main track at Strachan ave., Toronto.	278.36	278.36
DCXVIII.	Street level, intersection of Strachan ave. and Queen street.	279.11	279.11
	Under window, keeper's house, E. entrance, Prov. Insane Asylum.	295.20	295.20
648	Base of W. pillar, keeper's house, E. entrance, Prov. Insane Asylum.	297.64	297.64
DCXIX.	Street level, opposite B.M. 648.	298.04	298.04
649	On W. base, 31.8 feet from rear of Trinity College, Toronto.	296.56	296.56
	On coping, S.E. corner of King street subway.	304.68	304.68
	Base of G.T.R. rail, over centre of King street, Toronto.	293.96	293.96
	Base of G.T.R. rail, opposite N. Parkdale station.	291.89	291.89
	Base of C.P.R. rail, opposite Parkdale station.	304.30	304.30
650	Base of G.T.R. main track, over Queen street.	305.36	305.36
651	On coping of N. wall of Queen St. subway, close to G.T.R. east rail.	306.46	306.46
	On bridge seat, N. wall of Queen St. subway, close to G.T.R. east rail.	306.14	306.14
	Base of C.P.R. rail at Brock ave., Toronto.	302.16	302.16
	Base of G.T.R. rail at Brock ave., Toronto.	317.58	317.58
DCXX.	Base of G.T.R. rail at North Bay line at Brock street.	319.87	319.87
	On base, centre of E. face of W. abutment of bridge, Dundas street.	316.45	316.45
	Base of G.T.R. rail, under Dundas street bridge.	352.94	352.94
	Base of C.P.R. rail, under Dundas street bridge.	350.74	350.74
	1 floor level, centre of Dundas street bridge.	350.59	350.59
'121'	City Eng. bench on W. end of iron truss, W. end of W. side Dundas bridge.	375.00	375.00
	Base of G.T.R. rail, at Bloor street crossing.	377.08	377.08
	Base of C.P.R. rail, at Bloor street crossing.	370.53	370.53
	Base of G.T.R. rail, Royce Avenue crossing.	372.07	372.07
	Base of C.P.R. rail, at Royce Avenue.	380.45	380.45
	Base of G.T.R. rail at crossing of C.P.R. line to N. Toronto.	380.20	380.20
	Base of C.P.R. rail at Toronto Junction station.	396.40	396.40
		304.17	394.17

SESSONAL PAER No. 19a

TORONTO to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	Elevations.	
		Instrumental.	Adjusted.
DCXXI.	On N. stone base, S. end of bridge over Weston road,	396.63	396.63
	Base of C.P.R. rail, under bridge over Weston road,	394.97	394.97
652	Base of C.P.R. rail, Osler Avenue crossing,	396.70	396.70
	On E. end of S. wall of C.P.R. culvert, 18 ft. N. of G.T.R. line to North Bay,	393.87	393.87
	Base of G.T.R. rail, at crossing of G.T.R. line to North Bay,	398.18	398.18
	Base of C.P.R. rail, at crossing of Laurier Avenue,	398.05	398.05
	Base of C.P.R. rail, at crossing of Dufferin Avenue,	399.97	399.97
	Base of C.P.R. rail, at crossing of Bartlett Avenue,	401.65	401.65
653	Base of C.P.R. rail, at crossing of Dufferin Avenue,	402.89	402.89
	On W. end of S. wall of culvert at Ossington Avenue,	409.71	409.71
	Base of C.P.R. rail, at crossing of Ossington Avenue,	402.67	402.67
	Base of C.P.R. rail, at crossing at Spadina street,	402.46	402.46
	Base of C.P.R. rail, at crossing of Bathurst street,	404.92	404.92
	Base of C.P.R. rail, at crossing of Neaport road,	406.47	406.47
	Base of C.P.R. rail, at crossing of Avenue road,	401.31	401.31
654	Base of C.P.R. rail, at crossing of North Toronto station,	403.85	403.85
	On W. end of step, 1st door E. of bay window, North Toronto station,	405.73	405.73
DCXXII.	On base E. face of North Toronto station,	407.26	407.26
	Base of C.P.R. rail, at crossing of Yonge street,	405.51	405.51
	Street level, intersection of Bloor street and Queen's park driveway,	375.83	375.83
DCXXIII.	Pavement centre porch W. entrance of Parliament Buildings,	359.70	359.70
	On base, 28 ft. from front W. face of Parliament Buildings,	359.65	359.65
	Pavement, foot main entrance steps of Parliament Buildings,	359.85	359.85
DCXXIV.	On base, main entrance of Parliament Buildings,	368.82	368.82
	On base between 2nd and 3rd window, N. end of T.T.B. Dept. building,	347.79	347.79
	Street level, intersection of College Avenue and Queen's Park driveway,	333.92	333.92
	Base of G.T.R. rail, at crossing of Paveport road,	412.67	412.67
	Base of G.T.R. rail, at Davenport station,	414.75	414.75
	Base of G.T.R. rail, at crossing of Ste. Claire Avenue,	426.23	426.23
DCXXV.	On S. face of E. end of G.T.R. culvert, at the worsted and wool factory,	432.60	432.60
	Base of G.T.R. rail, opposite B.M. DCXXV,	446.11	446.11
655	Base of G.T.R. rail, under curb and road crossing,	495.67	495.68
	On N. end of E. wall of culvert, 1,500 ft. S. of Downsview station,	547.21	547.22
	Base of G.T.R. rail, opposite B.M. 655,	556.21	556.22
	Base of G.T.R. rail, at Downsview flag station,	576.13	576.14
	Base of G.T.R. rail, at Downsview crossing,	576.78	576.79
DCXXVI.	On N. end of E. wall of culvert, 130 ft. N. of N. end of Downsview siding,	567.82	567.84
	Base of G.T.R. rail, opposite B.M. DCXXVI,	580.07	580.09
	Base of G.T.R. rail, at Downsview flag station,	613.16	613.18
656	Base of G.T.R. rail, at Downsview crossing,	613.95	613.97
	On W. end coping of culvert, 300 ft. S. of road to Laursing,	643.80	643.82
	Base of G.T.R. rail, opposite B.M. 656,	646.71	646.73
	Base of G.T.R. rail, at cross road to Laursing,	644.99	645.01
DCXXVII.	On N. end of E. wall of culvert, 1 mile S. of Elia flag station,	632.26	632.29
	Base of G.T.R. rail, opposite B.M. DCXXVII,	638.75	638.78
657	On N.E. corner of culvert, 1 mile S. of Elia flag station,	638.15	638.18
	Base of G.T.R. rail, opposite B.M. 657,	639.08	639.09
	Base of G.T.R. rail, opposite Elia flag station,	643.76	643.79
658	Base of G.T.R. rail, opposite Elia crossing,	648.49	648.52
	Centre of coping, E. end of culvert, opposite James Brooks' property,	652.33	652.37
	Base of G.T.R. rail, opposite B.M. 658,	662.24	662.28
	Base of G.T.R. rail, at 1st crossing of Vaughan township,	66.87	666.91
DCXXVIII.	On S. inner face of top of W. end of culvert, at Thornhill crossing,	623.82	623.86
659	On S. end of W. wall of culvert, S. of Thornhill crossing,	624.79	624.83
	Base of G.T.R. rail, opposite B.M. 659,	630.77	630.81
	Base of G.T.R. rail, at Thornhill crossing,	629.77	629.78
	Base of G.T.R. rail, at Thornhill station,	630.23	630.23
660	On S. end of E. wall of culvert, 1 mile N. of Thornhill station,	654.87	654.92
	Base of G.T.R. rail, opposite B.M. 660,	663.83	663.88
	Base of G.T.R. rail, 1st crossing N. of Thornhill station,	667.12	667.17
DCXXIX.	On S. end of E. wall of culvert, opposite lot 15, Kefer's property,	712.49	712.54
	Base of G.T.R. rail, opposite B.M. DCXXIX,	716.93	716.98
	Base of G.T.R. rail, at crossing to Carpvile,	724.38	724.43
	Base of G.T.R. rail, at crossing to Maple,	803.00	803.06
	Base of G.T.R. rail, at Maple station,	812.76	812.82
	Base of G.T.R. rail, 1st crossing N. of Maple station,	879.42	879.48
DCXXX.	Base of G.T.R. rail, 2nd crossing N. of Maple station,	891.74	891.80
	On W. face of culvert, 115 ft. N. of mile post 26,	911.85	911.92

7-8 EDWARD VII., A. 1908

TORONTO to North Br., &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	Elevations.	
		Instrumental.	Adjusted.
661	Base of G.T.R. rail, opposite B.M. DCXXX.	934.83	934.90
	Base of G.T.R. rail, 3rd crossing N. of Maple station.	937.30	937.40
	On S. end of E. wall of culvert, opposite lot 31, con. IV, Vaughan township.		
DCXXXI.	Base of G.T.R. rail, opposite B.M. 661.	958.33	958.40
	Base of G.T.R. rail, 4th crossing N. of Maple station.	970.02	970.09
	Base of G.T.R. rail, opposite King station.	980.97	981.05
DCXXXII.	Base of G.T.R. rail, opposite King crossing.	950.48	950.46
	On N. end of W. face of culvert, 1,300 ft. N. of King station.	957.13	957.51
	Base of G.T.R. rail, opposite B.M. DCXXXI.	917.50	917.58
DCXXXIII.	Base of G.T.R. rail, 2nd crossing N. of King station.	963.72	963.80
	Base of G.T.R. rail, 3rd crossing N. of King station.	977.76	977.84
	On S. end of W. wall of culvert, 150 ft. S. of mile 24-203.	970.62	970.70
DCXXXIV.	Base of G.T.R. rail, opposite B.M. DCXXXII.	961.37	961.45
	Base of G.T.R. rail, 4th crossing N. of King station.	976.10	976.18
	On N. end of W. wall of culvert, 1,000 ft. N. of mile 25-202.	969.21	969.30
DCXXXV.	Base of G.T.R. rail, opposite B.M. DCXXXIII.	914.65	914.74
	Base of G.T.R. rail, at crossing of Schomberg railway.	953.44	953.53
	Base of G.T.R. rail, 5th crossing N. of King station.	970.40	970.49
DCXXXVI.	Base of G.T.R. rail, 6th crossing N. of King station.	986.96	987.05
	On W. end of N. wall of culvert, 450 ft. S. of mile 28-199.	1,002.17	1,002.26
	Base of G.T.R. rail, opposite B.M. DCXXXIV.	965.61	965.71
662	Base of G.T.R. rail, 7th crossing N. of King station.	971.01	971.14
	Base of G.T.R. rail, at Yonge street crossing.	935.61	935.74
	On N.E. base of support, at Metropolitan Electric Railway crossing.	932.72	932.82
663	On N.W. base of support, at Metropolitan Electric Railway crossing.	930.75	930.85
	Base of G.T.R. rail, under centre of Metropolitan Railway.	936.75	936.85
	4.7 ft. from S.E. corner of Aurora shoe factory.	929.10	929.20
DCXXXVII.	Base of G.T.R. rail, opposite Aurora station.	881.65	881.76
	Base of G.T.R. rail, at Wellington street crossing.	887.68	887.79
	On W. end of N. wall of culvert, 735 ft. N. of mile 31-196.	882.88	882.99
DCXXXVIII.	Base of G.T.R. rail, opposite B.M. DCXXXVI.	843.61	843.72
	Base of G.T.R. rail, main rail crossing.	850.78	850.89
	On W. end of S. wall of culvert, 1,270 ft. S. of mile 32-195.	831.70	831.81
DCXXXIX.	Base of G.T.R. rail, opposite B.M. DCXXXVII.	807.71	807.83
	On W. end of S. wall of culvert, 2,260 ft. N. of mile 32-195.	818.66	818.78
	Base of G.T.R. rail, opposite B.M. DCXXXVIII.	809.13	809.25
DCXL.	Base of G.T.R. rail, at crossing.	812.50	812.62
	Base of G.T.R. rail, at crossing of Water street.	805.26	805.38
	Base of G.T.R. rail, at crossing of Timothy street.	787.72	787.84
DCXLI.	Centre of G.T.R. bridge, over Holland river at Newmarket.	781.84	781.97
	On E. face of N. abutment of G.T.R. bridge over Holland river.	781.01	781.14
DCXLII.	Base of G.T.R. rail, under overhead crossing, Queen street.	777.28	777.41
	Base of G.T.R. rail, opposite Newmarket station.	773.65	773.78
	Base of G.T.R. rail, 1st crossing N. of Newmarket station.	769.83	769.96
DCXLIII.	Base of G.T.R. rail, 2nd crossing N. of Newmarket station.	770.35	770.48
	Base of G.T.R. rail, 3rd crossing N. of Newmarket station.	766.17	766.30
	Base of G.T.R. rail, under overhead crossing.	762.56	762.69
DCXLIV.	On base of N.E. support of overhead crossing.	761.00	761.14
	Base of G.T.R. rail, 4th crossing S. of Holland Landing station.	761.67	761.81
	Base of G.T.R. rail, opposite B.M. DCXLII.	756.44	756.57
666	On E. face of culvert, 2,150 ft. S. of mile post 38-179.	745.85	745.99
	Base of G.T.R. rail, 3rd crossing S. of Holland Landing station.	740.66	740.80
	Base of G.T.R. rail, 2nd crossing S. of Holland Landing station.	745.59	745.73
666	Base of G.T.R. rail, 1st crossing S. of Holland Landing station.	742.96	743.10
	Base of G.T.R. rail, opposite Holland Landing station.	741.54	741.68
	Brass headed nail on W. side of track, N. side of crossing.	741.56	741.70
DCL.	Base of G.T.R. rail, 7th crossing S. of Bradford station.	738.40	738.54
	Base of G.T.R. rail, 6th crossing S. of Bradford station.	741.19	741.33
	Base of G.T.R. rail, 5th crossing S. of Bradford station.	740.91	741.06
DCLI.	Base of G.T.R. rail, 4th crossing S. of Bradford station.	741.58	741.73
	Base of G.T.R. rail, 3rd crossing S. of Bradford station.	737.73	737.88
	Base of G.T.R. rail, 2nd crossing S. of Bradford station.	734.32	734.47
DCLII.	Base of G.T.R. rail, 1st crossing S. of Bradford station.	737.81	737.96
	Base of G.T.R. rail, centre of bridge over Holland river.	721.40	721.56
	Base of G.T.R. rail, opposite Bradford station.	721.11	721.27
DCLIII.	On W. face of culvert, 570 ft. N. of mile 43-184.	733.25	733.41
	Base of G.T.R. rail, opposite B.M. 666.	726.16	726.32
	On E. end of S. wall, culvert 1,785 ft. N. of mile post 45-182.	737.96	738.13
DCLIV.	Base of G.T.R. rail, 5th crossing S. of Gifford station.	737.04	737.21
	Base of G.T.R. rail, 4th crossing S. of Gifford station.	740.21	740.38
	Base of G.T.R. rail, opposite B.M. DCLII.	742.23	742.41
DCLV.	On W. face of culvert, 990 ft. S. of mile post 46-181.	746.10	746.28
		742.05	742.23

