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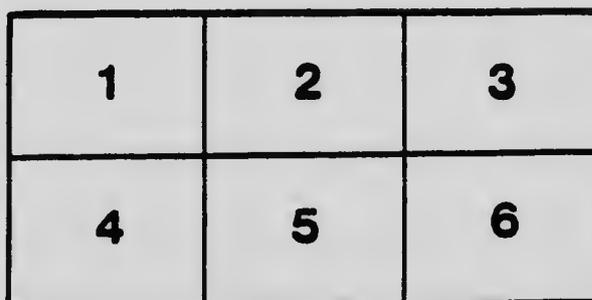
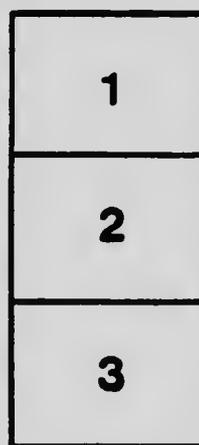
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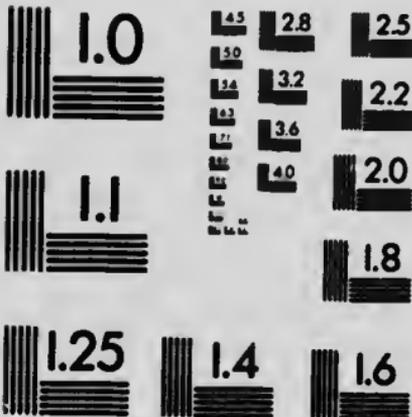
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757

**DEPARTMENT OF THE INTERIOR  
CANADA**

HON. W. J. ROCHE, *Minister*; W. W. CORY, *Deputy Minister*.

**TOPOGRAPHICAL SURVEYS BRANCH**

**REPORT  
ON  
LEVELLING OPERATIONS**

**From their Inauguration in Year 1908  
to October 31st, 1914**

WITH A

**SUMMARY OF THE RESULTS**

BY

**J. N. WALLACE, D.L.S.**



E. DEVILLE, LL.D.  
Surveyor General.

OTTAWA  
GOVERNMENT PRINTING BUREAU

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Third Meridian		Tps.	53-72	137
Fifteenth base line west, N. of Tp. 50		Rs.	1-27	141
Sixteenth " " 60		Rs.	1-27	145
Seventeenth " " 64		Rs.	1-27	150
Eighteenth " " 68		Rs.	1-27	156
Nineteenth " " 72		Rs.	1-17	161
Fourth Meridian		Tps.	61-115	165
Eighteenth base line west N. of Tp. 68		Rs.	1-12	176
Nineteenth " " 72		Rs.	1-26	179
Twentieth " " 76		Rs.	1-20	184
Twenty-first " " 80		Rs.	1-26	189
Twenty-second " " 84		Rs.	1-20	194
Twenty-third " " 88		Rs.	1-26	200
Twenty-fourth " " 92		Rs.	1-25	205
Twenty-fifth " " 96		Rs.	1-23	211
Fifth Meridian		Tps.	71-112	217
Ninth base line west N. of Tp. 32		Rs.	8-9	225
Tenth " " 36		Rs.	8-11	226
Eleventh base line west " 40		Rs.	7-19	227
Eighteenth " " 68		Rs.	1-19	230
Twenty-first " " 80		Rs.	1-18	235
Twenty-second " " 84		Rs.	1-20	239
Twenty-third " " 88		Rs.	1-26	243
Twenty-fourth " " 92		Rs.	18-21	249
Twenty-fifth " " 96		Rs.	18-21	250
Twenty-sixth " " 100		Rs.	18-20	251
Twenty-seventh " " 104		Rs.	9-22	252
Twenty-eighth " " 108		Rs.	1-4	254
Twenty-ninth " " 108		R.	18	254
Twenty-ninth " " 112		R.	1	255
East outline of range 18		Tps.	89-108	259
" " 22		Tps.	89-92	260
Sixth Meridian		Tps.	85-90	261
Eighteenth base line west, N. of Tp. 68		Rs.	9-14	263
Twenty-second base line west, N. of Tp. 84		Rs.	13-26	265
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# **PART I**

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**ACCOUNT OF THE LEVELLING OPERATIONS**

# ACCOUNT OF THE LEVELLING OPERATIONS.

## INTRODUCTION.

The operations referred to in this report comprise two classes of levelling which, although closely connected, are yet carried out under different conditions and by different methods.

One division of the work is concerned with the survey of the meridians and base lines of the Dominion Lands System of survey. The second division deals with lines of precise levels which are run to control the accumulation of such errors as are unavoidable in levels taken under the difficulties surrounding the survey of base lines, and also includes other lines of levels whose object is to afford much needed information in the partly settled lands.

In regard to the results obtained by all the levels, the present report deals more with elevations of natural features than with the more technical aspect of bench-marks and of the work done in precise levelling. As regards the levels along meridians and base lines, only the elevations of natural features are here recorded. Many thousands of bench-marks have been established along these lines and are now listed in accessible form, but they are not included in this report.

Along the lines of precise levels, however, all the permanent bench-marks are included and, in addition, many of the so-called temporary bench-marks. These latter, while not suitable for reference where great precision is required, yet are sufficiently stable and accessible to fulfil many useful purposes, especially in view of the previous want of knowledge of elevations.

Only a summary of the results is here given, more particularly in regard to the meridian and base-line levels. Many more elevations have been recorded in the field and are available as required. It has been difficult to decide a mean between the publication of too much and too little detail of elevations of natural features. For general purposes when the relief only of a district is needed elevations at comparatively long intervals are sufficient, but when information is required for some particular work, much greater detail is desirable. The compromise adopted in these lists has been to state the elevation of the ground at least once every mile at the foot of the iron post which is planted to mark each section corner. This is a tangible point easily identified on the ground. In addition the elevation of every stream and lake of consequence, crossed by the several lines, is given.

The lines of precise levels have been run as a rule over railway lines. The only elevations recorded on these lines during the first years were those of bench-marks and of railway stations, but in subsequent seasons the field records have been expanded to include all streams and road crossings, and, in addition, short branch lines are now run to large lakes and other features of special importance.

## SYSTEM OF SURVEY.

As the levels referred to are very closely connected with the survey of meridians and base lines, some account of the relation of these lines to the general survey in the western provinces is necessary to give a clear understanding of the levels.

The Dominion Lands System extends over the entire Northwest from the international boundary northwards and from the east of Manitoba westwards to British Columbia. It is at once the simplest, the most accurate theoretically and practically, and the most extensive system of survey followed in any country for subdividing new areas for settlement.

The first survey lines to be marked out on the ground are the meridians. The first, somewhat unfortunately named the principal meridian, for it has no greater authority than the others, commences at the international boundary at an arbitrary longitude ( $97^{\circ} 27' 09''$ ) and runs due north, passing a little to the west of the city of Winnipeg. The second meridian commences at the international boundary at longitude  $102^{\circ}$ , the third meridian at longitude  $106^{\circ}$ , and the others occur at similar intervals apart of four degrees of longitude. These intervals amount to about 182 miles at the international boundary, which is the 49th degree of latitude. The meridians, of course, converge as they go north by an amount depending on the latitude. South of latitude  $60^{\circ}$  they approach nearer each other about five and a half miles in every hundred miles of their length.