SESSIONAL PAPER No. 19a

TORONTO to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCLL	Base of C.P.R. rail, 3rd crossing S. of Gilford station.	730.52	730.09
	Base of C.P.R. rail, 2nd crossing S. of Gilford station.	735.37	735.55
	Base of C.P.R. rail, opposite B.M. DCLL.	754.51	754.70
	On W. face of culvert, 400 ft. S. of mile post 48-179.	751.24	751.43
	Base of G.T.R. rail, 1st crossing S. of Gilford station.	754.97	755.16
605½	Base of G.T.R. rail, opposite Gilford station.	750.47	750.66
	Base of G.T.R. rail, first crossing N. of Gilford station.	750.31	750.50
	Base of G.T.R. rail, second crossing N. of Gilford station.	750.08	750.27
DCL	Base of G.T.R. rail, opposite B.M. DCL.	720.99	721.18
	On W. face of culvert, 2,485 feet S. of mile post 50-177.	750.73	750.97
	Base of G.T.R. rail, opposite crossing.	747.49	747.68
DCXLIN.	Base of G.T.R. rail, opposite B.M. DCXLIN.	777.78	777.98
	On W. face of culvert, 1,785 feet N. of mile post 50-177.	777.05	777.85
	Base of G.T.R. rail, opposite crossing.	775.02	775.22
DCXLVIII.	Base of G.T.R. rail, opposite B.M. DCXLVIII.	759.62	759.82
	On S. end of W. face of culvert, 980 feet N. of mile 51-176.	759.54	759.74
	Base of G.T.R. rail, opposite Letroy station.	754.84	755.01
DCXLII.	Base of G.T.R. rail, opposite Letroy crossing.	708.80	709.00
	Base of G.T.R. rail, opposite B.M. DCXLII.	704.99	705.19
	On N.E. corner of culvert, 188 feet N. of mile 52-175.	701.78	701.98
605	Base of G.T.R. rail, opposite B.M. 605.	757.50	757.70
	On centre of W. end of culvert, 1,900 feet S. of mile 53-174.	760.63	760.81
	Base of G.T.R. rail, sixth crossing S. of Craiguale station.	763.75	765.96
DCXLVI.	Base of G.T.R. rail, opposite B.M. DCXLVI.	774.58	774.79
	On N. end of E. face of culvert, 2,085 feet S. of mile 54-174.	778.48	778.69
	Base of G.T.R. rail, under overhead crossing.	760.06	760.27
DCXLV.	Base of G.T.R. rail, opp. site B.M. DCXLV.	792.68	792.89
	On N. end of E. face of culvert, 1,815 feet S. of mile 55-172.	819.86	820.07
	Base of G.T.R. rail, fifth crossing S. of Craiguale station.	813.13	813.64
DCXLIV.	Base of G.T.R. rail, fourth crossing S. of Craiguale station.	819.67	819.88
	Base of G.T.R. rail, third crossing S. of Craiguale station.	869.53	869.75
	Base of G.T.R. rail, opposite B.M. DCXLIV.	875.12	875.41
DCXLIII.	On boulder, 6 feet W. of track, 846 feet N. of mile 56-171.	896.27	896.49
	Base of G.T.R. rail, second crossing S. of Craiguale station.	895.31	895.55
	Base of G.T.R. rail, opposite B.M. DCXLIII.	887.04	887.26
601	On N. end of W. face of culvert, 1,200 feet S. of Craiguale station.	876.94	877.17
	Base of G.T.R. rail, at Craiguale station crossing.	866.24	866.47
	Base of G.T.R. rail, at Craiguale station.	877.70	877.93
DCXLI.	Base of G.T.R. rail, first crossing N. of Craiguale station.	879.31	879.54
	Base of G.T.R. rail, second crossing N. of Craiguale station.	875.77	876.00
	Base of G.T.R. rail, opposite B.M. DCXLI.	852.13	852.37
601	On N. end of W. face of culvert, 665 feet S. of mile post 60-167.	846.50	846.74
	Base of G.T.R. rail, opposite B.M. 601.	849.12	849.36
	On N.W. base of overhead crossing, 2,540 feet S. of mile 61-166.	840.18	840.42
DCXLI.	Centre of bridge over Lovers creek.	840.41	840.67
	On W. end of S. abutment of bridge over Lovers creek.	791.83	794.07
	Base of G.T.R. rail, under first overhead crossing.	789.47	789.65
DCXL.	Base of G.T.R. rail, first crossing S. of Allandale station.	782.44	782.68
	Base of G.T.R. rail, opposite Allandale station.	759.21	759.46
	Base of G.T.R. rail, opposite Barrie station.	734.17	734.42
DCXL.	On base, centre of rear wall of Barrie post office.	725.65	725.92
	On N.W. foundation of James Croghan's house, Dundas street.	732.18	732.41
	Base of G.T.R. rail, fourth crossing E. of Colwell Junction.	758.56	758.82
DCXLII.	Base of G.T.R. rail, third crossing E. of Colwell Junction.	766.41	766.58
	Base of G.T.R. rail, second crossing E. of Colwell Junction.	762.21	762.51
	On S. end of W. wall of culvert, 153 feet E. of semaphore, Colwell.	746.98	747.26
DCXLIII.	Base of G.T.R. rail, opposite B.M. DCXLIII.	732.51	732.79
	Base of G.T.R. rail, first crossing E. of Colwell station.	737.58	737.86
	Base of G.T.R. rail, opposite Colwell station.	744.50	744.78
DCXLIII.	Base of G.T.R. rail, first crossing W. of Colwell station.	748.09	748.37
	Base of G.T.R. rail, crossing of C.P.R. to Sudbury.	717.03	717.22
	Base of G.T.R. rail, opposite Utopia station.	703.72	704.01
DCXLIII.	Base of G.T.R. rail, opposite Utopia crossing.	691.15	691.43
	On S. end of E. wall of culvert, 900 feet E. of mile 74-43.	690.58	690.88
	Base of G.T.R. rail, opposite B.M. DCXLIII.	693.86	694.16
DCLIN.	Base of G.T.R. rail, second crossing W. of Utopia station.	658.16	658.46
	On S. face of E. abutment of bridge over Nottawasaga river.	645.74	646.04
	Centre of G.T.R. bridge over Nottawasaga river.	628.83	629.13
DCLIN.	Base of G.T.R. rail, first crossing E. of Angus station.	636.48	636.78
	On S. face of E. abutment of bridge over Pine river.	629.12	629.42
	Centre of G.T.R. bridge over Pine river.	621.28	621.59
DCLIN.	Base of G.T.R. rail, opposite station, Angus.	623.10	623.42
	Base of G.T.R. rail, opposite crossing, Angus.	626.99	627.30
	Base of G.T.R. rail, second crossing W. of Angus station.	625.73	626.04
DCLIN.	Base of G.T.R. rail, third crossing W. of Angus station.	625.69	626.00
	Centre of G.T.R. bridge over Mad river.	634.19	634.50
		627.06	627.37

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TORONTO to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	Elevations.	
		Instrumental.	Adjusted.
DCLXI.	On S. face of W. abutment, bridge over Mad river.....	625.52	625.83
	Base of G.T.R. rail, first crossing E. of Brentwood station.....	624.43	624.74
	Base of G.T.R. rail, opposite Brentwood crossing.....	645.23	645.55
	Base of G.T.R. rail, second crossing W. of Brentwood.....	645.91	646.23
	Base of G.T.R. rail, third crossing W. of Brentwood.....	652.63	652.95
DCLXII.	On S. end of E. face of culvert over Cooks brook.....	666.53	666.85
	Base of G.T.R. rail, opposite B.M. DCLXII.....	670.63	670.96
	Base of G.T.R. rail, New Lowell crossing.....	684.27	684.60
	Base of G.T.R. rail, New Lowell station.....	687.00	687.42
	Base of G.T.R. rail, first crossing W. of New Lowell station.....	705.40	705.73
	Base of G.T.R. rail, second crossing W. of New Lowell station.....	720.07	720.40
	Base of G.T.R. rail, third crossing W. of New Lowell station.....	727.09	727.43
	Base of G.T.R. rail, fourth crossing W. of New Lowell station.....	722.12	722.46
DCLXIII.	On W. face of boulder, 2,590 feet N. of mile post 82-31.....	710.92	711.26
	Base of G.T.R. rail, opposite B.M. DCLXIII.....	714.60	714.94
	Base of G.T.R. rail, fifth crossing W. of New Lowell station.....	715.88	716.22
	Base of G.T.R. rail, sixth crossing W. of New Lowell station.....	711.49	711.84
	Base of G.T.R. rail, seventh crossing W. of New Lowell station.....	710.40	710.75
DCLXIV.	On S. end of E. wall of culvert, 237 feet E. of mile 85-36.....	711.22	711.57
	Base of G.T.R. rail, opposite B.M. DCLXIV.....	700.05	700.40
	Base of G.T.R. rail, first crossing E. of Stayner station.....	711.83	712.18
	Base of G.T.R. rail, opposite Stayner station.....	713.41	713.77
	Base of G.T.R. rail, first crossing W. of Stayner station.....	713.51	713.87
DCLXV.	On S. end of E. wall of culvert, 755 feet W. of mile 86-29.....	713.50	713.86
	Base of G.T.R. rail, opposite B.M. DCLXV.....	702.46	702.82
	Base of G.T.R. rail, second crossing W. of Stayner station.....	711.46	711.82
	Base of G.T.R. rail, third crossing W. of Stayner station.....	713.55	713.91
667	On boulder, 10 feet S. of track, 1,645 feet W. of mile 88-27.....	713.74	714.10
	Base of G.T.R. rail, opposite B.M. 667.....	718.21	718.60
	Base of G.T.R. rail, fourth crossing W. of Stayner station.....	719.03	719.40
	Base of G.T.R. rail, fifth crossing W. of Stayner station.....	719.39	719.76
	Base of G.T.R. rail, sixth crossing W. of Stayner station.....	719.79	720.16
DCLXVI.	On S. face of E. abutment of bridge over Batteaux river.....	699.16	699.54
	Centre of bridge over Batteaux river.....	685.62	686.00
	Base of G.T.R. rail, at Batteaux crossing.....	686.03	686.41
	Base of G.T.R. rail, at Batteaux station.....	615.18	615.56
	Base of G.T.R. rail, first crossing W. of Batteaux station.....	684.23	684.61
	Base of G.T.R. rail, second crossing W. of Batteaux station.....	676.49	676.87
DCLXVII.	On S.E. corner of E. wall of bridge over Pretti river.....	640.62	641.01
	Centre of bridge over Pretti river.....	637.73	638.12
	Base of G.T.R. rail, at Hume street, Collingwood.....	647.69	648.08
	Base of G.T.R. rail, at Ontario street, Collingwood.....	604.72	605.14
DCLXVIII.	On base, front of Collingwood station.....	595.18	595.58
	Base of G.T.R. rail, opposite Collingwood station.....	590.55	590.95
DCLXIX.	On S.E. corner of Collingwood dock pump-house.....	589.32	589.72
668	Iron rivet, N.E. corner of Collingwood dock pump-house.....	584.79	585.19
	Zero of G.B.S.C. Survey automatic gauge, summer of 1906.....	587.40	587.80
	Base of G.T.R. rail at Mulcaster street crossing.....	581.74	581.74
	On timber, W. end of culvert, 2,570 feet E. of mile 64-163.....	722.02	723.18
DCLXX.	On S. face of E. wall of culvert, 360 feet E. of mile 65-162.....	719.11	719.37
	Base of G.T.R. rail, opposite B.M. DCLXX.....	732.57	732.83
DCLXXI.	On S. face of W. abutment of culvert, 625 feet W. of mile 66-161.....	734.47	734.73
	Centre of overhead crossing.....	744.92	745.18
	Base of G.T.R. rail, first crossing W. of Barrie.....	747.64	747.90
DCLXXII.	On N. face of W. wall of culvert, 730 feet E. of mile 67-260.....	758.41	758.67
	Base of G.T.R. rail, opposite B.M. DCLXXII.....	762.32	762.59
	Base of G.T.R. rail, second crossing W. of Barrie.....	771.14	771.41
	Base of G.T.R. rail, third crossing W. of Barrie.....	777.15	777.42
DCLXXIII.	On S. face of E. wall of culvert, 1,760 feet E. of mile 68-159.....	788.46	788.73
	Base of G.T.R. rail, opposite B.M. DCLXXIII.....	789.41	789.68
	Base of G.T.R. rail, opposite Parklands station.....	791.71	791.98
	Base of G.T.R. rail, opposite Parklands crossing.....	799.86	800.13
	Base of G.T.R. rail, second crossing W. of Parklands.....	801.51	801.80
	Base of G.T.R. rail, third crossing W. of Parklands.....	811.38	811.66
	Base of G.T.R. rail, opposite Gowan station.....	817.52	817.80
DCLXXIV.	On N. face of W. wall of culvert, 25 feet E. of mile 70-157.....	817.35	817.63
	Base of G.T.R. rail, opposite B.M. DCLXXIV.....	813.12	813.40
	Base of G.T.R. rail, first crossing W. of Gowan station.....	817.03	817.31
	Base of G.T.R. rail, second crossing W. of Gowan station.....	834.54	834.82
DCLXXV.	On S. end of E. wall of culvert, 720 feet W. of mile 72-155.....	815.52	815.81
	Base of G.T.R. rail, opposite B.M. DCLXXV.....	797.69	797.98
	Base of G.T.R. rail, third crossing W. of Gowan station.....	804.97	805.26
DCLXXVI.	On N. end of W. wall of culvert, 1,095 feet E. of mile 73-154.....	795.04	795.33
	Base of G.T.R. rail, opposite B.M. DCLXXVI.....	773.84	774.13
	Base of G.T.R. rail, fourth crossing W. of Gowan station.....	782.58	782.87
669	On N. end of E. wall of culvert.....	779.22	779.51
		779.15	779.45

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TORONTO to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
	Base of G.T.R. rail, opposite B.M. 669.	780.88	781.18
	Base of G.T.R. rail, at Oro station crossing.	788.88	789.18
	Base of G.T.R. rail at Oro station.	789.01	789.31
DCLXXVII.	On S. end of E. wall of culvert, 2,434 feet W. of mile 76-151.	796.24	796.54
	Base of G.T.R. rail, first crossing W. of Oro station.	800.46	801.16
DCLXXVIII.	Centre of culvert at B.M. DCLXXVII.	797.63	797.94
	On N. end of W. wall of culvert, 1,895 feet W. of mile 77-150.	796.67	796.98
	Centre of culvert at B.M. DCLXXVIII.	799.50	799.81
DCLXXIX.	Base of G.T.R. rail, second crossing W. of Oro station.	795.91	796.22
670	On S. end of W. wall of culvert, 170 feet E. of mile 78-149.	779.09	779.40
671	On S. end of W. wall of culvert, 170 feet E. of mile 78-149.	781.11	781.01
	On S. end of W. wall of culvert, 170 feet E. of mile 78-149.	781.10	781.42
	Centre of culvert, 170 feet E. of mile 78-149.	781.60	781.91
	Base of G.T.R. rail, opposite Hawkestone crossing.	781.11	781.42
	Base of G.T.R. rail, opposite Hawkestone station.	780.12	780.43
	Base of G.T.R. rail, first crossing N. of Hawkestone station.	784.30	784.62
DCLXXX.	Base of G.T.R. rail, second crossing N. of Hawkestone station.	793.47	793.79
	On N. face of E. end of culvert, 1,132 feet W. of mile post 80-147.	791.10	791.42
	Base of G.T.R. rail at B.M. DCLXXX.	796.08	796.40
DCLXXXI.	Base of G.T.R. rail, crossing between Oro and Orillia townships.	815.51	815.84
	On E. end of N. wall of culvert, 1,435 feet N. of mile 82-145.	733.06	733.39
	Base of G.T.R. rail at B.M. DCLXXXI.	737.01	737.34
	Base of G.T.R. rail, third crossing N. of Oro station.	732.48	732.81
DCLXXXII.	Base of G.T.R. rail, fourth crossing N. of Oro station.	723.62	723.96
	On base, 44 feet from W. corner, front of W. wing of Orillia Insane Asylum.	785.68	786.02
	Base of G.T.R. rail, opposite platform of Orillia Insane Asylum.	729.36	729.70
	Base of G.T.R. rail, first crossing N. of platform of Orillia Insane Asylum.	723.88	724.23
	Base of G.T.R. rail, second crossing N. of platform of Orillia Insane Asylum.	721.73	725.08
	Base of G.T.R. rail, third crossing N. of platform of Orillia Insane Asylum.	723.81	721.19
	Base of G.T.R. rail at Front street crossing, Orillia.	724.44	724.79
	Base of G.T.R. rail at Orillia station.	723.46	724.81
673	On W. end of wooden culvert, 450 feet N. of Orillia station.	721.37	721.72
	Base of G.T.R. rail, opposite B.M. 672.	726.34	726.69
	Base of G.T.R. rail, first crossing N. of Orillia station.	731.67	735.02
	Base of G.T.R. rail, second crossing N. of Orillia station.	728.02	728.37
	Base of G.T.R. rail, third crossing N. of Orillia station.	726.49	726.84
674	Centre of G.T.R., over Narrows, Couchiching lake.	726.71	727.06
	On S.E. corner of concrete turntable, Atherley highway bridge.	721.91	722.26
	Centre of highway bridge, Narrows, Lakes Couchiching-Simcoe.	727.08	727.43
	Base of G.T.R. rail at Atherley junction.	725.79	726.14
DCLXXXIII.	On E. end of N. wall of culvert, 162 feet N. of mile post 90-137.	724.68	725.03
675	On E. end of N. wall of culvert, 162 feet N. of mile post 90-137.	727.16	727.51
676	On E. end of N. wall of culvert, 162 feet N. of mile post 90-137.	727.12	727.47
	Base of G.T.R. rail, opposite B.M. DCLXXXIII.	727.42	727.77
	Base of G.T.R. rail, main road crossing.	727.54	727.89
DCLXXXIV.	Base of G.T.R. rail, third crossing S. of Rama station.	730.86	731.21
	On E. end of S. wall, 1,055 feet S. of mile 91-136.	722.53	722.87
	Base of G.T.R. rail, opposite B.M. DCLXXXIV.	725.79	726.13
	Base of G.T.R. rail, second crossing S. of Rama station.	735.73	737.07
DCLXXXV.	On W. end of S. wall of culvert, 775 feet N. of mile 92-135.	733.82	734.16
	Base of G.T.R. rail, opposite B.M. DCLXXXV.	738.13	738.47
677	On W. end of S. wall of culvert, 775 feet N. of mile 92-135.	737.33	737.67
678	On W. end of S. wall of culvert, 775 feet N. of mile 92-135.	737.33	737.67
	Base of G.T.R. rail at Rama station crossing.	739.03	739.37
	Base of G.T.R. rail at Rama station.	739.11	739.45
	Base of G.T.R. rail, first crossing N. of Rama station.	723.11	723.75
DCLXXXVI.	On W. end of S. wall of culvert, 1,735 feet N. of mile 93-134.	719.96	720.30
	Base of G.T.R. rail, opposite B.M. DCLXXXVI.	723.60	723.94
	Base of G.T.R. rail at Longford station.	732.57	732.91
DCLXXXVII.	Base of G.T.R. rail at Longford station crossing.	734.50	734.84
	On rock, 60 feet E. of tracks, opposite mile post 94-133.	729.65	729.99
	Base of G.T.R. rail, opposite B.M. DCLXXXVII.	732.59	732.93
672	On W. end of wooden culvert, 450 feet N. of Orillia station.	722.37	722.72
	Base of G.T.R. rail at Orillia station, branch to Milan I.	725.50	725.85
	Base of G.T.R. rail at Elgin street crossing, Orillia.	724.23	724.58
	Base of G.T.R. rail at Colborne street crossing, Orillia.	725.39	725.74
DCLXXXVIII.	Base of G.T.R. rail at Mississauga street crossing, Orillia.	724.85	725.20
	On N. end of front of Vick's flour mill, Tecumseh street.	731.05	731.40
	Base of G.T.R. rail at Tecumseh St. crossing, Orillia.	729.07	729.42
	Base of G.T.R. rail at Conice street, Orillia.	732.90	733.25
	Base of G.T.R. rail at Jarvis street, Orillia.	736.97	737.32
	Base of G.T.R. rail at Boland street, Orillia.	740.30	740.65
	Base of G.T.R. rail at Cedar street, Orillia.	744.50	744.86