Each meridian is extended farther north independently of the others, according to the requirements of the general survey. The extent surveyed at the present date is as follows:—

Meridian.	Number of Township reached.	Miles Surveyed.
Principal.....	88	531
Second.....	80	483
Third.....	72	434
Fourth.....	115	690
Fifth.....	112	660
Sixth.....	90	256

In the case of the fifth and sixth meridians the mileage actually surveyed does not correspond to the number of the township reached. This is due to the southeasterly trend of the Rocky mountains, which results in the mountains crossing the longitude of these two meridians, so that they were not commenced at the international boundary, but were established at some point farther north.

The meridians being established sufficiently far north, the next lines to be surveyed are the base lines. These are long lines run west on six-mile chords of latitude from points on each of the meridians situated four townships apart. The side of each township being six miles with certain regular allowances for roads, this distance apart of the base lines amounts to a little over twenty-four miles. Townships are numbered from the boundary northwards. Ranges are numbered from each meridian westerly to the next meridian. In the case of the principal meridian, ranges are also numbered easterly. The expression "township 68, range 15, west of the third meridian" therefore indicates the 68th township counting northerly from the international boundary, and the 15th township counting westerly from the third meridian.

Base lines are also numbered from the international boundary northwards, the boundary itself, which is the 49th parallel of latitude, being considered as the 1st base. The 2nd base runs along the north of township 4, the 3rd along the north of township 8, and so on. The number of a particular base is therefore found by taking one-quarter of the number of the township and adding one. Conversely the number of the township along the north boundary of which a base line runs is obtained by deducting one from the number of the base and then multiplying by four. For example, the line running along the north of township 80 is the 21st base line. Similarly the 24th base line is that line which runs along the north of township 92.

Meridians and base lines form the sides of future townships. They are therefore marked out during their survey with reference to sections and quarter-sections. The line actually marked out is the westerly side of a road allowance in the case of a meridian, and the southerly side of a road in the case of a base

line. The lines are therefore described as being the east boundary or north boundary respectively of the particular section and township. The record of chainage commences anew for each section, the quarter post occurring at half a mile or forty chains, and the section post at one mile or eighty chains. The chain referred to is Gunter's chain, sixty-six feet or four rods long. The posts which mark section corners stand at the northeast corner of the section, only one side of a road allowance being posted. In the case of a meridian, the chainage commences at 0.00 at the southeast corner of each section and is continuous for eighty chains, when the northeast corner of the section is reached and the section post with its accompanying mound is there established. The allowance for road, where one occurs, is then laid off. No post is planted at the north side of the road, but the record of the next section begins anew at the north side of the road.

In the case of a base line a similar procedure is followed, the record of the chainage in this case commencing at the post at the northeast corner of the section and continuing westerly for eighty chains, when the northwest corner of the section is reached. The road allowance follows, and the section post is then established at the northeast corner of the next section to the west. The midway or quarter-section post is always established at forty chains.

When a post cannot be planted at a section corner owing to the presence of a lake or such circumstance a witness post and mound are established as near the true corner as possible. Certain rare exceptions to the above general rules occur, such as on correction lines.

When the meridians and base lines have been surveyed there results a system of lines actually marked out, each of which runs west across the country and is spaced at an interval of twenty-four miles, measured in a north-and-south direction from the next one. The subdivision of the intermediate areas into townships and sections follows according to the general rules of the System of Survey and is carried out in subsequent years as called for by the requirements of settlement.

The lines of the Dominion Lands System along which levels are run are the meridians and base lines above described. In a few exceptional cases levels have also been run over other townships lines.

#### PROGRESS OF WORK.

The system of taking spirit levels along meridians and base lines was inaugurated in the year 1908. The only previous attempt at recording elevations during the survey of these lines was made in the year 1905, when a continuous line of trigonometric levelling was carried for one hundred miles along the eighteenth base line south of Lesser Slave lake. The country there is exceptionally hilly, and the record of elevations was made by reading the angles of elevation or depression from one transit station to another, the stations averaging about half a mile apart along the line. The distances between stations being recorded during the ordinary measurement of the line, a simple computation gave successive differences of elevation. Such a method, while a good one when only a general knowledge of the relief of a district is required, and one which entails very little extra work, is yet not adapted to determining elevations of points intermediate between stations or to establishing bench-marks for future reference. When a complete record of the various topographical features is required, such as the elevations of streams and lakes and of points at regular intervals along a line, the only satisfactory method is to run a line of spirit levels. Moreover, unless a more accurate method than the reading of vertical angles is used in a system so extensive as that of Dominion Land Surveys the accumulation of errors carried on from one line to another would become so great as to seriously impair the value of the levels.

Elevations deduced from vertical angles are much exposed to errors arising from refraction and from want of precision in the graduated circle by which vertical angles are read. This is particularly the case in districts whose relief is flat or composed of long even grades. In such districts the line of sight passes low down over the ground where refraction is very uncertain and, in addition, the angles being small, a small error in reading them causes a large error in the computed elevation.

While trigonometric levels in comparatively flat country are not sufficiently accurate to form a basis for an extensive level system, yet even in such districts they have their purpose if, for any reason, spirit levels are not feasible. They are much more accurate than aneroid readings, and very much better than no elevations at all. The results gained by recording elevations by vertical angles during the survey of fundamental lines through new districts, though not comparable with the results of spirit levels, will well repay the small extra trouble involved.

It is becoming more recognized each year that a record of the elevations of a district is an essential part of the information which should be supplied by surveys, and especially by surveys in new districts. Without this record it is not possible to form a true estimate of the future development of a district. Such questions as the feasibility of constructing railways, the drainage of extensive wet areas, the improvement of rivers for various purposes, the presence or absence of water-powers, and many other matters on which the development of a district depends, cannot be decided in the absence of a knowledge of elevations. And such elevations must be known not only relatively among themselves, but absolutely with reference to sea-level.

While it is not, in general, the purpose of surveys, whose main object is concerned with dividing out land for settlement, to collect information of such a detailed nature as is necessary for actually carrying out special local enterprises, yet it is a legitimate part of such surveys to record enough information to assist a correct decision being subsequently reached regarding the possibility of such works.

Previous to the survey of meridian and base lines, hardly anything is known about the topography of a district in the western provinces. A mere inspection of the extensive blank spaces on the map before these lines are run will make this apparent. During their survey a good opportunity occurs for collecting information. Transportation is so difficult that if the opportunity of the presence of the survey party is lost, another opportunity cannot occur until the subsequent gradual advance of settlement may afford some means of getting a party on the ground. The difficulties of the survey of base lines are very great, and while the mere survey of these lines in advance of settlement is itself well worth the cost and trouble of overcoming these difficulties, yet every additional kind of information obtained is so much on the credit side without a proportionate increase in cost. This is markedly the case when levels are run concurrently with the survey. The party being on the ground already, the extra cost of the field work owing to levels being taken is little more than the salaries of a leveller and rodman. Not only is the cost proportionately small when compared with any subsequent means, but information regarding elevations is of more value the earlier it is known, and moreover if delayed till some future time, the elevations of some farther district may be held back owing to the want of connection over the whole system. The system must be considered as a whole, and every argument in favour of extending the system of horizontal measurements as regularly as possible over the whole country in advance of settlement and without too close consideration of immediate local needs, can be equally applied in favour of establishing lines of levels over every meridian and base line as it is being surveyed.