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TORONTO to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
	Base of G.T.R. rail at Ross street, Orillia.....	748.13	748.10
	Base of G.T.R. rail at road crossing, Orillia.....	744.04	744.40
	Base of G.T.R. rail at road crossing, Orillia.....	775.39	775.76
	Base of G.T.R. rail at Silver creek platform.....	745.38	745.75
679	Base of G.T.R. rail at Silver creek, crossing.....	744.80	745.23
	On W. end of N. wall of overhead crossing.....	733.30	733.73
	Centre of overhead crossing, 2,200 feet S. of mile 136-28.....	734.00	735.00
680	Centre of bridge over Silver creek at mile post 136-28.....	720.26	720.64
	On N.W. corner of N. abutment of bridge over Silver creek.....	678.70	679.11
	Centre of bridge over Silver creek.....	682.42	682.80
681	Base of G.T.R. second crossing N. of Silver creek station.....	677.00	677.17
	On rock, 7 feet N. of track, 121 feet S. of mile post 138-20.....	677.22	677.60
DCXXXXIX.	Base of G.T.R. rail at B.M. 681.....	677.18	677.80
	On rock, 7 feet N. of track, 2,105 feet N. of mile 138-20.....	680.00	687.35
	Base of G.T.R. rail at B.M. DCXXXXIX.....	687.44	687.83
682	Base of G.T.R. rail at Uphoff crossing.....	690.11	690.80
	On rock, 12 feet S. of track, 1,065 feet N. of mile 139-25.....	695.33	695.82
	Base of G.T.R. rail at B.M. 682.....	697.71	698.10
DCXC.	Base of G.T.R. rail at Uphoff station.....	698.43	698.82
	On rock, S. of track, 1,465 feet E. of mile 140-24.....	680.84	687.23
	Base of G.T.R. rail at B.M. DCXC.....	685.02	686.31
683	Base of G.T.R. rail, first crossing N. of Uphoff station.....	677.72	678.11
	On N.W. corner of culvert, 600 feet N. of mile 141-23.....	643.05	641.35
DCXCI.	Base of G.T.R. rail at bench 683.....	645.01	645.41
	On rock, 11 feet S. of track, 1,850 feet S. of mile 142-22.....	650.21	659.61
	Base of G.T.R. rail, opposite B.M. DCXCI.....	658.18	658.58
	Base of G.T.R. rail at Foxmead station.....	677.80	678.20
	Base of G.T.R. rail at Foxmead station crossing.....	678.01	678.11
DCXCII.	Base of G.T.R. rail at Foxmead, second crossing.....	668.60	669.06
	On boulder, 23 feet N. of track, 1,085 feet W. of mile 142-22.....	669.85	669.25
684	Base of G.T.R. rail at B.M. DCXCII.....	665.43	665.84
	On boulder, 6 feet W. of track, 1,690 feet N. of mile 143-21.....	655.93	656.31
	Base of G.T.R. rail, opposite B.M. 684.....	655.50	655.01
	Base of G.T.R. rail at Tait station crossing.....	640.51	640.92
DCXCIII.	Base of G.T.R. rail at Tait station.....	636.45	636.86
	On rock, 9 feet N. of track, 1,925 feet E. of mile 145-19.....	632.93	633.35
	Base of G.T.R. rail, opposite B.M. DCXCIII.....	632.30	632.72
	Base of G.T.R. rail, first crossing W. of Tait station.....	621.08	621.50
	Base of G.T.R. rail, crossing of G.T.R. Sudbury line.....	619.35	619.77
685	Base of G.T.R. rail, second crossing W. of Tait station.....	618.37	618.79
	On boulder, 9 feet N. of track, 957 feet W. of mile 146-18.....	607.46	607.88
	Base of G.T.R. rail, opposite B.M. 685.....	608.71	609.13
	Base of G.T.R. rail, second crossing W. of Tait station.....	608.08	609.40
	Base of G.T.R. rail, first crossing E. of Coldwater station.....	589.23	589.72
686	Base of G.T.R. rail, centre of bridge over Coldwater river.....	589.28	589.71
	On N.E. corner of bridge over Coldwater river.....	580.41	580.87
	Base of G.T.R. rail at Coldwater station.....	588.03	588.46
	Base of G.T.R. rail, first crossing W. of Coldwater.....	592.61	593.03
	Base of G.T.R. rail, second crossing W. of Coldwater.....	596.05	597.39
	Base of G.T.R. rail, third crossing W. of Coldwater.....	596.51	596.95
	Base of G.T.R. rail at Fesserton crossing.....	588.40	588.81
687	On E. end of culvert, 4 mile west of Fesserton station.....	588.50	588.94
	Base of G.T.R. rail at B.M. 687.....	587.12	587.53
688	Base of G.T.R. rail at crossing to Carter's saw mill.....	590.01	590.45
	On W. base of chimney of James Carter's saw mill.....	587.88	588.32
	Base of G.T.R. rail, main road crossing, Waulaushene.....	586.27	586.71
	Base of G.T.R. rail at Waulaushene station.....	592.30	592.74
DCXCIV.	On N.E. base of Waulaushene station.....	592.69	593.13
	Street level, intersection of main road and road to wharf.....	593.95	594.00
	Base of G.T.R. rail, French street crossing.....	588.85	589.20
	Base of G.T.R. rail, main road crossing.....	594.45	594.90
DCXCV.	Base of G.T.R. rail, Pine street crossing.....	600.06	601.11
	On W. face of boulder, 26 feet N. of track.....	592.62	593.07
	Base of G.T.R. rail, opposite B.M. DCXCV.....	587.15	587.60
	Base of G.T.R. rail at Tanner's crossing.....	589.89	590.34
	Base of G.T.R. rail at Tanner's station.....	591.25	591.71
	Base of G.T.R. rail at Sturgeons Bay station.....	593.82	594.28
	Base of G.T.R. rail, centre of bridge over Sturgeon river.....	589.01	590.37
	Base of G.T.R. rail under overhead crossing.....	591.79	592.26
	Base of G.T.R. rail at Helen street crossing.....	611.56	612.01
DCXCVI.	Base of G.T.R. rail at John street crossing.....	599.29	599.77
DCXCVI.	On V. base of saw-dust consumer, Victoria Harbour.....	596.19	596.68
DCXCVI.	On N.E. corner of telephone, Victoria Harbour.....	591.57	592.03
	Base of G.T.R. rail at Victoria Harbour station.....	589.24	589.73
689	On E. end of W. abutment of bridge over Hog creek.....	595.04	595.53
DCXCVIII.	On W. end of W. abutment of bridge over Hog creek.....	590.99	591.44
	Centre of bridge over Hog creek.....	587.13	587.63
	Base of G.T.R. rail, first crossing W. of Victoria Harbour.....	594.41	594.91
		595.20	595.70

SESSIONAL PAPER No. 19a

Toronto to North Bay, &c.—Complete List of Bench Marks, &c. Continued.

Bench Marks.	Location and Description.	Elevations.	
		Instrumental.	Adjusted.
	Base of G.T.R. rail, second crossing W. of Victoria Harbour...	597.41	597.91
	Base of G.T.R. rail, third crossing W. of Victoria Harbour...	593.19	593.61
	Base of G.T.R. rail, fourth crossing W. of Victoria Harbour...	599.68	594.19
	Base of G.T.R. rail, fifth crossing W. of Victoria Harbour...	624.26	624.78
600	On W. end of G.T.R. bridge over Mud Lake river	594.19	594.72
	Centre of G.T.R. bridge over Mud Lake river	596.71	597.21
	Base of G.T.R. rail at Old Fort station	598.18	598.71
	Base of G.T.R. rail at Midland station...	593.23	593.79
DCCXC.	On foundation of bay window, Wm. Rogers' house, Bay St	600.19	601.75
DCC.	On Bay street, foundation of Queen's Hotel, Midland...	597.94	598.50
	Base of G.T.R. rail, opposite R.M. DCCXXXVII	732.58	732.93
	Base of G.T.R. rail at crossing...	758.50	758.83
	Base of G.T.R. rail, opposite R.M. DCCXXVII...	758.48	758.81
DCCXXVII.	On rock, 7 feet W. of track, 95 feet S. of centre of crossing...	759.31	759.64
	Base of G.T.R. rail at crossing...	757.62	757.95
702	Base of G.T.R. rail, opposite R.M. 702...	735.30	735.63
	On rock, 10 feet W. of track, 372 feet N. of mile 131-96...	744.67	745.00
	Base of G.T.R. rail, opposite R.M. DCCXXV	723.50	723.81
DCCXXVI.	On rock, 20 feet W. of track, 345 feet N. of mile 130-97...	721.60	721.93
DCCXXV.	Centre of G.T.R. bridge over E. branch of Severn river...	727.83	728.16
	On E. end of N. abutment of bridge over E. branch of Severn river...	721.09	721.42
	Base of G.T.R. rail at crossing of James Bay Ry...	725.21	725.56
	Centre of G.T.R. bridge over E. arm of W. branch of Severn river...	727.65	727.97
DCCXXIV.	On E. end of N. abutment of bridge, E. arm of W. branch of Severn river...	726.24	726.56
	Base of G.T.R. rail, at Washago station...	727.23	727.55
	Base of G.T.R. rail, at Washago crossing...	727.67	727.99
	Centre of G.T.R. bridge over W. branch of Severn river...	730.84	731.16
DCCXXIII.	On W. end of N. abutment of bridge over W. branch of Severn river...	720.15	720.47
	Base of G.T.R. rail, opposite R.M. 701...	732.11	732.43
701	On rock, 13 ft. W. of track, 1,065 N. of mile 127-100...	731.95	732.27
	Base of G.T.R. rail, at Severn station...	727.78	728.10
	Base of G.T.R. rail, centre of bridge over Severn river...	723.99	724.31
DCCXXII	On W. end of N. abutment of bridge over Severn river...	718.55	718.87
	Base of G.T.R. rail, at crossing...	732.60	732.92
	Base of G.T.R. rail, opposite R.M. 700...	735.25	735.57
700	On rock, 14 ft. W. of track, 340 ft. N. of centre of crossing...	735.89	736.21
	Base of G.T.R. rail, at crossing...	749.57	749.89
	Base of G.T.R. rail, at crossing...	741.84	742.16
	Base of G.T.R. rail, opposite R.M. DCCXXI...	730.76	731.08
DCCXXI.	On rock, 5 ft. of track, 2,390 ft. N. of mile 125-102...	731.29	731.61
	Base of G.T.R. rail, at crossing...	731.42	731.74
	Base of G.T.R. rail, at crossing...	727.15	727.48
DCCXX.	On rock, 23 ft. W. of track, 2,190 ft. N. of mile 124-103...	734.62	734.93
	Base of G.T.R. rail, at crossing...	732.03	732.35
DCCXIX.	Centre of G.T.R. bridge over Kashiaboganog river...	719.49	719.80
	On W. end of N. abutment of bridge over Kashiaboganog river...	715.74	716.05
	Base of G.T.R. rail, opposite R.M. DCCXVIII...	719.63	719.94
DCCXVIII.	On rock, 6 ft. W. of track, 1,188 ft. S. of mile 121-107...	720.18	720.49
	Base of G.T.R. rail, opposite R.M. 699...	730.40	730.71
699	On rock, 22 ft. E. of track, 328 ft. N. of mile 121-107...	730.83	731.14
	Base of G.T.R. rail, at 1st crossing S. of Kilworthly station	734.59	734.90
	Base of G.T.R. rail, at Kilworthly station	747.39	747.70
	Base of G.T.R. rail, at Kilworthly crossing...	750.85	751.16
	Base of G.T.R. rail, opposite R.M. DCCXVII...	743.01	743.31
DCCXVII.	On rock, 12 ft. E. of track, 715 ft. S. of mile 120-107...	744.67	744.97
	Base of G.T.R. rail, at crossing...	740.93	741.23
	Base of G.T.R. rail, opposite R.M. DCCXVI...	755.71	756.01
DCCXVI.	On rock, 11 ft. W. of track, 465 ft. N. of mile 119-108...	758.65	758.95
	Base of G.T.R. rail, opposite R.M. DCCXV...	798.57	798.87
DCCXV.	On rock, 34 ft. W. of track, 1,140 ft. S. of mile 118-109...	798.86	799.16
	Base of G.T.R. rail, opposite R.M. DCCXIV...	817.65	817.95
DCCXIV.	On rock, 37 ft. E. of track, 805 ft. S. of mile 117-110...	818.70	819.00
	Base of G.T.R. rail, opposite R.M. DCCXIII...	816.00	816.30
698	On rock, 7.7 ft. W. of track, 2,526 ft. N. of mile 117-110...	817.44	817.74
	Base of G.T.R. rail, opposite R.M. DCCXIII...	837.05	837.34
DCCXIII.	On rock, 6.6 ft. E. of track, 69 ft. S. of mile 116-111...	838.24	838.53
DCCXII.	On rock at Dymont's wharf, 225 ft. W. of Muskoka wharf...	746.03	746.32
	Base of G.T.R. rail, at Muskoka wharf station...	743.75	744.05
	Base of G.T.R. rail, crossing, branch to Muskoka wharf...	751.07	751.36
	Base of G.T.R. rail, opposite Gravenhurst station...	815.06	815.35
	Base of G.T.R. rail, opposite R.M. DCCXI...	818.62	818.91
DCCXI.	On rock, 36 ft. E. of track, 360 ft. N. of Gravenhurst station	817.96	818.25
	Base of G.T.R. rail, at crossing of Muskoka rail...	829.96	829.96