As may be readily understood by consideration of the circumstances, the levels run along base lines afford the very first information of elevations of the

various features of the country. These levels suddenly change a condition of affairs in which elevations were wholly unknown to a condition where they are known with a high degree of accuracy. The lines of levels are run twice, each mile being levelled in opposite directions, and if these duplicates do not agree within one-tenth of a foot to a mile, the mile is levelled again. As a practical thing this limit is seldom even reached, and in a long line the accumulated difference of the two levellings is required to be kept within the above limit multiplied by the square root of the distance in miles. Thus in one hundred miles the accumulated difference must not exceed one foot.

#### *Season of 1908.*

As already indicated, spirit levels were first run along base lines in the year 1908. In that year a total of 116 miles were run, of which forty-eight miles were along the third meridian from township 53 to township 60, and sixty-eight miles were along the 11th base line west of the fifth meridian from near Rocky Mountain House westerly. This system of levelling was begun with considerable doubt as to its feasibility. The conditions surrounding the survey of a long straight line which runs across an uninhabited country generally covered with timber, and with large areas of swamp, and in which there are no means of transport except the imperfect and temporary trails opened out by the surveyor for moving his camp, did not appear to be favourable to accuracy in levelling, and the surveyors themselves were inexperienced in taking levels. Moreover, the work being inaugurated after many of the lines had been already surveyed a considerable distance in advance of settlement, the first lines of levels would have nothing in the way of connection to a known elevation. The requirements of settlement had also resulted in the various base lines being advanced with an irregular front, extending much farther north in some districts than in others, so that the levels run along the new lines surveyed each year would be in different districts and unconnected among themselves. It would be too costly to reopen lines already surveyed in previous years to enable connecting lines of levels to be run, and it was apparent that some time must elapse before the system could be reduced to the common datum of sea-level. Lines would have to be run on an entirely assumed datum for several seasons until the ordinary progress of the survey of new lines afforded more connections.

The above considerations led to the work being undertaken gradually: but each season the mileage run has been an increase on that of previous years. Such a comprehensive system of levels run in districts far in advance of settlement is not duplicated in any other country. Its inauguration was entirely unprecedented. The results have fully justified the undertaking, and have shown that the natural difficulties of running spirit levels along survey lines in such districts can be overcome, and a high degree of accuracy can be attained without excessive cost and without delaying the other parts of the survey work. It should, however, be stated that the satisfactory results obtained have been largely due to the interest taken in the work by the surveyors and the effort they have made to keep the accuracy up to a high standard. Surveyors in charge of the survey of meridians and base lines are men specially selected, not only for their superior technical knowledge, but for their powers of organization in overcoming the natural obstacles surrounding surveys which are among the most difficult in the world. This aspect of the matter should not be lost sight of in considering the general question of the feasibility of establishing such lines of levels in new countries.

#### *Season of 1909.*

In the year 1909 a considerable increase in mileage over the first season was run, 613 miles being levelled. The third meridian was not advanced

this season, but levels were commenced on the fourth meridian at Primrose lake in township 67, and were carried up to township 80. This was then the farthest north to which levels had been run.

The fifteenth and sixteenth base lines were run from the third meridian to the fourth, but neither of these base lines connected the levels on the two meridians. This was due to the levels on the fourth meridian having been commenced a considerable distance to the north of where the westerly completion of the sixteenth base line intersected this meridian. The gap left along the meridian was levelled in the following season.

The other lines run this season were along parts of base lines to the west of the fifth and sixth meridians.

#### *Season of 1910.*

Eight parties were engaged this year on the survey of meridians and base lines and levels were carried out along all the lines excepting the fifth meridian. In this year the first levels were run in the country lying to the east of the third meridian, and consisted of forty miles along the principal meridian south of lake Winnipeg and 124 miles along the eighth and ninth base lines in the vicinity of the meridian and along the fifteenth base line north of Pas. Levels were also commenced during this season on the second meridian in township 56 and carried north to township 61. The third meridian levels were continued to township 64 and the fourth meridian levels to township 95. The other levels run consisted of parts of base lines west of the fourth, fifth, and sixth meridians.

No levels had yet been run along the fifth or sixth meridians, and it will be noted that the levels along the other meridians to the east had been commenced very far to the north. This, of course, was due to the meridians having been already surveyed for considerable distances to the north before levels were inaugurated.

At the end of the season of 1910, twenty-three different lines of levels had been run since the inauguration of levelling, making a total of 1600 miles. These were all run in the field on entirely different datum planes and no connection to any known datum was yet available for any of them. The only lines of the twenty-three which were even connected with each other were those in two groups, one group comprising the third meridian and the fifteenth and sixteenth base lines west of it, the other group including the fourth meridian and a few ranges surveyed along the eighteenth, nineteenth and twentieth base lines west of it. Even in the case of the lines forming these groups different datums were used in the field, subsequent reductions to the same datum being made in the office.

#### *Season of 1911.*

In the year 1911, nineteen different lines of levels were run along meridians and base lines making a total of 1326 miles for the season. These lines were spread over the country from the principal meridian to the northwest of Peace River Block, the westerly levels being thus in a district over one thousand miles away from the easterly ones. In this year levels were run over the fifth meridian. This meridian had been surveyed in the years 1910 and 1911 from township 71 at the crossing of Athabaska river to township 112 a little north of Peace river, but no levels had been taken during its previous survey. A special party was therefore sent out this season and levels were recorded over the whole line of 247 miles.

The 23rd base line was run right through from the fourth to the fifth meridian, forming the first connection between these two meridians. A large mileage was levelled in Peace River Block to the west of the sixth meridian,

but it was not until the end of the next season that any connection of these levels to a known datum became available.

A total of 2926 miles had been run by the end of the season of 1911. There were thirty-nine different lines of levels along meridians and base lines. The general progress of the survey had resulted in these lines being connected in separate groups as follows:—

Group	Locality.	Miles.
I	Along and near the principal meridian, south of Lake Winnipeg.....	101
II	Along the principal meridian north of lake Winnipeg....	72
III	Along second meridian and part of fifteenth base west of it.....	191
IV	Along third meridian and the fifteenth, sixteenth and seventeenth bases west of it.....	555
V	Along fourth meridian, all of the twenty-third base, and short parts of the eighteenth, nineteenth, twentieth, and twenty-fourth bases west of it.....	600
VI	Along the fifth meridian and parts of the twenty-first, twenty-second, twenty-eighth, and twenty-ninth bases west of it.....	503
VII	Along the twenty-second and twenty-third base lines in Peace River Block, the east outline of range 13, and part of the west boundary of Peace River Block.	243
	Fifteen other separate lines.....	661
	Total.....	2926

Nearly every one of these thirty-nine different lines had been run in the field on separate and entirely different assumed datum planes. None of the groups, except Nos. IV, V, and VI, were connected, and even in the case of these three groups the connection between them had only been brought about at the end of the season. Only one circuit had been closed. This was a circuit formed by the sixteenth and seventeenth base lines and the intervening parts of the third and fourth meridians. This first circuit closed well. The error was 1.50 feet in a distance of 356 miles, which corresponds to 0.08  $\sqrt{}$  miles.

In the latter part of the year 1911, and the following winter, three special lines of levels were run northerly from the nearest railways to connect with the southerly ends of the levels run along the third, fourth, and fifth meridians, the object of these special lines being to afford a datum for as many of the base-lines as possible.

One of these lines was run over the Montreal Lake wagon road from the railway at Prince Albert for thirty-three miles northerly to the southerly end of the levels along the third meridian. The second was a line eighty-three miles long and ran northerly from the railway at Lloydminster, following travelled roads to the southerly end of the levels along the fourth meridian. The third line was levelled over the ice of Athabaska river from Athabaska Landing for a distance of seventy miles northwesterly to the crossing of the fifth meridian. All these lines were run as ordinary levels with a dumpy level.

In the case of them all the only available datum at the start was that of the Canadian Northern railway. This, while not very accurate, yet supplied an approximate sea-level datum for the lines in groups IV, V, and VI, amounting to 1658 miles of levels for which there had previously been no known datum at all.

It was necessary to run the last-named line in winter, as there was no available route except over the ice on Athabaska river. In the following summer (1912) this line was connected with Edmonton by a line ninety-three miles long run as a precise-level line. The southerly half of this line was run along the travelled highway from Edmonton to Tawatinaw. From there the route followed was over the track of the Canadian Northern railway to Athabaska. This railway was then just constructed, but had not yet been opened for traffic. Travelled highways do not form nearly as favourable a route for running precise levels as can be obtained by running over a railway track. This is due to the uneven contour of a road which makes it difficult to keep the lengths of backsights and foresights equal, and is also owing to the general crookedness and narrowness of such wagon roads as exist in the partly settled districts. Running precise levels over highways is in general costly and unsatisfactory. Other important advantages of a railway route are the more even grades which always tend to eliminate error, and the extra speed gained by using a handcar during the actual progress of the work.

#### *Season of 1912.*

During the season of 1912 steady progress was made in the meridian and base-line levels, the large amount of 1,433 miles being run, raising the total of these levels to 4,359 miles. The levels along the principal meridian were extended during its survey from township 60 to township 72 and, in addition, 168 miles were run during a retracement survey of this meridian from the international boundary to township 28. Short distances were also run along several base lines in Manitoba.

Nothing was done on the second meridian, but the third meridian levels reached township 68, and the 18th base line was run right through from the third meridian to the fourth, forming the fourth connecting line between these meridians.

The fourth meridian was extended to the south shore of lake Athabaska in township 115. This is the farthest north to which spirit levels have ever been run. The line of levels along this meridian extends from township 60, a length of 327 miles, and is the longest absolutely straight line of spirit levels in the world.

The fourth and fifth meridians were further connected in this season by the completion of the 19th and 20th base lines, and the first connection between the fifth and sixth meridians was made by running the 23rd base line. At the present time this base line, which is 150 miles long, forms the only connection to sea-level for 1,100 miles of levels extending through the valley of the Peace river and west of this river to Peace River Block. This condition of all the levels in a locality being dependent on one connecting line for their datum exists at present in many parts of the system. It is a great weakness, but will disappear as new lines are surveyed.

The lines run along the meridians and base lines were still far from being connected, even among themselves, and additional special lines of levels to afford a general connection to sea-level were becoming imperative. In any event the area over which the system was extending was becoming too great for a single connection of some point on the base line system to sea-level to be sufficient to give a satisfactory datum over the whole. If accuracy was to be reached and maintained it could only be done by means whereby the accumulation of small errors could be cut out at several points distributed over the whole area.

To do this the first consideration was to find a favourable route over which to run a fundamental line of precise levels in a general east-and-west direction. Subsequently, branch lines of precise levels could be run northerly from points along it to the base lines, and such lines could be extended further north as opportunities offered.

These controlling lines, even though they follow in the rear of the base line levels, will keep down accumulation of error, the elevations previously recorded and listed along the base lines being periodically adjusted to agree with the precise elevations so soon as the controlling lines reach each successive base line. Thus, while a certain amount of error must exist in the north, error will be continually cut out farther south.

The most favourable route for such a fundamental line was furnished by the Canadian Northern railway, following the line from Winnipeg northwesterly past Dauphin, Hudson Bay Junction, and Prince Albert, and then southerly to Warman and westerly to Edmonton. Except in Manitoba, this route lay entirely to the south of the area covered by the base-line levels, but it was the most northerly and nearest railway available.

Routes suitable for running branch lines of precise levels northerly are at present few and far between, but new railway lines will continually be extended. Until such are constructed almost the only available routes in the northern districts are over the ice of some of the larger rivers.

Under usual conditions a circuit of base-line levels consists of a rectangle formed by two base lines and the intervening parts of two meridians. Two of the sides are therefore each about 156 miles long, and the other two sides are each twenty-four miles long, forming a circuit of 360 miles in all. This is a very long circuit for consideration in cases where, on closing, there are indications of error having occurred in some unknown part of the circuit.

Branch lines of precise levels which can be run so as to cut such large circuits in half are evidently the most useful, and this condition is best brought about by lines which run northerly about midway between the meridians. Peace river, Athabaska river, and Beaver river are especially well placed for such purposes. Already some 200 miles of levels have been run on the ice. The conditions are severe on the level party, and the available season in winter for safe work on a frozen river is comparatively short, especially so when the river is rapid; but in the almost entire absence of any other route much can be done by such lines to control and localize errors which have occurred in the base-line levels.

A short account of the precise levels which have been run over railway lines or along other routes is given later on in this report.

#### *Season of 1913.*

A very large amount of levelling was done along meridians and base lines in this season. The principal meridian levels reached the north of township 80, and a large mileage was run along several base lines east and west of this meridian in northern Manitoba. The most northerly line levelled was the 21st base, seven ranges of which were levelled easterly from the meridian. The activity in that district was due to the construction of the Hudson Bay railway. The survey of this railway affords almost the only case in the Northwest where other levels had been taken in a district before the base lines had been surveyed and levelled, though even in this case the base line levels were run across the route of the railway before the railway itself was constructed.

The 13th and 14th base lines were run easterly from the second meridian to the west shore of lake Winnipeg. These lines cross the line of precise levels

along the Canadian Northern railway from Hudson Bay Junction to Pas, and thus afford a connection to sea-level for lake Winnipeg.

The first direct connection between the levels along the principal and second meridians was brought about by the completion of the 16th base line between these meridians. These levels had previously been indirectly connected through the levels taken by the Hudson Bay railway engineers. It may be noted that at the present time the only connection to sea-level for all the lines in northern Manitoba is by a circuitous route to the west of lake Winnipegosis, and then northeasterly along the Hudson Bay railway. Lake Winnipeg itself does not form a reliable means of connecting the levels along lines to the north and south of the lake, owing to the variation in the height of the water.

Although the country in northern Manitoba is very swampy and much broken by many lakes, making it unfavourable for levelling, yet the closings of numerous circuits in that district have nearly all been good.