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TORONTO to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
	Base of G.T.R. rail, at crossing of James street.	832.11	832.40
	Base of G.T.R. rail, at crossing of Philip and Royal streets.	836.18	836.47
	Base of G.T.R. rail, at crossing of Brock street.	839.03	839.32
	Base of G.T.R. rail, at crossing of Church street.	834.35	834.64
	Base of G.T.R. rail, at crossing.	826.90	827.19
697	On rock, 21 ft. W. of track, 495 ft. S. of mile 114-113.	827.11	827.40
	Base of G.T.R. rail, over creek.	825.34	825.63
	Base of G.T.R. rail, over road.	812.27	812.56
DCCX.	Base of G.T.R. rail, opposite B.M. DCCX.	812.31	812.60
	On W. end of N. abutment of overhead crossing at road and creek.	812.28	812.57
	Base of G.T.R. rail, at crossing.	810.74	811.03
	Base of G.T.R. rail, opposite B.M. 696.	826.11	826.40
696	On rock, 17 ft. W. of track, 1,120 ft. N. of mile 113-114.	828.37	828.66
DCCIX.	Base of G.T.R. rail, opposite B.M. DCCIX.	827.98	828.27
	On rock, 84 ft. E. of track, 1,980 ft. S. of mile 112-113.	849.95	850.24
	Base of G.T.R. rail, at crossing.	830.12	830.41
695	Base of G.T.R. rail, opposite B.M. 695.	808.89	809.17
	On rock, 28 ft. W. of track, 260 ft. S. of mile 111-116.	884.07	884.35
	Base of G.T.R. rail, at crossing.	883.56	883.84
694	Base of G.T.R. rail, opposite B.M. 694.	807.88	808.16
	On rock, 29 ft. W. of track, 2,035 ft. S. of mile 110-117.	903.91	904.21
DCCVIII.	Base of G.T.R. rail, opposite B.M. DCCVIII.	900.85	901.13
	On rock, 9 ft. W. of track, 2,060 ft. S. of post 109-118.	901.29	901.57
DCCVII.	Base of G.T.R. rail, opposite B.M. DCCVII.	903.29	903.54
	On boulder, 46 ft. E. of track, 1,515 ft. S. of mile 108-119.	805.82	806.10
	Base of G.T.R. rail, at crossing.	804.82	805.10
693	Base of G.T.R. rail, opposite B.M. 693.	879.09	880.26
	On rock, 23 ft. E. of track, 2,450 ft. N. of mile 108-119.	860.84	861.11
DCCVI.	Base of G.T.R. rail, opposite B.M. DCCVI.	804.00	804.27
	On E. end of S. abutment of bridge, S. branch Muskoka river.	801.85	802.12
	Base of G.T.R. rail, centre of bridge, S. branch Muskoka river.	797.02	797.29
	Base of G.T.R. rail, at main road crossing.	801.89	802.16
DCCV.	Base of G.T.R. rail, opposite B.M. DCCV.	813.75	814.02
	On W. face of S. abutment of G.T.R. bridge over Muskoka river.	816.54	816.81
	Centre of G.T.R. bridge over Muskoka river.	811.00	812.26
DCCIV.	Base of G.T.R. rail, at B.M. DCCIV.	816.61	816.90
	Base of G.T.R. rail, at Manitoba street, Bracebridge.	815.61	815.91
	On rock, 9.6 ft. E. of track, 40 ft. N. of centre of Manitoba street.	815.93	816.20
	Centre of highway bridge over Muskoka river at Thomas street.	817.56	817.83
692	On S. end of W. abutment of bridge at Thomas street.	811.34	811.61
	Base of G.T.R. rail, opposite Thomas street crossing.	807.78	808.05
	Base of G.T.R. rail, opposite Bracebridge station.	810.61	810.88
	Base of G.T.R. rail, 1st crossing N. of Bracebridge station.	812.26	812.53
691	Base of G.T.R. rail, opposite B.M. DCCIV.	821.82	822.09
	On rock, 24 ft. W. of track, 414 ft. N. of mile post 104-123.	850.50	850.76
DCCIII.	Base of G.T.R. rail, at B.M. DCCIII.	851.14	851.40
	On E. face of culvert, 1,180 ft. S. of mile 103-124.	885.73	885.99
	Base of G.T.R. rail, 4th crossing S. of Falkenburg station.	870.00	870.35
	Base of G.T.R. rail, 3rd crossing S. of Falkenburg station.	919.03	919.29
	Base of G.T.R. rail, 2nd crossing S. of Falkenburg station.	923.61	923.87
DCCII.	Base of G.T.R. rail, opposite B.M. DCCII.	931.37	931.63
	On rock, 10 ft. E. of track, 900 ft. N. of mile 101-126.	911.83	912.09
	Base of G.T.R. rail, Falkenburg station crossing.	941.67	941.93
	Base of G.T.R. rail, Falkenburg station.	952.02	952.32
DCCI.	Base of G.T.R. rail, opposite B.M. DCCI.	952.25	952.51
	On flat rock, 21 ft. W. of track, 213 ft. S. of mile 100-127.	954.09	954.35
DCCXXVIII.	Base of G.T.R. rail, opposite B.M. DCCXXVIII.	951.89	952.15
	On rock, 11 ft. E. of track, 2,390 ft. N. of mile 127-100.	951.08	951.35
	Base of G.T.R. rail, opposite B.M. DCCXXVIII.	955.24	955.49
DCCXXIX.	Base of G.T.R. rail, at crossing.	954.79	955.04
	On W. face of culvert, 2,407 ft. N. of mile 128-99.	970.35	970.60
DCCXXX.	Base of G.T.R. rail, opposite B.M. DCCXXX.	983.59	983.81
	On rock, 9 ft. W. of track, 61.9 ft. S. of mile 130-97.	988.18	988.43
	Base of G.T.R. rail, opposite B.M. DCCXXX.	1,008.13	1,008.38
	Base of G.T.R. rail, at crossing.	1,014.71	1,014.96
DCCXXXI.	Base of G.T.R. rail, at crossing.	1,044.23	1,044.48
	On rock, E. side of track, 1,700 ft. N. of mile post 131-96.	1,009.30	1,009.55
DCCXXXII.	Base of G.T.R. rail, opposite B.M. DCCXXXII.	1,021.94	1,022.19
	On rock, 9 ft. W. of track, 1,230 ft. N. of mile 132-95.	1,024.70	1,024.94
703	Base of G.T.R. rail, opposite B.M. DCCXXXII.	1,021.11	1,021.35
	On W. face of culvert, 2,565 ft. S. of mile 133-94.	1,005.96	1,006.20
		1,005.70	1,005.94
		986.64	986.88

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TORONTO to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
	Base of G.T.R. rail, opposite B.M. 703.....	993.01	993.25
	Base of G.T.R. rail, at crossing.....	1,013.19	1,013.43
	Base of G.T.R. rail, at crossing.....	1,038.88	1,039.12
	Base of G.T.R. rail, at crossing.....	1,022.46	1,022.70
	Base of G.T.R. rail, at crossing.....	1,027.05	1,027.19
DCCXXXIII.	On rock, 35 ft. W. of track, 357 ft. S. of mile 135-02.....	1,030.62	1,030.86
	Base of G.T.R. rail, opposite B.M. DCCXXXIII.....	1,035.07	1,035.00
	Base of G.T.R. rail, at Utterson station.....	1,030.06	1,030.20
DCCXXXIV.	Base of G.T.R. rail, at Utterson station crossing.....	1,037.57	1,037.80
	On rock, 8.7 ft. E. of track, 140 ft. N. of Utterson crossing.....	1,035.73	1,035.96
DCCXXXV.	Base of G.T.R. rail, opposite B.M. DCCXXXIV.....	1,048.70	1,048.93
	On rock, 9 ft. E. of track, 2,070 ft. N. of mile post 136-91.....	1,045.49	1,045.72
DCCXXXVI.	Base of G.T.R. rail, opposite B.M. DCCXXXV.....	1,002.31	1,002.54
	On rock, 7 ft. W. of track, 1,500 ft. N. of mile 137-90.....	1,001.31	1,001.54
	Base of G.T.R. rail, opposite B.M. DCCXXXVI.....	995.79	996.02
704	Base of G.T.R. rail, at crossing.....	977.54	977.77
	On boulder, 17 ft. W. of track, 134 ft. S. of mile 138-89.....	976.84	977.07
	Base of G.T.R. rail, opposite B.M. 704.....	974.18	974.41
	Base of G.T.R. rail, at crossing.....	969.30	969.62
	Base of G.T.R. rail, at crossing.....	964.72	964.95
	Base of G.T.R. rail, centre of bridge over creek.....	961.67	961.90
705	Base of G.T.R. rail, at crossing.....	961.05	961.27
	Under E. rail, N. end of bridge over creek.....	967.00	967.22
	Centre of G.T.R., wooden bridge over creek.....	967.08	967.30
DCCXXXVII.	On S. end of W. face of culvert, 780 ft. S. of mile 140-87.....	974.78	975.00
	Base of G.T.R. rail, opposite B.M. DCCXXXVII.....	986.44	986.66
	Base of G.T.R. rail, at crossing.....	1,017.21	1,017.43
DCCXXXVIII.	On rock, 40 ft. E. of track, 173 ft. S. of mile 142-85.....	1,025.04	1,025.26
	Base of G.T.R. rail, opposite B.M. DCCXXXVIII.....	1,028.65	1,028.77
	On base of G.T.R. rail, at crossing.....	1,002.53	1,002.75
706	On boulder, 48 ft. E. of track, 1,300 ft. N. of mile 143-84.....	976.74	976.95
	Base of G.T.R. rail, opposite B.M. 706.....	979.36	979.57
	Base of G.T.R. rail, at crossing.....	975.05	975.26
707	On boulder, 9 ft. E. of track, 575 ft. S. of mile 144-83.....	979.40	979.61
	Base of G.T.R. rail, opposite B.M. 707.....	979.11	979.32
	Base of G.T.R. rail, at crossing.....	916.86	916.07
	Base of G.T.R. rail, at crossing.....	916.08	916.29
DCCXXXIX.	On rock, 17 ft. E. of track, 1,725 ft. S. of mile 146-81.....	951.82	951.93
	Base of G.T.R. rail, opposite B.M. DCCXXXIX.....	950.17	950.48
	Base of G.T.R. rail, at crossing, Huntsville.....	951.06	951.27
	Base of G.T.R. rail, at crossing, Huntsville.....	951.23	951.44
DCCXL.	On W. face of S. abutment of bridge over Vernon river.....	964.71	964.92
	Centre of G.T.R. bridge over Vernon river.....	965.57	965.78
	Base of G.T.R. rail, under centre of overhead crossing.....	969.37	969.58
DCCXLI.	Base of G.T.R. rail, at crossing.....	981.80	982.09
	On rock, 10 feet W. of track at mile 148-79.....	996.10	996.30
	Base of G.T.R. rail, opposite B.M. DCCXLI.....	994.75	994.95
	Base of G.T.R. rail, at crossing.....	946.18	946.38
	Base of G.T.R. rail, at crossing.....	947.16	947.36
DCCXLII.	On E. end of S. abutment of bridge over Big East river.....	954.10	954.30
	Centre of G.T.R. bridge over Big East river.....	957.08	957.28
DCCXLIII.	On W. end of S. wall of culvert, marked 2000.....	960.92	961.11
	Base of G.T.R. rail, opposite B.M. DCCXLIII.....	996.81	997.00
	Base of G.T.R. rail, at crossing.....	997.52	997.71
	Base of G.T.R. rail, at crossing.....	1,045.24	1,045.43
DCCXLIV.	On E. face of S. abutment of trestle over Little East river.....	1,041.35	1,041.54
	Centre of trestle over Little East river.....	1,044.39	1,044.58
	Base of G.T.R. rail, at crossing.....	1,052.00	1,052.18
708	On centre of N. wall of cattle guard, N. side of crossing.....	1,051.62	1,051.84
	Base of G.T.R. rail at B.M. 708.....	1,052.00	1,052.19
	Base of G.T.R. rail at Novar crossing.....	1,070.72	1,070.90
	Base of G.T.R. rail at Novar station.....	1,070.37	1,070.55
709	On W. end of N. wall of culvert, 495 feet S. of mile 150-74.....	1,065.86	1,066.05
	Base of G.T.R. rail, opposite B.M. 709.....	1,069.51	1,069.69
710	On E. end of N. wall of culvert, 1,335 feet S. of mile 157-70.....	1,069.35	1,069.53
	Base of G.T.R. rail, opposite B.M. 710.....	1,072.40	1,072.58
711	On E. end of S. wall of culvert, 433 feet N. of mile 158-69.....	1,073.90	1,074.08
	Base of G.T.R. rail, opposite B.M. 711.....	1,076.74	1,076.92
DCCXLV.	On rock, 9 feet E. of track, 2,065 feet N. of mile 159-68.....	1,119.54	1,119.71
	Base of G.T.R. rail, opposite B.M. DCCXLV.....	1,119.56	1,119.73
	Base of G.T.R. rail, under centre of overhead crossing.....	1,122.84	1,123.01
DCCXLVI.	On rock, 10 feet E. of track, 117 feet N. of overhead crossing.....	1,122.38	1,122.55
	Base of G.T.R. rail, opposite B.M. DCCXLVI.....	1,120.84	1,121.01
DCCXLVII.	On rock, 14 feet E. of track, 160 feet N. of black-white semaphore, Scotia Junction.....	1,087.40	1,087.57
	Base of G.T.R. rail, opposite B.M. DCCXLVII.....	1,084.05	1,084.22
	Base of G.T.R. rail, Scotia Junction.....	1,081.76	1,081.93
	Base of G.T.R. rail, at crossing.....	1,082.83	1,083.00
	Base of G.T.R. rail opposite B.M. DCCXLVII.....	1,082.42	1,082.59