In the southern part of Manitoba nearly 400 miles of levels were run over the prairie this season during the retracement of lines which had been originally surveyed many years ago. Two hundred miles of this total were along the 2nd base line from the principal to the second meridian, and 144 miles were along the east outline of range 31 from the international boundary to township 24.

The second and third meridian levels were directly connected for the first time by the completion of the 15th base line. This base line had been run westerly in the year 1911 as far as range 21. Previously to its completion the levels on the two meridians had been connected by a circuitous route by means of the line of precise levels along the Canadian Northern railway from Prince Albert to Hudson Bay Junction, from the ends of which branch lines had been run northerly to the two meridians.

The closing of the 15th base did not agree at all with the previous connection and there appears to be a large error in this base line. It is being again levelled over.

The third meridian levels were extended to township 72, and the 19th base line was then levelled westerly for 102 miles, ending in range 17. This line crosses Ile à la Crosse lake, thereby affording a very important elevation in connection with Churchill river.

West of the fourth meridian much work was done this season. The 21st and 22nd base lines were run right through from the fourth to the fifth meridian, forming two additional closings, and the 24th and 25th base lines were run as far as Athabaska river.

The base lines over which complete lines of levels have already been run from one meridian to the next are as follows:—

Meridians.	Base lines Completed.
Principal to second.....	2nd base line. 16th “
Second to third.....	2nd “ 15th “ 16th “
Third to fourth.....	2nd “ 15th “ 16th “ 17th “ 18th “

Meridians.	Base lines Completed.
Fourth to fifth.....	19th base line.
	20th "
	21st "
	22nd "
	23rd "
	24th "
	25th "
	26th "
Fifth to sixth.....	23rd "
	29th "
Sixth westerly.....	23rd "

An important line was run in the vicinity of Peace river. This was the east outline of range 18 west of the fifth meridian, from township 89 to township 108. The base lines occurring between these townships were run off this outline for a few ranges east and west so as to cross the valley of the river. No other levels were run in the country west of the fifth meridian.

In all, 1,992 miles were levelled in the season, much the largest mileage of any season. This was due chiefly to work having been carried on during winter to a greater extent than usual, and also to the addition of the mileage along retracement surveys over the prairie in southern Manitoba.

*Season 1914, to October 31st.*

During this season the principal meridian has been extended to township 88, about thirty miles south of the crossing of Churchill river. The base lines in Northern Manitoba are being steadily advanced, and it is expected that a connection of the levels in that area to sea-level at Nelson on Hudson bay will be accomplished during this season. In the area bounded on the east by lake Winnipeg and the principal meridian, and on the west by the line of railway running from Hudson Bay Junction towards Nelson, all the base lines have now been levelled, excepting only a gap on the 15th base from range 5 to range 20.

Block outlines, consisting of parts of base lines and of intervening meridian outlines, are being run southerly near the east shore of lake Winnipeg. These levels should greatly assist the connection of the levels to the north and south of the lake.

A very large mileage of levels has been run over the prairie in the south along the second base line from the second to the fourth meridian during a retracement survey of this base line. These levels are now being continued northerly over the prairie along the fourth meridian.

No other levels are being run this season along base lines between the principal and second meridians. Between the second and third meridians the only line which has been levelled is the 16th base line, which has been completed between these meridians. It has been noted under season 1913 that the levels on the base line to the south of this one, namely, the 15th, when taken in conjunction with the connection of the two meridians by the line of precise levels from Prince Albert to Pas, showed a very bad closing. The closing of the 16th however, when compared with the same precise line, is remarkably good. Excluding the 15th base, and considering the large circuit composed of the 16th base, the parts of the two meridians and the precise line to the south and east, we have a total circuit of 540 miles, with a closing error of 0.51 foot. In the whole distance, 253 miles are precise levels, 287 miles are along the meridians and the base line.

It is true that, in ordinary levels, such a small closing error cannot be taken as proof that the local divergence from a true line is of the same small order as the closing error. A division of this large circuit into smaller ones would almost certainly disclose hidden errors. Yet such closings are strong evidence that no large local errors occur.

Between the third and fourth meridians no additional levels have been run this season, but west of the fourth a large amount of levelling has been carried out. The 24th and 25th base lines have been completed to the fifth meridian, and the 26th has been levelled right through from the fourth to the fifth meridian.

West of the fifth meridian the 26th and 27th base lines have been completed between that meridian and the meridian outline previously referred to as having been run north along the east of range 18 in the neighbourhood of Peace River valley.

The 29th base has been run from the fifth meridian westerly to the longitude of the sixth meridian. The latter meridian has not yet been surveyed north of township 90, which is 132 miles south of the ending of the 29th base. This base, which runs along the north of township 112 at a distance of 676 miles north of the international boundary, is the farthest north base line yet surveyed. The surveyor, when returning recently from his work, travelled over 400 miles southeasterly before he reached the nearest railway station.

The only other line levelled in the extreme northwest is a part of the west boundary of Peace River Block. The levels along it have afforded a much-needed connection to sea level for 180 miles of levels which were run in the southerly half of the block several years ago.

In the case of nearly all the lines levelled this season, the returns are either not yet received or are not yet sufficiently checked to enable their results to be finally arranged.

#### SUMMARY.

The total of all the meridian and base line levels run up to October 31, 1914, amounts to 7,767 miles. The territory through which they run may be described as extending about 900 miles westerly from eastern Manitoba, with an average width of about 300 miles from south to north. The distance, in a straight line, from the most southeasterly levels to the most northwesterly is 1,200 miles. The connection along the actual lines of levels between these extreme points is 1,460 miles long, every mile of which has been levelled along a meridian or base line.

Some 1,200 miles have been levelled during retracements of former surveys in settled or partly settled areas in the extreme south of the territory. All of the remaining 6,567 miles have been levelled in advance of settlement, and before any other surveys were made.

Table II, at page 31, contains an historical summary of the various lines run in each season from the year 1905 to October 31, 1914.

Table III, at page 36, gives a list of all the lines arranged in the order in which they occur over the territory from east to west and from south to north.

#### FIELD METHODS AND INSTRUMENTS USED ON MERIDIAN AND BASE-LINE LEVELS.

The instrument hitherto used is of the type known as a dumpy level, that is to say the telescope is permanently mounted on the vertical axis and cannot be revolved around its longitudinal axis as in the type designated wye levels.

The telescope is fourteen inches long with inverting eyepiece and an objective of one and a half inches diameter. The magnifying power is twenty-two diameters. The level vial is five inches long with a value of ten seconds for

each division. The diaphragm has one vertical wire and three horizontal wires. The middle horizontal wire is the only one read on the rod, and it would be better if the other two wires were abolished to avoid error. Three wire readings are only advantageous when the ground is very steady and a recorder is available as in precise levelling. Without a recorder the leveller must remove his eye from the telescope to enter each of the three readings in the field book, and on unsteady ground the process is very unsatisfactory. A careful reading of one wire only, with the bubble exactly in the centre, gives the best results in ordinary levelling.

The tube containing the vial is set beside the telescope, and the bubble read by means of a mirror. In addition to the three foot-screws, a micrometer screw is provided underneath the eye end of the telescope, this being used to make final adjustment when the rod is read.

The levelling rod is graduated in black and white to read hundredths of a foot, and is of the general type known as a Philadelphia rod, but is wider than usual, the width being two and a half inches. It is in two pieces, which slide together and extend to thirteen feet. So far as actual field use goes, a one-piece rod would be better, but it would be quite impossible to carry a rod thirteen feet long out to the work, as the only means of transport on a long journey consists of pack horses.

The general instructions for levelling along meridians and base lines are given below, and fully explain the field methods and records required:—

#### GENERAL INSTRUCTIONS FOR LEVELS ALONG MERIDIANS AND BASE LINES.

##### MAIN LINE OF LEVELS.

1. The elevations to be recorded are the surface of the ground at the foot of all section and quarter-section and witness posts (the top of trench in the last case) and at a point about midway between posts, the surface of water in all lakes, ponds, and streams crossed by the line, and of water in large swamps, noting that it is swamp water. The elevation of water in swamp may vary considerably over an apparently level surface. It is desirable that the intermediate points taken between posts be at twenty and sixty chains unless there is some marked local reason for the contrary. The elevations of the transit stations should also be noted. The above are sufficient to define the general surface, except in unusual cases.

2. The elevation of the ground is to be recorded at the intersection of all survey lines, roads, and important pack trails. If a railway survey line is crossed, connection is to be made to any railway bench-mark which can be found, and in addition the surface of the ground should be recorded at the nearest railway chainage stakes.

3. In the case of ice-covered lakes and large rivers, it should be remembered that the surface of the water in a hole cut in the ice, and not the top of the ice, represents the true elevation at the time of survey. If, however, the water floods over the ice, a hole should be cut elsewhere.

4. As the levels follow a straight line across country, making it frequently impossible, on account of local hills, to individually equalize backsights and foresights, attention should be paid to rough adjustment of these lengths so that their separate sums will not vary to a dangerous degree. Such adjustment should be, as far as possible, carried out for each individual division.

5. In having the chainmen record positions or leave tallies for the leveller, care should be taken that such work is not allowed to interfere with the continuity of the chainage of the quarter-sections. It should be done between pins as intermediate work.

##### CHECK LEVELS.

6. The levels should be checked by running a second independent line. This line should be run in the opposite direction to the first unless some strong reason prevents. When the two lines are run by the same leveller, one line must be completed over a division before the other line is commenced. The check levels should be entered on the pages marked for the purpose, the check line being entered on the page following the corresponding first line when such is practicable. In running the check levels it is not desirable to make any readings except at turning points and bench-marks. The difference between the first and check lines should not exceed 0.10 foot  $\sqrt{\text{distance in miles}}$ . If greater, a third line should be run. It will be noted that this limit may be quickly exceeded over a long line, even if the errors over individual divisions do not exceed it, should these errors have a marked tendency in one direction. Note should therefore be kept of the sign of closing errors.

7. Whenever a closing clearly indicates a large accidental error, such as reading the feet wrongly, it should not be considered that this error occurred in some particular place in one of the lines, with the result that the other is retained, but a third line should be run which is independent of the uncertainty.

8. The last foresight at the end of a forward line must not be used as the first backsight of the check line. The instrument is to be set up in an entirely new position before the check line is commenced, so that these two rod readings shall differ by at least a foot.

9. The main and check lines should be run with equal care in regard to difference of terminal elevations, so that the mean determination may be used after the books have been sent in, if such is considered advisable, but the surveyor is to carry the elevation forward according to the main line only.

#### BENCH-MARKS.

10. Bench-marks should be established at suitable intervals not greater than one mile. It is desirable that they should be placed close to section, quarter-section, or witness posts, this resulting in facility of reference and very much greater ease in subsequent identification. Their positions should, as far as possible, be recorded in the notes with reference to the posts, and not with regard to the general chainage of the line. The corner being first established, the position of a neighbouring bench-mark is best recorded by measuring the distance along the line in either direction from the post (taking no account of the presence or absence of a road allowance) and then measuring the offset. Where a witness post occurs, the position of the neighbouring bench-mark should be referred to the witness post, and not to the true corner. Posts should be recorded according to their marking, this being entered as actually found by the rodman, and not according to the leveller's idea of what it should be.

11. The best bench-marks are those on solid rock or on a very large boulder standing on the top of the ground. A large boulder, much the greater part of whose bulk is below the surface and firmly fixed may also form a suitable bench-mark, though liable to the effects of frost. The mark "T" should be cut with a cold chisel where the rod is held. Bench-marks may be placed on trees where nothing better is available, the tree being blazed and the letters B.M., with the number of bench-mark being cut on the blazed part. The elevation recorded is that of a six inch nail driven horizontally into the tree immediately below the blaze, and left projecting about one inch. Bench-marks must not be placed on stumps or hubs unless nothing else is available. A mere embedded large stone is not any better than a good tree, though better than a stump or hub.

12. When no bench-mark has been established on solid rock or on a very large boulder, nearly as permanent as solid rock, for a distance of four miles, a bench-mark is to be established which consists of an iron post three and a half feet long, with a plate attached to its lower end. A hole having been made, the post is firmly planted so that the top stands about ten inches above the surface of the ground, and the hole is then filled in and tamped. Some form of post hole digger works well for summer use. In winter a hole must be made by other means. The post has the letters B.M. with the number of the bench-mark cut on it. The elevation to be recorded is the top of the post. Such posts are to be placed exactly on the line, but may be placed anywhere along the line, so long as they are not nearer than three chains to any section, quarter-section, or witness post. The best location is on a dry ridge, but the absence of dry ground is not sufficient reason for omitting this B.M. Such a B.M. may be recorded in the notes as "I.P. and plate."

13. Near the crossings of all rivers of importance, and the shores of all large lakes, a bench-mark is to be established on rock or on some very large boulder, if available, or else on an iron post and plate. Such bench-marks should be placed in the lower lands, as near the water as considerations of permanence will allow. They may be a considerable distance from the line.

14. As far as possible, bench-marks should be used as turning points and as the ends of divisions, but when this cannot be done the bench-mark must be read on both the main and check lines.

#### ADJUSTMENT OF INSTRUMENT.

15. A good dumpy level should remain in adjustment throughout a season, yet its adjustment should be watched, and a test made about once a week during the regular course of the levelling, and recorded in the field book. The following method is recommended, and it is desired that it be used to ensure uniformity in the records. Having taken the reading of the backsight, let the rodman hold the rod an inch or half an inch from the eye end of the telescope on a peg X. Look through the object end of the telescope and, by means of a pencil set on the rod at the centre of the field of view, read the height of the instrument. Call this reading a. Read the foresight, which for this purpose should be about 300 feet distant, and call this reading b. Then set the instrument up at the foresight so that when levelled up, the eye end may be as before, about an inch or half an inch from the rod, and read the height of the instrument which call a'. Then take a reading of the rod again held on X and call it b'. The distance d in feet may be read from the stadia points of the rod at either set up

We have then for the deviation of the line of sight in the distance  $d$ .

$$D = \frac{(a+a')-(b+b')}{2}$$

and for any other distance, such as  $d'$  the error would be  $D \frac{d'}{d}$ . When the quantity  $D$  is positive the line of sight dips below the horizontal.