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TORONTO to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCCLXXI.	On rock, 7 feet E. of track, 155 feet N. of semaphore	1,082.82	1,082.00
	Base of G.T.R. rail, centre of bridge over Ragged creek	1,080.71	1,080.88
DCCLXX.	Base of G.T.R. rail at Elmisdale crossing	1,039.24	1,039.41
	On rock, 70 feet W. of track, 23 feet S. of Elmisdale station	1,039.88	1,039.05
DCCLXIX.	Base of G.T.R. rail, at Elmisdale station	1,038.47	1,038.61
	On W. end of S. wall of culvert, 1,305 feet N. of mile 63-164	1,025.42	1,025.58
	Centre of G.T.R. culvert over brook	1,031.53	1,031.69
	Base of G.T.R. rail at crossing	1,034.48	1,034.64
DCCLXVIII.	Base of G.T.R. rail opposite B.M. DCCLXVIII	1,024.40	1,024.56
	On rock, 8 feet W. of track, 1,150 feet S. of mile 62-165	1,023.62	1,023.78
DCCLXVII.	Centre of G.T.R. bridge over S. branch of Magnetawan river	983.73	983.89
	On E. face of N. abutment of bridge over Magnetawan river	981.23	981.39
	Base of G.T.R. rail at Katrine station crossing	983.53	983.69
	Base of G.T.R. rail at Katrine station	983.45	983.61
DCCLXVI.	Base of G.T.R. rail opposite B.M. DCCLXVI	982.79	982.94
	On rock, 9 feet E. of track, 490 feet S. of mile 50-168	983.85	984.00
DCCLXV.	Centre of G.T.R. bridge over S. branch of Magnetawan river	976.97	977.12
	On W. face of N. abutment of bridge over Magnetawan river	975.08	975.83
	Base of G.T.R. rail at crossing	983.80	984.04
DCCLXIII.	Centre of G.T.R. bridge over S. branch of Magnetawan river	969.96	970.11
	On E. face of N. abutment of bridge over S. branch of Magnetawan river		
	Base of G.T.R. rail at crossing	966.63	966.78
	Base of G.T.R. rail at Burk's Falls station	975.41	975.55
	Base of G.T.R. rail at Magnetawan wharf station	970.57	970.71
718	Level of S.E. corner of Magnetawan river wharf	939.66	939.80
	On rock, 34 feet S. of track, 39 feet off Magnetawan river wharf	932.06	932.20
	Centre of G.T.R. bridge over Burk's Falls	933.52	933.66
DCCLXIV.	Base of G.T.R. rail opposite B.M. DCCLXIV	953.97	954.11
	On rock, 74 feet W. of track, to sawmills, Burk's Falls	956.01	956.15
	Crest of dam, head of Burk's Falls	958.80	958.94
	Centre of highway bridge, foot of main street, Burk's Falls	956.33	956.47
	Base of G.T.R. rail, foot of main street, Burk's Falls	962.97	963.11
	Centre of G.T.R. bridge, over S. branch of Magnetawan river	964.00	964.14
DCCLXII.	Centre of G.T.R. bridge, over N. branch of Magnetawan river	969.89	970.03
	On W. face of N. abutment of bridge, over N. branch of Magnetawan river	982.97	983.10
	Base of G.T.R. rail at crossing	978.57	978.71
DCCLXI.	Base of G.T.R. rail, opposite B.M. DCCLXI	1,009.07	1,010.11
	On rock, 9 feet W. of track, 237 feet N. of mile 54-173	1,021.29	1,021.43
DCCLX.	Base of G.T.R. rail, opposite B.M. DCCLX	1,023.82	1,023.96
	On rock, 10 feet W. of track, 300 feet S. of mile 53-174	1,064.37	1,064.51
DCCLIX.	Base of G.T.R. rail, opposite B.M. DCCLIX	1,064.31	1,064.45
	On S. end of E. face of culvert, 2,326 feet N. of mile 53-174	1,056.47	1,056.61
	Base of G.T.R. rail at Berrydale crossing	1,041.89	1,042.03
DCCLVIII.	Base of G.T.R. rail opposite B.M. DCCLVIII	1,058.26	1,058.40
	On rock, 114 feet W. of track, 584 feet S. of mile 51-170	1,133.10	1,133.23
	Base of G.T.R. rail at crossing	1,132.84	1,132.97
DCCLVII.	Base of G.T.R. rail opposite B.M. DCCLVII	1,135.27	1,135.40
	On boulder, 29 feet W. of track, 288 feet N. of mile 50-177	1,108.38	1,108.51
	Base of G.T.R. rail at crossing	1,102.10	1,102.23
717	On boulder, 25 feet W. of track, 105 feet S. of mile 49-178	1,091.32	1,091.45
DCCLVI.	Base of G.T.R. rail opposite B.M. DCCLVI	1,089.72	1,089.85
	On rock, 74 feet W. of track, 1,106 feet S. of mile 48-179	1,090.36	1,090.49
	Centre of G.T.R. wooden bridge over Stony creek	1,103.11	1,103.24
716	On E. side of S. end of wooden bridge over Stony creek	1,102.19	1,102.32
	Base of G.T.R. rail, opposite B.M. 715	1,090.05	1,090.18
715	On rock, 6 feet E. of track, 188 feet N. of mile 47-180	1,087.20	1,087.33
	Base of G.T.R. rail at crossing	1,110.53	1,110.65
DCCLV.	Base of G.T.R. rail opposite B.M. DCCLV	1,099.66	1,099.78
	On rock, 18 feet W. of track, 435 feet N. of mile 46-181	1,100.40	1,100.52
714	Base of G.T.R. rail opposite B.M. 714	1,096.05	1,096.17
	On W. end of N. wall of culvert, 345 feet N. of mile 45-182	1,094.57	1,094.69
	Base of G.T.R. rail at road crossing	1,095.51	1,095.66
	Base of G.T.R. rail at crossing of street	1,090.47	1,090.59
713	Base of G.T.R. rail at crossing of street	1,094.25	1,094.37
	Base of G.T.R. rail opposite B.M. 713	1,098.88	1,099.00
	On W. end of N. wall of cattle guard, 250 feet S. of mile 44-183	1,099.13	1,099.25
	Base of G.T.R. rail at crossing of street	1,095.52	1,095.64
	Base of G.T.R. rail at Sundridge station crossing	1,098.93	1,099.05
	Base of G.T.R. rail at Sundridge station	1,099.66	1,099.77
	Base of G.T.R. rail at crossing	1,099.88	1,099.99
DCCLIV.	Base of G.T.R. rail opposite B.M. DCCLIV	1,109.61	1,109.72
	On S. end of W. face of culvert, 356 feet S. of mile 43-184	1,118.98	1,119.09
	Base of G.T.R. rail at crossing	1,114.04	1,114.15
	Base of G.T.R. rail at crossing	1,119.43	1,119.54
DCCLIII.	Base of G.T.R. rail opposite B.M. DCCLIII	1,128.12	1,128.23
	On rock, 11 feet W. of track, 215 feet S. of mile 42-185	1,140.89	1,140.90
	Base of G.T.R. rail opposite B.M. DCCLII	1,147.94	1,148.05
		1,160.18	1,160.29

SESSIONAL PAPER No. 19a

TORONTO to North Bay, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCCLII.	On boulder, 41 feet W. of track, 2,380 feet S. of mile 41-186.	1,158.86	1,158.97
	Base of G.T.R. rail at crossing.....	1,186.31	1,186.42
	Base of G.T.R. rail at crossing.....	1,173.18	1,173.29
	Base of G.T.R. rail at crossing.....	1,155.20	1,155.30
	Base of G.T.R. rail opposite B.M. 712.	1,158.19	1,158.29
712	On boulder, 14 feet E. of track, 400 feet S. of semaphore	1,157.07	1,157.17
	Base of G.T.R. rail at South River station.....	1,157.87	1,157.97
	Base of G.T.R. rail at South River station crossing.....	1,157.78	1,157.88
	Base of G.T.R. rail opposite B.M. DCCLII.	1,156.33	1,156.43
DCCLII.	On rock, 8 feet W. of track, 180 feet N. of semaphore	1,156.75	1,156.85
	Centre of G.T.R. bridge over South river.....	1,156.88	1,156.98
DCCL.	On E. end of N. abutment of bridge over South river.....	1,152.95	1,153.05
	Base of G.T.R. rail opposite B.M. DCCLIX.	1,152.57	1,152.67
DCCLIX.	On rock, 11 feet W. of track, 518 feet N. of mile 37-190.	1,152.75	1,152.85
	Base of G.T.R. rail opposite B.M. DCCLIX.	1,184.07	1,184.17
DCCLXVIII.	On rock, 11 feet E. of track, 31 feet S. of mile 36-121.	1,185.11	1,185.21
	Base of G.T.R. rail opposite B.M. DCCLXVIII.	1,184.08	1,184.17
	Base of G.T.R. rail at crossing.....	1,195.16	1,195.26
DCCLXXII.	On rock, 9 feet E. of track, 158 feet S. of mile 35-192.	1,194.77	1,194.86
	Base of G.T.R. rail opposite B.M. DCCLXXII.	1,195.27	1,195.36
719	On boulder, 16 feet W. of track, 62 feet N. of mile 34-193.	1,194.83	1,194.92
	Base of track, opposite B.M. 719.	1,194.10	1,194.19
DCCLXXIII.	On rock, 16 feet W. of track, 2,080 feet S. of mile 33-191.	1,192.31	1,192.43
	Base of G.T.R. rail opposite B.M. DCCLXXIII.	1,193.84	1,193.93
	Base of G.T.R. rail at gravel pit crossing.....	1,190.05	1,190.14
	Base of G.T.R. rail, centre of high trestle over gully.....	1,175.69	1,175.78
DCCLXXIV.	On rock, 10 feet W. of track, at mile post 33-194.	1,176.97	1,177.06
	Base of G.T.R. rail opposite B.M. DCCLXXIV.	1,174.65	1,174.74
DCCLXXV.	On rock, 10 feet E. of track, 174 feet S. of mile post 32-195.	1,150.32	1,150.41
	Base of G.T.R. rail opposite B.M. DCCLXXV.	1,148.17	1,148.26
DCCLXXVI.	On boulder, 12 feet W. of track, 305 feet S. of mile 31-196.	1,105.61	1,105.69
	Base of G.T.R. rail opposite B.M. DCCLXXVI.	1,104.24	1,104.32
720	On boulder, 16 feet E. of track at mile post 30-197.	1,053.76	1,053.84
	Base of G.T.R. rail opposite B.M. 720.	1,054.88	1,054.96
721	On W. end of N. abutment of bridge, 480 feet S. of mile 29-198.	1,030.93	1,031.01
	Base of G.T.R. rail, centre of bridge, 480 feet S. of mile 29-198.	1,033.19	1,033.27
722	On boulder, 14 feet W. of track, 106 feet S. of mile 28-197.	1,025.87	1,025.95
	Base of G.T.R. rail opposite B.M. 722.	1,029.23	1,029.31
	Base of G.T.R. rail, centre of bridge over South river.....	1,026.05	1,026.12
723	On S. base support of G.T.R. tank, Trout creek.....	1,027.30	1,027.37
	Base of G.T.R. rail opposite B.M. 723.	1,026.35	1,026.42
	Base of G.T.R. rail at Trout creek station.....	1,026.80	1,026.87
	Base of G.T.R. rail at Trout creek station crossing.....	1,027.38	1,027.45
DCCLXXVII.	On boulder, 13 feet W. of track, 240 feet N. of mile 25-202.	1,039.36	1,039.43
	Base of G.T.R. rail opposite B.M. DCCLXXVII.	1,039.24	1,039.31
DCCLXXVIII.	On rock, 74 feet E. of track, 475 feet N. of mile post 24-203.	1,024.39	1,024.45
	Base of G.T.R. rail opposite B.M. DCCLXXVIII.	1,024.72	1,024.78
	Base of G.T.R. rail at crossing.....	977.71	977.77
DCCLXXIX.	On rock, 8 feet E. of track, 884 feet N. of mile 23-204.	974.62	974.68
	Base of G.T.R. rail opposite B.M. DCCLXXIX.	974.13	974.19
DCCLXXX.	On rock, 54 feet E. of track, 615 feet S. of mile 22-205.	934.57	934.63
	Base of G.T.R. rail opposite B.M. DCCLXXX.	934.72	934.78
724	On boulder, 74 feet E. of track, at mile 22-205.	928.21	928.27
	Base of G.T.R. rail opposite B.M. 724.	928.60	928.66
	Base of G.T.R. rail at crossing.....	908.71	908.77
	Base of G.T.R. rail, centre of bridge over brook.....	881.34	881.40
	Base of G.T.R. rail at crossing.....	885.66	885.72
	Base of G.T.R. rail at Poyassan station.....	855.41	855.47
	Base of G.T.R. rail, overhead crossing of street.....	856.07	856.12
	Base of G.T.R. rail, overhead crossing of McGuinness' brook	856.10	856.15
DCCLXXXI.	On E. face of N. abutment of bridge over McGuinness' brook	852.21	852.26
	Base of G.T.R. rail at crossing.....	858.88	858.93
725	On boulder, 25 feet E. of track, 1,110 feet S. of mile 18-209.	872.38	872.43
	Base of G.T.R. rail opposite B.M. 725	873.41	873.46
	Centre of G.T.R. trestle over brook.....	867.32	867.37
	Base of G.T.R. rail at crossing.....	870.36	870.41
726	On boulder, 74 feet W. of track, 480 feet S. of mile 17-210.	864.49	864.54
	Base of G.T.R. rail opposite B.M. 726.	865.46	865.51
DCCLXXXII.	On boulder, 30 feet E. of track, 58 feet S. of mile post 16-211.	868.11	868.16
	Base of G.T.R. rail opposite B.M. DCCLXXXII.	869.57	869.62
727	On boulder, 84 feet W. of track, 340 feet S. of mile 15-217.	875.91	875.95
	Base of G.T.R. rail opposite B.M. 727.	877.57	877.61
	Centre of G.T.R. trestle over brook.....	879.46	879.50
DCCLXXXIII.	On rock, 10 feet W. of track, 2,515 feet S. of mile 14-213.	888.83	888.87
	Base of G.T.R. rail opposite B.M. DCCLXXXIII.	887.91	887.95
DCCLXXXIV.	On rock, 34 feet W. of main track, 68 feet S. of mile 14-213.	883.24	883.28
	Base of G.T.R. rail opposite B.M. DCCLXXXIV.	884.91	884.95
DCCLXXXV.	On rock, 8 feet E. of track, 365 feet S. of mile 13-214.	873.70	873.83
	Base of G.T.R. rail opposite B.M. DCCLXXXV.	872.47	872.51

7-8 EDWARD VII., A. 1908

TORONTO to North Bay, &c.—Complete List of Bench Marks, &c.—Concluded.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCLXXXVI.	On rock, 7 feet W. of track, 610 feet S. of mile 12-215.....	829.33	829.37
	Base of G.T.R. rail opposite B.M. DCLXXXVI.....	828.12	828.16
DCLXXXVII.	Centre of G.T.R. trestle over brook.....	804.31	804.34
	On rock, 13 feet E. of track, 39 feet S. of mile 11-216.....	768.12	768.15
	Base of G.T.R. rail, opposite B.M. DCLXXXVII.....	769.89	769.92
DCLXXXVIII.	Base of G.T.R. rail, centre of trestle over brook.....	750.26	750.29
	On E. face of S. abutment of bridge over Wistawasing river.....	739.51	739.54
	Centre of G.T.R. bridge over Wistawasing river.....	743.53	743.56
	Base of G.T.R. rail, at crossing of Nipissing Nasbonsing Rail- way.....	742.63	742.66
DCLXXXIX.	On rock, 9 ft. E. of track, 1,560 ft. S. of mile 9-218.....	757.83	757.86
	Base of G.T.R. rail, opposite B.M. DCLXXXIX.....	757.42	757.45
	Centre of G.T.R. trestle over brook.....	727.57	727.60
	Base of G.T.R. rail at crossing.....	725.55	725.58
DCCXC.	On rock, 8½ ft. W. of track, 2,000 ft. S. of mile 8-219.....	712.83	712.86
DCCXCI.	Base of G.T.R. rail, opposite B.M. DCCXC.....	710.70	710.73
	On rock, 9 ft. W. of track, 129 ft. N. of S. semaphore.....	675.88	675.90
	Base of G.T.R. rail, opposite B.M. DCCXCI.....	675.59	675.61
	Base of G.T.R. rail, overhead crossing of road.....	671.75	671.77
	Base of G.T.R. rail, overhead crossing of brook.....	671.56	671.58
	Base of G.T.R. rail, at Callender crossing.....	670.59	670.61
DCCXCII.	Base of G.T.R. rail, at Callender station.....	670.21	670.23
	On rock, 8½ ft. W. of track, 19 ft. S. of mile post 7-220.....	672.41	672.43
	Base of G.T.R. rail, opposite B.M. DCCXCII.....	672.93	672.95
	Base of G.T.R. rail, at crossing.....	684.62	684.64
728	On rock, 17½ ft. W. of track, 650 ft. N. of mile 6-221.....	705.59	705.61
DCCXCIII.	Base of G.T.R. rail, opposite B.M. 728.....	705.92	705.94
	On rock, 9½ ft. W. of track, 1,060 ft. S. of mile 5-222.....	679.26	679.28
	Base of G.T.R. rail, opposite B.M. DCCXCIII.....	678.37	678.39
	Base of G.T.R. rail, centre of trestle over brook.....	671.47	671.49
	Base of G.T.R. rail, at crossing.....	674.76	674.78
DCCXCIV.	On E. face of S. abutment of bridge over Riviere à la Vase.....	673.16	673.17
	Centre of bridge (G.T.R.) over Rivier à la Vase.....	674.94	674.95
	Base of G.T.R. rail, at Nipissing station crossing.....	675.40	675.41
	Base of G.T.R. rail, at Nipissing station.....	675.38	675.39
DCCXCV.	Base of G.T.R. rail, at junction with C.P.R. Nipissing.....	676.24	676.25
	On rock, 10 ft. W. of track, at junction of G.T.R. with C.P.R.....	677.50	677.51
	Base of G.T.R. rail, opposite B.M. DCCXCV.....	676.62	676.63
	C.P.R. bench, W. of track marked (653.77).....	678.60	678.61
	Base of C.P.R. rail, at crossing.....	673.63	673.64
DXLVI.	Base of C.P.R. rail, junction to Callender.....	673.30	673.31
	On rock, 13 ft. N. of track, 717 ft. W. of mile 114 from Chalk River.....	667.43	667.44
	Base of G.T.R. rail, opposite B.M. DXLVI.....	665.31	665.32
611	C.P.R. bench, marked (642.69).....	667.65	667.62
	On rock, 14 ft. S. of track, 95 ft. E. of mile 115.....	654.92	654.93
	Base of G.T.R. rail, opposite B.M. 611.....	654.50	654.51
DXLV.	C.P.R. bench, marked (630.87).....	655.75	655.74
	On rock, 9 ft. N. of track, 280 ft. E. of mile 116.....	652.99	652.99
	Base of G.T.R. rail, opposite B.M. DXLV.....	650.81	650.81
	C.P.R. bench, marked (625.65).....	650.55	650.55
	Centre of C.P.R. culvert, 116-19 miles from Chalk River.....	651.86	651.86
	Base of C.P.R. rail, at crossing.....	652.36	652.36
I.	Base of C.P.R. rail, junction of T.N.O. Ry.....	653.55	653.55
	Inside edge coping, 4th altar step, W. end of S. abutment of bridge.....	646.06	646.06
DXLIV.	On W. end of S. abutment of bridge over Chippewa creek.....	650.71	650.71
	Centre of C.P.R. bridge over Chippewa creek.....	654.03	654.03
DCCXCVI.	Base of G.T.R. rail, at crossing.....	653.91	653.91
	On base, E. face of C.P.R. North Bay.....	663.19	663.19
	Base of C.P.R. rail, opposite North Bay station.....	661.78	661.78