16. No adjustment is advisable unless the quantity  $D$  is over 0.02 foot for a distance of 300 feet, reliance being placed on equalization of the sum of the backsight and foresight distances, rather than on constant interference with the adjustment. It is to be noted that no adjustment, no matter how accurately done, can compare with this equalization, and without equalization an error in adjustment too small to be detected, may cause large errors in a very short distance.

17. In order to adjust:—To get the correct rod reading for the true horizontal line of sight, the quantity  $D$  should be applied to the last rod reading  $b'$  according to sign. Without moving the instrument from its last place, the rod is again held on the peg X, and the line of sight of the telescope is raised or lowered by means of the micrometer screw under the eye end until the middle wire intersects the correct rod reading. The level vial is then adjusted by its capstan screws so that the bubble stands exactly in the centre. The whole operation should then be repeated as a check.

18. The origin of the datum used should be clearly stated in the first book of each line, the information given in this matter in the surveyor's instructions being copied in full into the book. When a line is continued from one book to another the particular elevation carried forward should have a note to that effect in both books.

19. The name of the leveller and rodman should be stated on the title page. The leveller should enter his initials on every page. These initials signify that the leveller certifies to the correctness of the rod readings and other field entries. The surveyor is requested not to subsequently erase any entries. If he finds a correction necessary he should score out the previous entry and enter his own initials at the new one. If the whole page is a copy, not certified by the leveller, the prefix "Sgd." should be entered before copying the leveller's initials.

20. The direction of running should be entered on every page, both of main and check levels. The date of each day's work should be entered on the right-hand page opposite the first rod reading, and the dates for the whole page be subsequently entered on the proper line at the top of the left page. The year should be clearly stated in full on the title page.

21. Descriptions of topographical features should be entered so that the level books are complete in themselves, and that reference to the field books is not necessary. Thus, the expression "water in creek" with no chainage given is not sufficient. The chainage should be obtained from the field notes of the chainmen and entered, either at the time or subsequently. Where the line crosses a lake or river the chainage of both shores should be stated, and where the crossing is complicated an approximate sketch should be entered in the book, particular attention being paid to the location of section lines.

The surveyor should use his discretion as to whether it is advisable to have the leveller reduce the elevations of all or any of the intermediate sights. If the leveller is pressed for the time, these reductions can be made after the books have been sent in.

22. Bench-marks on stumps must be distinguished in the notes from bench-marks on trees, the word "stump" being added. If only the kind of tree is stated, it will be assumed to be marked on a growing tree. The word "rock" should be used only for solid rock.

23. The lettering or numbering actually cut on bench-marks should be stated, as a general note for the whole line. If the general rule is not followed in an individual case, note should be made.

24. Positions of bench-marks near posts should be recorded with reference to the post. Thus, "Nail in 10" poplar 1.12 chs. W.; 15 lks. S. of I.P. 33. 88. 6." "On houlder 3.10 chs. E.; 17 lks. N. of Wit. I.P. Mkd. 15 E., 35. 88. 7." Arabic figures make a better record than Roman figures. The offset between the centre of the line and the B.M. must be recorded in addition to the distance along the line. Distances and offsets are to be measured, not estimated.

25. The attention of the surveyor is particularly called to the necessity of following the "specimen page" in entering the rod readings. The entry of the chainage (where taken) on any point, the F.S. read on that point, the elevation it gives rise to, the B.S. on the same point, and the H.I. it gives rise to, and any topographical notes referring to the point on the right hand page, should be all entered on the same line. In the case of the first line on each page no F.S. is entered, and on the last line no B.S. is entered. The last elevation is repeated at top of next page, so that the F.S. and B.S. taken on this point occupy two lines; but under no circumstances should a B.S. and F.S. taken on different points occupy the same line.

26. Special care should be taken to avoid any clerical errors when transferring the elevation from the foot of one page to the top of the next one. When the page ends a division of the levels, such an error is not disclosed by the check levels.

27. When entering check levels it is only necessary to enter the numbers of the bench-marks at the extremities of the check lines and the rod readings on backsights and foresights. It is not only much less trouble, but very much better, not to reduce the intervening H.I. and elevations, the check being worked out solely by taking the difference of sums of B.S. and F.S. readings.

28. The closing error found when checking should be stated as a separate entry, with its proper sign. This closing error is deduced as follows:—

(a) Set down the difference between the sum of backsights and the sum of foresights on the main line of levels.

If the sum of the backsight readings is greater than the sum of the foresight readings, the forward bench-mark must be higher than the back bench-mark, and vice-versa.

(b) Set down under (a) the difference between the sum of backsights and the sum of the foresights on the check levels.

If the check levels are run (as they should be) in the opposite direction to the main line, then in the check levels when the sum of backsights is greater than the sum of foresights the forward bench-mark (in the main line) must be lower than the back bench-mark and vice versa.

(c) The closing error is the difference between (a) and (b), and is positive when the result of the check levels would make the forward bench-mark (in the main line) higher than the main levels make it, and negative when the check levels would make it lower.

By following the above rule the sum of the positive closing errors at any time indicates that the check line would have made the last bench so much higher, and the sum of the negative closing errors would have made the last bench so much lower.

29. A record of the rise or fall between the ends of successive divisions, and of the discrepancies found between the main and check levels, is to be entered from day to day in the pages reserved for this purpose. The continued sums of such of these entries as will act as a check on the whole should be noted in order to avoid carrying forward clerical errors.

30. Separate books should be used for lines entirely separate, such as different base lines or lines whose main course is entirely different. If more than one line should happen to be entered in one book, any such additional line should be copied subsequently into a separate book. A note should be made where a line is ended for the season.

31. Surveyors are requested before sending in their Level books, to number them all consecutively, the preference being for a system whereby all books referring to one line follow in order of running, and then those of other lines without any break in the numbering. An index of the books referring to such numbers is requested.

32. Surveyors are reminded that a very few minutes spent each day by the levellers in reviewing their day's work and filling in any notes or explanations saves very great difficulty in subsequent examination and adds much to the value of the levels for future use. The entry of such notes by their levellers should be insisted upon.

33. A fair copy of the notes is not desired, and the actual level books used in the field should be sent in as returns. If, however, the field books, from being exposed to the weather, are not clearly legible it is preferable that a fair copy be sent in, marking the page or book "copy." The word "copy" means any page or book which is not the one on which the original record was made when the rod was read. Copies certified by the leveller should be initialed by him.

#### DEGREE OF ACCURACY OF MERIDIAN AND BASE-LINE LEVELS.

The General Instructions require that the accumulated discrepancy between the duplicate lines run in opposite directions over each section be kept within the limit of 0.10 foot  $\sqrt{\text{miles}}$ . In practice the actual discrepancy averages about 0.05 foot in a mile section. This test of the real accuracy is, however, not so severe as the test of the closing of a circuit. The real accuracy of a line of levels is seldom as good as would be indicated by the discrepancy between duplicate running. The lines are run by the same man, and certain small errors due to personal and other causes will occur to somewhat the same extent in the duplicate lines, and so remain concealed.