SESSIONAL PAPER No. 19a

ROUSES' POINT TO MONTREAL, VIA LACOLLE JUNCTION, HOWICK JUNCTION, VALLEYFIELD, COTEAU JUNCTION AND LACHINE.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
M [⊕] -B	20.6 ft. from N.E. corner of Chapman building, Rouses' Point, N.Y.	107.96	107.96
	Base of D. & H. Railway at Chapman street crossing, Rouses' Point, N.Y.	129.25	129.25
	Base of D. & H. Railway at Pratt street crossing, Rouses' Point, N.Y.	123.15	123.15
DCI.	Base of D. & H. Railway at Rouses' Point station	122.48	122.48
	+ On N.E. corner of Rouses' Point station	123.76	123.76
639	Base of D. & H. Railway at crossing of Rutland Railway	120.31	120.31
	On boulder at boundary line, U.S. and Canada	113.40	113.41
	Base of rail at boundary line, U.S. and Canada	116.37	116.39
	Top of bronze cap Bench Well A in boundary, near River	93.60	93.63
	Cavity in bronze cap Bench Well A in boundary, near River	93.56	93.59
	Top of inside tube, Bench Well A in boundary, near River	101.57	101.59
	Top of outside tube, Bench Well A in boundary, near River	102.70	102.72
DCII.	On W. face of S. wall of G.T.R. culvert, 730 ft. S. of mile 46½	109.29	109.31
	Base of rail, centre of G.T.R. culvert, 730 ft. S. of mile 46½	113.57	113.59
	Base of rail, crossing 580 ft. S. of mile 45½	117.33	117.35
737	+ On E. end of S. wall culvert, 210 ft. N. of semaphore	122.26	122.29
	Base of G.T.R. rail, opposite B.M. 737	126.71	126.74
	Base of G.T.R. rail, at Lacolle station	130.42	130.45
	Base of G.T.R. rail, at crossing	130.77	130.80
	Base of G.T.R. rail, at crossing of Napierville Railway	141.50	141.54
738	+ On S. base stone of G.T.R. tank, Lacolle village	152.11	152.15
	Base of rail, opposite Lacolle village station	153.86	153.90
DCCCXIX.	Base of G.T.R. rail, Lacolle village station crossing	154.82	154.86
	On S.E. corner of A. Wilson's house back of G.T.R. station	156.72	156.78
DCCXX.	Base of G.T.R. rail, at road crossing	166.17	166.22
DCCXXI.	On E. end of N. face of culvert, N. side of G.T.R.	161.84	161.89
	Base of G.T.R. rail, opposite B.M. DCCXX.	166.26	166.31
	On N. end of W. abutment of G.T.R. bridge, Lacolle river	163.80	163.85
	Base of G.T.R. rail, centre of G.T.R. bridge, Lacolle river	166.95	167.00
	Base of G.T.R. rail, crossing	178.29	178.34
DCCXXII.	On S. gable of priest's house, Ste. Claude de Lacolle	193.00	193.05
DCCXXIII.	On N. side of Ste. Claude R.C. Church	192.81	192.86
DCCXXIV.	On E. end of S. face of culvert, 125 ft. E. of mile 14	182.59	182.65
	Base of G.T.R. rail, opposite B.M. DCCXXIV	185.14	185.20
	Base of G.T.R. rail, opposite Henrysburh station	204.36	204.42
	Base of G.T.R. rail, opposite Henrysburh station crossing	204.71	204.77
DCCXXV.	On E. end of S. face of culvert, 2,262 ft. W. of mile 15	187.75	187.82
	Base of G.T.R. rail, opposite B.M. DCCXXV	191.16	191.23
739	+ On N. end of culvert, 340 ft. E. of mile 16	193.94	194.01
	Base of G.T.R. rail, opposite B.M. 739	195.10	195.26
DCCXXVI.	On E. end of S. face of culvert, 1,620 ft. W. of mile 16	192.20	192.27
	Base of G.T.R. rail, opposite B.M. DCCXXVI	196.99	197.06
	Base of G.T.R. rail, at road crossing	203.31	203.38
DCCXXVII.	Base of G.T.R. rail, at road crossing	217.08	218.05
	On W. end of N. face of culvert, 480 ft. W. of mile 17	228.53	228.61
DCCXXVIII.	Base of G.T.R. rail, opposite B.M. DCCXXVII	226.51	226.59
	On S. end face, W. wall of culvert, 1,370 ft. W. of mile 18	207.50	207.58
	Base of G.T.R. rail, opposite B.M. DCCXXVIII	210.65	210.73
	Base of G.T.R. rail, crossing 1,380 ft. W. of mile 18	210.58	210.66
DCCXXIX.	On E. end of S. face of culvert, 1,620 ft. W. of mile 19	181.60	181.69
	Base of G.T.R. rail, opposite B.M. DCCXXIX	184.10	184.19
	Base of G.T.R. rail, centre of bridge over Chambly river	182.84	182.93
DCCXXX.	On boulder 29.7 ft. N. of track, 2,228 ft. W. of mile 20	182.42	182.52
	Base of G.T.R. rail, opposite B.M. DCCXXX	184.52	184.62
	Base of G.T.R. rail, crossing	185.83	185.93
	Base of G.T.R. rail, opposite Johnson station	192.04	192.14
	Base of G.T.R. rail, opposite Johnson station crossing	193.14	193.14
	Base of G.T.R. rail, at Henningford junction	189.20	189.30
DCCXXXI.	On W. end of small culvert, 2,120 ft. E. of mile 22	181.22	181.32
	Base of G.T.R. rail, opposite B.M. DCCXXXI	185.50	185.60
DCCXXXII.	On S. end of culvert, 162 ft. W. of mile 22	179.84	179.95
	Base of G.T.R. rail, opposite B.M. DCCXXXII	182.04	182.15
	Base of G.T.R. rail, crossing	186.08	186.19
	Base of G.T.R. rail, centre of bridge over Norton brook	178.87	178.98
740	+ On boulder, 22 ft. N. of track, 600 ft. E. of mile 23	177.07	177.18
	Base of G.T.R. rail, opposite B.M. 740	179.43	179.54
	Base of G.T.R. rail, centre of bridge over Cranberry brook	178.77	178.89
741	On boulder, 26 ft. S. of track and 1,745 ft. W. of mile 24	177.07	177.19
	Base of G.T.R. rail, opposite B.M. 741	179.07	179.19
DCCXXXIII.	On rock 8.15 ft. S. of track, 1,614 ft. E. of mile 25	184.43	184.55

7-8 EDWARD VII., A. 1908

ROUSE'S Point to Montreal, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
	Base of G.T.R. rail, opposite B.M. DCCCXXXIII.....	184.78	184.90
	Base of G.T.R. rail, opposite Bolton station.....	195.85	195.98
DCCCXXXIV.	On rock 9 ft. S. of track and 81 ft. W. of mile 26.....	196.13	196.26
DCCCXXXV.	Base of G.T.R. rail, opposite B.M. DCCCXXXIV.....	195.08	195.21
	On rock 8.65 ft. of track and 1,530 ft. W. of mile 27.....	196.13	196.26
DCCCXXXVI.	Base of G.T.R. rail, opposite B.M. DCCCXXXV.....	204.11	204.25
	On rock 7.65 ft. S. of track, and 2,330 ft. W. of mile 28.....	203.93	204.07
	Base of G.T.R. rail, opposite B.M. DCCCXXXVI.....	182.26	182.40
	Base of G.T.R. rail, at crossing.....	182.55	182.69
DCCCXXXVII.	On E. end of N. face of culvert, 590 ft. W. of mile 30.....	183.56	183.70
	Base of G.T.R. rail, opposite B.M. DCCCXXXVII.....	179.31	179.46
	Base of G.T.R. rail, at crossing.....	151.15	151.30
DCCCXXXVIII.	On S. face of E. abutment of bridge over Norton brook.....	155.12	155.27
	Base of G.T.R. rail, opposite centre of bridge over Norton brook.....	142.08	142.24
	Base of G.T.R. rail, opposite Aubrey station.....	138.00	138.16
742	Base of G.T.R. rail, opposite Aubrey station.....	141.45	141.61
	+ On coping, N. end of culvert, 2,080 ft. E. of mile 33.....	141.66	141.82
	Base of rail, opposite B.M. 742.....	141.68	141.84
	Base of rail at crossing.....	136.46	136.63
DCCCNVIII.	On W. end of S. face of culvert, 2,570 ft. W. of mile 34.....	141.87	142.04
	Base of G.T.R. rail, opposite B.M. DCCCNVIII.....	141.77	141.94
DCCCNVII.	Base of G.T.R. rail, opposite B.M. DCCCNVII.....	137.63	137.80
	On rock 7.5 ft. N. of track and 560 ft. E. of mile 34.....	140.80	140.97
	Base of G.T.R. rail, crossing.....	142.98	143.16
	Base of G.T.R. rail, crossing.....	142.70	142.88
DCCCNVI.	Base of G.T.R. rail, opposite B.M. DCCCNVI.....	141.50	141.69
746	On S. face, w. abutment, bridge over English river.....	131.49	131.68
	On S. seat, W. abutment, bridge over English river.....	130.89	131.08
	Base of G.T.R. rail, crossing.....	125.55	125.74
	Base of G.T.R. rail, crossing.....	128.80	128.99
	Base of G.T.R. rail, crossing.....	129.86	130.05
DCCCNV.	Base of G.T.R. rail, at Howick Junction.....	129.60	129.79
	Base of G.T.R. rail, opposite B.M. DCCCNV.....	132.54	132.73
735	On S. face of culvert, 245 ft. W. of mile 37.....	132.28	132.48
	Base of G.T.R. rail, crossing.....	129.26	129.46
	+ On N.E. corner of W. abutment, bridge over Chateauguay river.....	131.45	131.65
DCCCNIV.	Base of rail, centre of bridge over Chateauguay river.....	129.47	129.67
	On W. face of W. abutment, bridge over Chateauguay river.....	132.23	132.43
	Base of G.T.R. rail, crossing.....	129.25	129.45
DCCCNIII.	Base of G.T.R. rail, opposite B.M. DCCCNIII.....	131.45	131.65
	On N. face of culvert, 1,600 ft. W. of mile 39.....	138.07	138.28
734	Base of G.T.R. rail, opposite B.M. 734.....	135.58	135.79
	+ On boulder 8.85 ft. N. of track and 715 ft. W. of mile 40.....	141.98	142.19
	Base of G.T.R. rail, crossing.....	140.88	141.09
DCCCNII.	Base of G.T.R. rail, opposite B.M. DCCCNII.....	140.74	140.96
	On N. end of W. face of culvert, 195 ft. S. of mile 42.....	137.01	137.24
	Base of G.T.R. rail, at St. Louis station.....	129.96	130.19
	Base of G.T.R. rail, centre of bridge over St. Louis river.....	135.55	135.78
DCCCNXI.	Base of G.T.R. rail, at crossing, St. Louis.....	135.23	135.46
	On N. face of N. pier of G.T.R. bridge over St. Louis river.....	135.71	135.94
	Base of G.T.R. rail, at crossing, St. Louis.....	129.08	129.31
733	Base of G.T.R. rail, at crossing, St. Louis.....	136.28	136.51
	Base of G.T.R. rail, at crossing, St. Louis.....	140.90	141.23
DCCCNX.	On N.W. corner of culvert, 1,580 ft. S. of mile 45.....	143.02	143.26
	Base of G.T.R. rail, opposite B.M. DCCCNX.....	142.38	142.62
	On N. end of W. face of culvert, opposite mile post 89.....	157.35	157.60
732	+ Base of G.T.R. rail, opposite B.M. 732.....	153.14	153.39
	On boulder, 25 ft. E. of track and 2,000 ft. N. of mile 89.....	163.19	163.44
DCCCNX.	Base of G.T.R. rail, at crossing.....	161.05	161.30
	+ On W. face of culvert, 355 ft. N. of mile 47.....	163.01	163.27
731	Base of G.T.R. rail, opposite B.M. 731.....	159.80	160.06
	+ On S. end of culvert 355 ft. N. of mile 47.....	162.96	163.22
	Base of G.T.R. rail, at Cecile Junction.....	160.33	160.79
730	Base of G.T.R. rail, crossing S. side of Beauharnois canal.....	149.57	149.84
	+ On E. end of S. abutment of bridge over Beauharnois canal.....	153.22	153.49
DCCCNVIII.	Base of G.T.R. rail, centre of bridge over Beauharnois canal.....	153.52	153.79
	On S. face of sluice portal, 1 1/2 miles E. of lock 1.....	153.46	153.73
	Base of G.T.R. rail, at crossing, N. side of canal.....	143.44	143.71
	Base of G.T.R. rail, at crossing.....	153.35	153.62
DCCCNVII.	Centre of bridge over M.C.C. mills channel.....	149.22	149.49
	On E. end of N. abutment of bridge over tail race of M.C.C. mills.....	148.22	148.46
	Base of G.T.R. rail, at crossing, Valleyfield.....	142.84	143.11
DCCCNVI.	Base of G.T.R. rail, opposite B.M. DCCCNVI.....	149.94	150.21
	On E. face of culvert, E. of Valleyfield iron works crossing.....	155.08	155.36
		151.33	151.61

SESSIONAL PAPER No. 19a

Rouses' Point to Montreal, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
DCCCV.	Base of G.T.R. rail at Valleyfield Iron Works crossing	155.49	155.77
	On W. end of Larocque House, Valleyfield...	157.23	157.51
	+ On coping S. end of lower gates, lock No. 14, Valleyfield	151.31	151.62
	+ On coping N. end of lower gates, lock No. 14, Valleyfield	151.30	151.58
	+ On coping S. end of upper gates, lock No. 14, Valleyfield	151.36	151.61
729	+ On coping N. end of upper gates, lock No. 14, Valleyfield	151.29	151.57
DCCCLIV.	Centre of M.C.C. bridge over S. channel, Valleyfield	157.21	157.52
	On retaining wall S. end of bridge over N. channel, Valleyfield	157.67	157.95
	Centre of M.C.C. bridge over N. channel, Valleyfield	158.00	158.28
	Base of G.T.R. rail crossing, Valleyfield station	158.63	158.91
	Base of G.T.R. rail, Valleyfield station	160.20	160.48
	Base of G.T.R. rail, crossing, Valleyfield	157.70	157.99
DCCCLIII.	On N. face of S. abutment of bridge over 3rd channel of St. Lawrence river	171.01	171.31
	Centre of G.T.R. bridge over 3rd channel, St. Lawrence river	173.72	174.02
DCCCLII.	On S. face of N. abutment of bridge over 3rd channel of St. Lawrence river	171.06	171.36
DCCCL.	On N. face of S. abutment of bridge over 2nd channel of St. Lawrence river	171.12	171.42
	Centre of G.T.R. bridge over 2nd channel, St. Lawrence river	173.85	174.15
DCCCL.	On S. face of N. abutment of bridge over 2nd channel of St. Lawrence river	171.12	171.42
DCCCLCX.	On N. face of S. abutment of bridge over steamboat channel of St. Lawrence river	171.36	171.66
	Centre of G.T.R. bridge over steamboat channel of St. Lawrence river	173.80	174.10
DCCCLCVIII.	On S. face of N. abutment of bridge over steamboat channel of St. Lawrence river	171.36	171.66
	Base of G.T.R. rail, centre of overhead crossing	171.00	171.30
	Base of G.T.R. rail, centre of overhead crossing, S. side of Soulanges canal	173.99	174.30
	Base of G.T.R. rail, centre of G.T.R. bridge over Soulanges canal	171.12	171.43
DCCCLCVII.	On N. face of N. abutment of G.T.R. bridge over Soulanges canal	174.11	174.42
CCCCXXVIII.	On E. face of overhead crossing of road, N. side of Soulanges canal	160.85	161.17
547	Iron bolt in W. wall of crossing of road, S. side of canal	160.90	161.30
CCCCXXIX.	On N. face of stone block, lower end of bridge over canal	158.76	159.07
	Coping N. end of upper gates of lock 1, Soulanges canal	158.00	158.31
	Coping S. end of upper gates of lock 1, Soulanges canal	157.99	158.30
	Coping N. end of lower gates of lock 1, Soulanges canal	158.02	158.33
	Coping S. end of lower gates of lock 1, Soulanges canal	158.04	158.34
546	Iron bolt in W. wall of crossing of road, N. side of canal	159.41	159.76
	Base of G.T.R. rail over road along N. side of canal	171.00	171.40
	Base of G.T.R. rail, crossing along branch to Valleyfield	159.70	160.01
624	+ On coping S.W. corner of highway bridge over Delisle river	158.40	158.71
DLXXIX.	On W. face of S. abutment of highway bridge over Delisle river	156.43	156.74
	Base of G.T.R. rail, crossing W. shore of Delisle river	160.79	161.10
	Base of G.T.R. rail, centre of bridge over Delisle river	160.88	161.19
DCCCLXIV.	On S. end of E. abutment of bridge over Delisle river	158.83	159.14
	Base of G.T.R. rail, crossing E. shore of Delisle river	160.90	161.21
	Base of G.T.R. rail at Riviere Rouge crossing	161.73	162.01
	Base of G.T.R. rail at Riviere Rouge station	161.34	161.65
DCCCLXIII.	On N. face of W. abutment of bridge over Riviere Rouge	157.71	158.05
	Base of G.T.R. rail, centre of bridge over Riviere Rouge	160.96	161.27
	Base of G.T.R. rail, opposite B.M. DCCCLXI	159.31	159.62
DCCCLXII.	On E. face of N. end of culvert, 15 ft. W. of mile 34	151.11	151.42
	Base of G.T.R. rail, St. Eulmandel crossing	162.06	163.28
	Base of G.T.R. rail, opposite B.M. DCCCLXI	162.72	163.04
DCCCLXI.	On S. end of E. wall of culvert, 40 ft. of mile 34	159.28	159.60
	Base of G.T.R. rail, opposite B.M. DCCCLX	152.03	152.35
DCCCLX.	On S. end of W. wall of culvert, 784 ft. W. of mile 31	149.59	149.91
	Base of G.T.R. rail at St. Dominique crossing	156.68	157.00
	Base of G.T.R. rail at St. Dominique station	157.20	157.52
	Base of G.T.R. rail at Cedars crossing	159.13	159.75
749	On N. end of E. side of culvert at Cedars station	158.91	159.26
	Base of G.T.R. rail at Cedars station	159.15	159.77
	Base of G.T.R. rail, crossing E. of Cedars station	158.68	159.01
	Base of G.T.R. rail, opposite B.M. DCCCLIX	123.51	123.87
DCCCLIX.	On W. end of E. face of culvert, 193 ft. E. of mile 26	118.77	119.10
	Base of G.T.R. rail, 2nd crossing E. of Cedars station	119.00	119.33
	Base of G.T.R. rail, opposite B.M. DCCCLVIII	92.05	92.38
DCCCLVIII.	On W. end of S. face of culvert, 1,480 ft. W. of mile 25	90.97	91.30
	Base of G.T.R. rail, opposite B.M. DCCCLVII	83.79	84.12
DCCCLVII.	On S. end of E. ballast wall of culvert, 735 ft. E. of mile 25	78.91	79.24
	Base of G.T.R. rail, crossing of road to Casades village	81.54	81.87

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ROUSE'S Point to Montreal, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	Elevations.	
		Instrumental.	Adjusted.
	Base of G.T.R. rail, opposite Vaudreuil station.....	84.76	85.09
	Base of C.P.R. rail, opposite Vaudreuil station.....	86.07	86.40
	Base of G.T.R. rail, opposite B.M. DCCCXV.....	89.63	89.96
DCCCXV.	On S. end of W. abutment, G.T.R. bridge over Ottawa river at Vaudreuil.....	88.30	88.61
	Base of G.T.R. rail, opposite B.M. DCCCXIV.....	93.23	93.56
DCCCXIV.	On S. end of E. abutment, G.T.R. bridge over Ottawa river at Vaudreuil.....	91.94	92.27
	Base of G.T.R. rail, crossing road along W. shore Ile Perrot brook.....	93.22	93.55
	Base of G.T.R. rail, crossing road along E shore Ile Perrot brook.....	90.03	90.35
DCCCXIII.	On N.W. face of W. abutment of G.T.R. bridge, Ile Perrot brook.....	92.01	92.33
	Base of G.T.R. rail, centre G.T.R. bridge, Ile Perrot brook.....	96.59	96.91
	Base of G.T.R. rail, opposite B.M. DCCCXII.....	105.27	105.59
DCCCXII.	On N.W. end of W. abutment of G.T.R. bridge over Ottawa river at Ste. Anne de Bellevue.....	105.54	105.86
	Base of C.P.R. rail, opposite Ste. Anne de Bellevue station.....	117.75	118.07
	Base of G.T.R. rail, crossing to C.P.R. station.....	116.76	117.08
	Base of G.T.R. rail, opposite Ste. Anne de Bellevue station.....	121.22	121.54
	Base of G.T.R. rail, opposite B.M. DCCCLVI.....	120.37	120.69
DCCCLVI.	On W. end of S. face of C.P.R. culvert, 660 ft. W. of G.T.R. mile 20.....	113.31	113.63
	Base of C.P.R. rail, opposite Bay View station.....	114.12	114.44
	Base of G.T.R. rail, opposite Baie D'Urfe station.....	114.12	114.44
	Base of G.T.R. rail, opposite B.M. DCCCLV.....	113.62	113.94
DCCCLV.	On E. end of S. face of G.T.R. culvert, 123 ft. E. of mile 19.....	109.04	109.36
	Base of G.T.R. rail, opposite B.M. DCCCLIV.....	105.76	106.08
DCCCLIV.	On W. end of S. face of G.T.R. culvert, 210 ft. W. of mile 18.....	97.93	98.25
	Base of C.P.R. rail, opposite Beaurepaire station.....	106.85	107.17
	Base of G.T.R. rail, opposite Beaurepaire station.....	105.64	105.96
	Base of G.T.R. rail, opposite culvert, opposite G.T.R. mile 17.....	93.82	94.14
DCCCLIII.	On E. end of S. face of C.P.R. culvert, opposite G.T.R. mile 17.....	83.66	83.98
	Base of G.T.R. rail, opposite B.M. DCCCLII.....	105.56	105.87
DCCCLII.	On W. wall of G.T.R. culvert, 872 ft. E. of mile 16.....	102.40	102.71
	Base of G.T.R. rail, opposite Beaconsfield station.....	105.13	105.44
	Base of C.P.R. rail, opposite Beaconsfield station.....	106.95	107.26
	Base of G.T.R. rail, opposite Beaconsfield crossing.....	104.97	105.28
	Base of G.T.R. rail, opposite B.M. DCCCLI.....	103.09	103.40
DCCCLI.	On E. end of N. face of G.T.R. culvert, 745 ft. S. of mile 15.....	96.62	96.93
	Base of G.T.R. rail at Pointe Claire station.....	108.11	108.42
	Base of C.P.R. rail at Cedar Park station.....	111.71	112.02
	Base of G.T.R. rail at crossing.....	103.71	104.02
	Base of G.T.R. rail at Lakeside station.....	96.88	97.18
	Base of C.P.R. rail at Lakeside station.....	96.71	97.01
	Base of G.T.R. rail at Lakeside crossing.....	96.58	96.88
	Base of G.T.R. rail, culvert 1,610 ft. W. of mile 13.....	96.32	96.62
DCCCL.	On E. end of S. face of culvert, 1,610 ft. W. of mile 13.....	89.13	89.43
	Base of G.T.R. rail, centre of G.T.R. culvert, 220 ft. W. of Valois station.....	90.13	90.43
DCCCL.	On S. base of W. wall of G.T.R. culvert, 220 ft. W. of Valois station.....	73.86	74.16
	Base of G.T.R. rail, opposite Valois crossing.....	89.60	89.90
	Base of G.T.R. rail, opposite Valois station.....	89.78	90.08
	Base of C.P.R. rail, opposite Valois station.....	89.14	89.44
	Base of G.T.R. rail, opposite B.M. DCCCXLIX.....	89.24	89.54
DCCCXLIX.	On W. face of wall of culvert, 511 ft. E. of mile 12.....	77.68	77.98
	Base of G.T.R. rail, opposite Strathmore crossing.....	89.44	89.74
	Base of G.T.R. rail, opposite Strathmore station.....	89.42	89.72
	Base of G.T.R. rail, opposite B.M. DCCCXLVIII.....	88.70	89.00
DCCCXLVIII.	On W. end of N. face of culvert, 585 ft. E. of mile 11.....	86.09	86.39
CCCXCVIII.	On rear base, W. side of Dorval R. C. church.....	93.55	93.85
	Base of G.T.R. rail, opposite Dorval crossing.....	85.26	85.56
	Base of G.T.R. rail, opposite Dorval station.....	85.25	85.55
	Base of C.P.R. rail, opposite Dorval station.....	89.01	89.31
	Base of G.T.R. rail, opposite B.M. 747.....	88.75	89.05
	On S.E. peak of culvert, 171 ft. W. of mile 9.....	87.88	88.18
DCCCXLVII.	On S.E. face of W. wall of culvert, 171 feet W. of mile 9.....	80.61	80.91
	Base of G.T.R. rail, opposite Dixie station.....	95.97	96.26
	Base of G.T.R. rail, opposite Dixie crossing.....	96.63	96.92
	Base of G.T.R. rail, opposite B.M. DCCCXLII.....	97.68	97.97
DCCCXLII.	On S.E. face of culvert, 1,520 feet E. of mile 9, W. of Montreal.....	92.65	92.94
	Base of G.T.R. rail, opposite culvert, 905 feet W. mile 8, W. of Montreal.....	86.08	86.37
DCCCXLI.	On S.W. face of G.T.R. culvert, 905 feet W. of mile 8, W. of Montreal.....	82.90	83.19

SESSIONAL PAPER No. 19a

ROUSES' Point to Montreal, &c.—Complete List of Bench Marks, &c.—Continued.

Bench Marks.	Location and Description.	ELEVATIONS.	
		Instrumental.	Adjusted.
746	On S.W. corner of G.T.R. culvert, 905 feet W. of mile 8, W. of Montreal.	85.53	85.82
CCCXCVI.	Base of G.T.R. rail, opposite Lachine main station.	80.20	80.49
	On S.E. corner of McKee's house on Lachine Rd., to Lachine wharf.	79.20	79.49
	Base of G.T.R. rail, crossing of Electric Ry., branch to Lachine wharf.	75.30	75.65
745	On N.W. peak of culvert 1,820 feet E. of mile 8, W. of Montreal	77.15	77.44
DCCCXL.	Base of G.T.R. rail, opposite B.M. DCCCXL.	77.13	77.42
	On E. face of W. wall of culvert, 1,820 feet E. of mile 8, W. of Montreal.	72.59	72.88
	Base of G.T.R. rail, 18th Avenue crossing, Lachine.	77.05	77.34
	Base of G.T.R. rail, opposite convent, Lachine.	76.86	77.15
	Base of G.T.R. rail, opposite Dominion station, Lachine.	76.55	76.84
DC.	On W. end of S. face of guard wall, S. end of Curran bridge, Montreal.	54.66	54.90
DCCCXLVII.	On N.W. corner, foundation of freight shed, close to track, Mountain St.	46.69	46.95
	Base of G.T.R. rail at Mountain St. crossing, Montreal.	45.76	46.02
	Base of G.T.R. rail at Richmond St. crossing, Montreal.	45.68	45.94
DCCCXLVI.	On E. base, front of St. Cunégonde R.C. church, Montreal.	55.54	55.80
	Base of G.T.R. rail, opposite St. Henri station.	59.84	60.10
DCCCXLV.	On S. foundation of J. Duffy's house, St. Philippe street.	63.86	64.12
	Base of G.T.R. rail, Côte St. Paul Rd. crossing.	62.24	62.52
	Base of G.T.R. rail, opposite B.M. DCCCXLIV.	60.70	60.98
DCCCXLIV.	On boulder, 12 feet N. of track and 405 feet E. of Montreal W. station.	59.77	60.05
	Base of G.T.R. rail, opposite Montreal W. station.	60.87	61.15
	Base of G.T.R. rail, opposite B.M. 748.	61.88	62.16
748	On boulder, 15.4 feet N. of track, 435 feet E. of mile 5, W. of Montreal.	58.78	59.06
	Base of G.T.R. rail at Rockfield station crossing.	70.81	71.10
	Base of G.T.R. rail at Rockfield station.	71.47	71.76
DCCCNXXIX.	Base of S. wall of C.P.R. crossing of G.T.R., Rockfield.	76.15	76.44
	Base of G.T.R. rail, centre of crossing, under C.P.R., Rockfield.	72.77	73.06
	Base of C.P.R. rail, centre of crossing of G.T.R., Rockfield.	105.24	105.53
744	On W. end of S. wall of C.P.R. crossing of G.T.R., Rockfield.	105.15	105.44
	Base of C.P.R. rail, centre of overhead crossing of Lachine Rd.	105.01	105.30
	Base of C.P.R. rail, centre of swing bridge over Lachine canal.	108.13	108.42
DLXXXI.	On W. face of S. pier of C.P.R. swing bridge over Lachine canal.	74.53	74.81
743	On S.W. end of S. abutment of C.P.R. swing bridge over Lachine canal.	109.12	109.40
	Base of C.P.R. rail at Highlands station, Lachine, P.Q.	115.88	116.11
	Base of C.P.R. rail, centre of C.P.R. crossing of Lachine lower road.	121.90	122.18
CCXCIII.	On W. side of first pier of C.P.R. bridge, Lachine.	93.85	94.13

FRENCH RIVER.

LIST OF PERMANENT BENCH MARKS SET ALONG FRENCH RIVER, BETWEEN NORTH BAY TOWN AND FRENCH RIVER VILLAGE ON GEORGIAN BAY.

ELEVATIONS BASED ON CHALONER'S DETERMINATION OF THE "CHIPPewa" BENCH MARK
AT NORTH BAY—649.86 ABOVE MEAN SEA LEVEL.

This elevation was carried to Frank's Bay across Lake Nipissing by water level transfer as deduced from simultaneous gauge observations at both places.

The canal levels for the French river, as shown on plan, are based on the elevations as published below and are not therefore subject to the corrections mentioned at the beginning of this report.

In the following list column No. 1 gives the Bench Marks set by this survey. Column No. 2 gives the Bench Marks set by the late J. W. Fraser during his survey in 1894. All his elevations have been reduced to the above mentioned datum.

The total length of this line from North Bay to Georgian Bay is 81 miles.

The levelling was done with the greatest care by Mr. F. H. Peters, Engineer for the Lake Nipissing work, under the direction of the District Engineer, S. J. Chapleau.

SESSIONAL PAPER No. 19a

(All Bench Marks are marked with cold chisel in rock, as well as paint.)

G.B.A.C.S.	FRASER.	Locality and Description.	Elevation.
Number.	Number.		
1	1	Frank's Bay, on ledge of rock 50' from shore [end of wharf north side ↓ ledge 1 (in yellow paint).....	648-18
	2	Near east end of Partridge Island, on south side, in rock, marked 2 ↓ yellow paint.....	647-80
	4	On rock, south side, about ½ mile above Chaudiere portage and near junction of ledge of rock and plateau, marked 4 ↓ yellow paint.	650-177
2		Drilled semi-circle around point of rock, about 150' south of pine stump, marked Δ 38. On point of island, separated from Chaudiere island by small channel to Dukes bay.....	643-69
	5	On rock, right side of Chaudiere portage and about 100' from west end, marked Δ 5, yellow paint.....	651-059
	9	On rock, at mouth of Restoul river, on east side. Tree in front of it cut off, flattened on face and two sides, with two cut branches left on top. Blazed faces, painted yellow. Yellow 9 in rock and.....	624-202
8		On small island, west of mouth of Restoul river, on south shore. On root of tree, which is also Δ.....	620-996
9		On point of rock on south shore on point west of Hales group of islands. Painted white.....	615-076
10		On ledge of rock on south side of small island on which is Δ * 61, and separated from point by small channel.....	615-649
11		On white pine tree, on east side of point on which is Δ * 71. About ¼ mile above Little Pine rapids, on east side of south channel.....	619-764
	10	At head of Little Pine rapid, on left side, on high rock. Broad cut in rock under point and 10 painted on rock in yellow.....	624-918
12		On rock, on point, on right side, opposite little island about 2,000' below Big Pine rapid, marked Δ 12. Red paint; visible from river.....	610-700
13		On rock, at head of Big Parisian rapid, on right side, marked Δ 13, in red paint; visible from river.....	607-958
14		On rock, on left of large island (Big Bluff island), above current, below Big Parisian rapid, about 90' down from up stream point. Marked Δ 14, in red paint; visible from river.....	605-840
15		On point of rock, right side, about 1,500' above Little Parisian rapid, marked Δ 15, in red paint; visible from river.....	600-637
16		On high point of rock, on right side, about 1½ miles below Little Parisian rapid, marked Δ 16, in red paint; visible from river.....	601-094
17		On side of steep rock, in niche on right side of south channel into Dry Pine lake, about 300' up from point of channel on left at Dry Pine lake. Marked Δ 17, in red paint; visible from river.....	600-910
18		On rock, on left side of river, about 1,500' above Recollet rapid. About 500' above very high walled cliff, on right side, which is just above rapid. Marked Δ 18, in red paint. Also, 10' down stream, on small white birch stump, is sign-board with red paint. Marked B.M. 18; visible from river.....	600-805
	16	On left side of river at foot of Recollet falls, on point of rock. Marked Δ 16, in yellow paint.....	593-176
19		On small point, on rock, right side of river, about 300' below small rock island, which is in sharp bend to right, ¼ mile above head of Potvin's island. Marked Δ 19, in red paint; visible from river.....	590-266
	18	At second rapid, below Recollet rapid, on rock on right side, opposite little island. Marked Δ 18, in yellow paint.....	594-146
20		On rock, on rock point on right, 1,500' below second rapid, below Recollet rapid. Marked Δ 20, in red paint; visible from river.....	589-564
21		On rock, on right side 3,500' below head of swift current, below second rapid. Marked Δ 21, in red paint; visible from river.....	589-682
22		On rock, on right side of small bay on right side at junction of French river and Pickers river, straight in from large island. Marked Δ 22, in red paint; visible from water.....	590-415
23		On sloping face of rock, on right side of little bay on right side of main channel, just up stream 1,000' from where main channel turns sharp to right to Dalles rapid.....	592-357 591-908
	19	At head of Dalles rapid, on left side on rock.....	
	20	On point of rock, left side of river, about 200' below point where river turns south to French River village. Marked Δ 20, in yellow paint.....	586-210
24		On rock, on left side of river. Marked Δ 24, in red paint. About 1,500' below head of swift, below Dalles rapid.....	585-423
26		Peter's B.M., top of iron ring bolt, set in solid rock about 250' southwest of Ontario Lumber Co.'s dock.....	590-628
25		Point of rock removed about 15' from ring bolt and nearer river. Marked Δ 22, in red paint.....	587-417

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MEAN TIDE AT QUEBEC.

The following information and deductions with regard to Mean Sea Level at New York compared with its determination at Quebec, as made by Dr. W. Bell Dawson from the Tidal Survey observations at the Dry Dock at Levis, will prove of interest.

The tidal observations have been obtained by a registering tide gauge, giving a continuous record day and night throughout the year, and reduced to a uniform datum.

The comparison is based upon the elevations of the sill of Old Lock No. 1 of the Lachine Canal, at the head of Montreal Harbour; where the levels meet which have been carried through from New York via Rouses' Point, and along the St. Lawrence from Quebec by Mr. R. Steckel.

Dr. Dawson, who is in charge of the Tidal and Current Survey for the Department of Marine and Fisheries, has reduced these levels to the Admiralty Low Water datum at Quebec, as used for the chart of Quebec Harbour. This datum has also been adopted by the Tidal Survey as the plane of reference for the Quebec Tidal Tables. It is defined by the Admiralty in their own publications, as 28.00 feet below the Bench Mark cut on the east side of the principal gateway to the Marine and Fisheries building in Quebec.

The various connections by means of which the reductions are made, are as follows:— From the Admiralty Bench Mark in Quebec to the Levis Dry Dock where the Tide Gauge is situated, connected by Mr. Steckel's levels across the river; one of his Bench Marks being set in the masonry of the dry dock. From Levis to Montreal, connected by Mr. Steckel's levels. From Montreal to Rouses' Point, from the levels of the Georgian Bay Canal Survey, which there connect with the United States Coast Survey levels from New York. The elevation taken for the Coast Survey Bench Mark at Rouse's Point is the revised value of 1903. The difference between Mr. Steckel's datum and that of the Georgian Bay Canal Survey, is based on a common Bench Mark at St. Lambert.

Admiralty bench mark at Quebec, as above described.....	28.00
Sill of old lock No. 1, Lachine canal. Difference of level as determined by Mr. R. Steckel, 15.50 feet above the Admiralty bench mark at Quebec. Resulting elevation.....	12.50
Mean sea level, or half tide at Quebec, as determined at the Levis dry dock; from the hourly ordinates of the tide during eight years of continuous observations, from 1894 to 1902. Mean of the eight years, 8.584 feet above the Admiralty datum.....	8.584
(The value adopted by the Royal Engineers in 1864, for mean sea level in Quebec Harbour, was 8.72 feet above the Admiralty datum. This would be some distance above the dry dock).	
Mean sea level at New York determined by the Georgian Bay Canal Survey, as 5.38 feet below the sill of old lock No. 1, Lachine canal.....	7.12
Steckel's datum referred to the Admiralty datum; the elevation of the Admiralty bench mark above his datum, being 27.039 feet.....	0.96
Admiralty low water datum at Quebec; adopted as the datum for the tidal survey.....	0.00
It thus appears that mean sea level or half tide at Quebec, when accurately determined by tidal observations, is 1.46 feet above mean sea level at New York.	

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ELEVATIONS ABOVE MEAN SEA LEVEL OF LOW WATER SURFACE AT
DIFFERENT POINTS ALONG THE PROPOSED GEORGIAN BAY
SHIP CANAL ROUTE, AS BASED ON PRECISE LEVEL LINES.

St. Lawrence River, at Bout de l'Île.....	16.0
Montreal Harbour, opposite Custom House.....	19.0
St. Lawrence River at Victoria Bridge..... (Approx.)	25.0
St. Lawrence River foot of Lachine Rapids (opposite Crawford's, Verdun).....	35.0
St. Lawrence River head of Lachine Rapids (Head Race M. L.H. & P. Co.).....	59.5
Lake St. Louis (Lachine).....	66.0
Ottawa River, St. Anne de Bellevue.....	66.7
Lake of Two Mountains.....	70.0

RIVIERE DES PRAIRIES.

River St. Lawrence, Bout de l'Île.....	16.0
Rivière des Prairies Village (below Rapid).....	18.4
Rivière des Prairies Village (above Rapid).....	25.4
Sault au Recollet (foot of second Rapid).....	26.8
Sault au Recollet (head of second Rapid).....	38.5
Sault au Recollet, Vian Bridge.....	42.0
Sault au Recollet, foot of first Rapid).....	42.5
Sault au Recollet (head of first Rapid).....	52.0
Cartierville Bridge.....	54.0
White Horse Rapid (foot).....	54.7
White Horse Rapid (head).....	58.7
Dutchmen's Rapid (foot).....	62.2
Dutchmen's Rapid (head).....	70.0

Carillon Canal (lower).....	70.2
Carillon Canal (upper).....	83.6
Grenville Canal (lower).....	84.7
Grenville Canal (upper).....	127.8
East Templeton.....	128.4
Ottawa (Rideau Locks).....	129.3
Booth's head race.....	167.6
Little Chaudière Rapids.....	176.5
Remicks Rapid.....	180.2
Deschênes Rapid (foot).....	180.8
Deschênes Rapid (head).....	190.7
Deschênes Lake, Fitzroy Harbour.....	190.8
Chats Falls (above).....	239.4
Arnprior.....	239.6
Cheneaux Rapids (foot).....	239.8
Cheneaux Rapids (head).....	240.2
Portage du Fort (foot).....	240.7
Portage du Fort (head).....	255.4
Sable Rapid (foot).....	256.8

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ELEVATIONS above Mean Sea Level of low water surface, &c. —Continued.

Sable Rapid (head)	263.0
Mountain Chute (foot).....	264.0
Mountain Chute (head).....	278.5
D'Argis Rapid (foot).....	278.7
D'Argis Rapid (head).....	284.7
Cahmet Rapid.....	285.4
Bryson.....	312.4
La Passe or La P. i. l.	313.4

ROCHER FENDU CHANNEL.

Head of Portage du V.	255.4
Rocher Fendu (foot).....	256.0
Rocher Fendu (head).....	260.0
Flat Rapid (foot).....	260.1
Flat Rapid (head).....	261.4
Long Rapid (foot).....	262.2
Long Rapid (head).....	277.7
La Barriere Rapid (foot).....	277.8
La Barriere Rapid (head).....	278.5
Muskrat Rapid (foot).....	279.1
Muskrat Rapid (head).....	286.8
Garvins Chute (foot).....	298.7
Garvins Chute (head).....	323.0
Des Jardins Rapids (foot).....	323.6
Des Jardins Rapids (head).....	336.0
Foot of dam.....	338.7
Head of dam.....	343.2
Paquette Rapid (foot).....	344.0
Paquette Rapid (head).....	352.0
Alhmette Rapid (foot).....	352.4
Alhmette Rapid (head).....	365.4
Pembroke.....	365.3
Des Joachims Rapids (foot).....	365.5
Des Joachims Rapids (head).....	390.5

CULBUTE CHANNEL.

Paquette Rapid (foot).....	344.0
Chapeau.....	344.5
Culbute Chute (foot).....	344.8
Culbute Chute (head).....	365.0
Fort William.....	365.4

Rockliffe.....	391.2
McSorley's Rapid (foot).....	393.0
McSorley's Rapid (head).....	396.3
Mirabeau Rapid (foot).....	393.5
Mirabeau Rapid (head).....	398.8
Rocher Capitaine Rapid (foot).....	398.9
Rocher Capitaine Rapid (head).....	441.4
Doyle's Rapid (foot).....	441.7

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ELEVATIONS above Mean Sea Level of low water surface. &c. —*Continued.*

Doyles' Rapid (head).....	442.8
Deux Rivières Rapid (foot).....	443.1
Deux Rivières Rapid (head).....	457.2
Tron Rapids (foot).....	457.7
Tron Rapids (head).....	461.8
La Veillee Rapids (foot).....	467.4
La Veillee Rapids (head).....	471.2
1½ miles east of Klock.....	475.6
Klock (foot of Rocky Farm Rapids).....	476.9
Rocky Farm Rapids (head).....	479.0
Burritt's Rapids (foot).....	480.0
Burritt's Rapids (head).....	482.0
Mattawa (foot of Johnson's Rapids).....	483.0
Johnson's Rapids (head).....	487.4
Boom Lake.....	496.8
Lake Plain Chant.....	517.7
Head of Les Epines Rapids.....	519.7
Head of Les Roses Rapids.....	526.1
Boulean Lake.....	532.4
Foot of Deep River.....	532.6
Parassens Falls (foot).....	532.7
Parassens Falls (head).....	570.6
Talon Chute (foot).....	589.0
Talon Lake.....	633.2
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Georgian Bay.....	578.5

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CONCLUSION.

The condensed information and elevations as contained in this report are given in the hope that the whole may be of some benefit to the other technical branches of the Government and to the engineering profession.

This part is published separately from the main report on the proposed Georgian Bay ship canal, in order that the information regarding this important branch of our work should be more readily available.

Respectfully submitted,

A. ST. LAURENT,

Assistant Chief Engineer and Engineer in charge.

Approved.

EUGENE D. LAFLEUR,

Chief Engineer.

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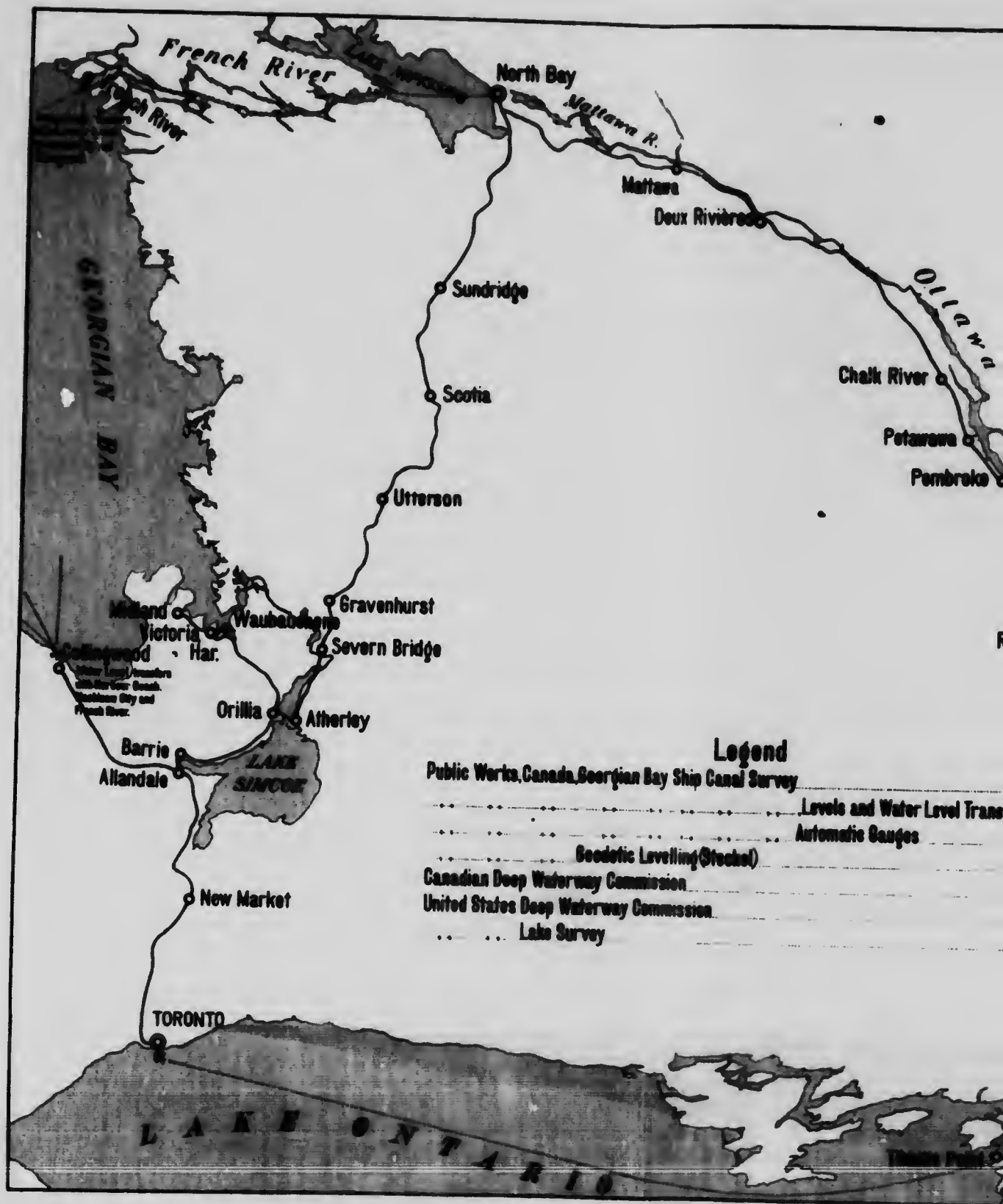
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Diagram
GEODETIC LEVELLING



Canada
Department of Public Works
GEODETIC LEVELLING

DIAGRAM

Showing Routes followed by Precise Levelling
GEORGIAN BAY SHIP CANAL
also comparative Routes
by other surveys
1907