It is to be noted also that while the practice of running duplicate lines in opposite directions tends to cancel some errors when the mean of the two lines is taken, yet there are other errors which cannot be brought to the surface even by such means. For example, when the line passes up or down a hill the unavoidable inequality in the lengths of backsight and foresight distances is repeated in the two lines in such a way as to conceal the error. The result is that no discrepancy between the duplicate lines may appear while really both lines are equally in error. The fact that in another case farther along the line the condition of going up or down hill may be reversed tends, of course, to minimize the accumulation of such errors, but the adjustment of the instrument and the state of the atmosphere may not be the same as they were in the former case.

Duplicate lines in ordinary levels cannot be regarded as much more than two measurements, the mean of which may, or may not, cancel errors occurring in the lines. In precise levels, on the other hand, there are distinct reasons for

considering the mean of duplicate lines as considerably more accurate than either of them.

In the case of the levels taken along meridians and base lines during their survey, it is to be remembered that the surroundings are seldom favourable to accuracy, and especial care must be taken to minimize the effect of the surroundings as much as possible. In practice, more difficulty is experienced in keeping certain individual miles within the limit of 0.10 foot than in keeping the accumulated discrepancy for a long line within the limit of 0.10  $\sqrt{\text{miles}}$ . When the ground is firm and the air steady it is easy to keep within the limit of 0.10 foot in a single mile, but a large percentage of the work is not done under these favourable conditions. Frequently large swamps must be crossed, necessitating setting up the legs of the instrument on three small piles driven into the ground. Even with this precaution it is often impossible to secure steadiness, and great care must be taken in having the bubble placed exactly in the centre by the micrometer screw at the moment when the rod is read. If this is done the effect of the swampy surroundings will be restricted to any change in the absolute height of the instrument which may occur between reading the backsight and the foresight. This latter is generally small. The mirror attachment greatly assists the accurate placing of the bubble in the centre but, owing to the fact that a certain small time must elapse between serving the bubble and the rod, the mirror arrangement is not so good as a recent improvement by which the bubble can be observed by one eye while the other eye is placed at the telescope.

Even with all precautions it occasionally becomes necessary in very bad swamps to use sights so long that the divisions on the rod cannot be read, and recourse must be had to the target, signals to the rodman being used until its centre is placed exactly on the cross wire. This is the only occasion on which a target is used. Extensive swamps undoubtedly cause unfavourable results, but their effect can be kept within the limit of error allowed if the utmost care is used in keeping the bubble in the middle when the rod is read. In accelerating the work across swamps a great deal is gained by having an extra man whose duty it is to prepare and drive stakes on which to set up the instrument.

Another serious source of trouble is an unsteady condition of the atmosphere. This occurs in all levellings. It is probably not any worse on meridians and base lines than on other levellings, except that the exigencies of work on these lines do not, as a rule, allow cessation during the hours of the day when the atmosphere is at its worst. The unsteadiness is not great, as a rule, when the line is running through heavy timber, but where the country is swampy and open it is often very bad just at a time when the men cutting out the line are making quick progress.

#### CLOSINGS OF CIRCUITS.

In regard to the closing errors of circuits of meridian and base-line levels, ten separate circuits, including only such lines, have already been closed, and in addition there are six separate circuits, one side of each of which is formed by the levels taken by the Hudson Bay railway engineers during the construction of that railway, this being the only case of a railway line crossing the meridian and base-line levels in the north.

The details of the circuits are given in the following table. In the case of the circuits between the fourth and fifth meridians the closings of the 20th and 21st base-lines are omitted owing to error having been found in these two base-lines and the larger circuit comprising the area between the 19th and 22nd base-line is substituted. The closing of this large circuit is very remarkable, and it will be noted that the next closing to the north, namely, the circuit between the 22nd and 23rd base-lines, confirms the belief that the levels in this district are very accurate.

The sides of each circuit are enumerated round the circuit in the direction of watch hands. The positive sign of error indicates that the final elevation reached for the initial bench-mark is higher than the original elevation.

In the case of circuit No. V which involves the Hudson Bay railway levels, and of Nos. VII and VIII involving only meridian and base-line levels, no computation of the closing error per mile is given, as gross errors evidently exist in these circuits.

TABLE I.—Closing errors, meridians and base lines.

Circuit.	Sides.	Miles.	Closing error.	Per mile.	Per $\sqrt{\text{miles}}$ .
<i>West of Principal Meridian.</i>					
I.	15th Base Rs. 27-31.....	28			
	2nd Mer. Tps. 57-60.....	24			
	16th Base Rs. 22-31.....	57			
	Hudson Bay Ry.....	39			
		148	-1.14	0.008	0.095
II.	16th Base Rs. 1-22.....	129			
	Hudson Bay Ry.....	55			
	17th Base Rs. 1-13.....	13			
	Prin. Mer. Tps. 61-64.....	24			
		283	-0.98	0.003	0.058
III.	17th Base Rs. 1-13.....	75			
	Hudson Bay Ry.....	42			
	18th Base Rs. 1-8.....	44			
	Prin. Mer. Tps. 65-68.....	24			
		185	-0.79	0.004	0.056
IV.	18th Base Rs. 1-8.....	44			
	Hudson Bay Ry.....	39			
	19th Base Rs. 1-3.....	13			
	Prin. Mer. Tps. 69-72.....	24			
		120	-1.94	0.016	0.176
V.	19th Base Rs. 1-3.....	13			
	Hudson Bay Ry.....	17			
	Prin. Mer. Tps. 73-74.....	10			
		40	-1.86	.....	.....
VI.	20th Base Rs. 1-3.....	15			
	Hudson Bay Ry.....	22			
	Prin. Mer. Tps. 74-76.....	14			
		51	+0.47	0.009	0.066

TABLE I—Continued.

Circuit.	Sides.	Miles.	Closing error.	Per mile.	Per $\sqrt{\text{miles}}$ .
<i>West of Third Meridian.</i>					
VII.	3rd Mer. Tps. 57-60.....	24			
	15th Base Rs. 1-7.....	38			
	Delaronde lake .....	0			
	16th Base Rs. 1-8.....	48			
		110	+5.07	.....	
VIII.	Delaronde lake.....	0			
	15th Base Rs. 7-26.....	114			
	Ministikwan trail.....	33			
	16th Base Rs. 9-25.....	100			
		247	+0.78	0.003	0.049
IX.	3rd Mer. Tps. 61-64.....	30			
	16th Base Rs. 1-27.....	160			
	4th Mer. Rs. 61-64.....	24			
	17th Base Rs. 1-27.....	154			
		368	+1.50	0.004	0.079
X.	3rd Mer. Tps. 65-68.....	24			
	17th Base Rs. 1-27.....	154			
	4th Mer. Tps. 65-68.....	24			
	18th Base Rs. 1-27.....	150			
		352	+3.43	0.010	0.182
<i>West of Fourth Meridian.</i>					
XI.	4th Mer. Tps. 73-84.....	72			
	19th Base Rs. 1-26.....	156			
	5th Mer. Tps. 73-84.....	72			
	22nd Base Rs. 1-26.....	152			
		452	+0.52	0.001	0.026
XII.	4th Mer. Tps. 85-88.....	24			
	22nd Base Rs. 1-26.....	152			
	4th Mer. Tps. 85-88.....	24			
	23rd Base Rs. 1-26.....	150			
		352	+0.27	0.001	0.014

TABLE I—Continued.

Circuit.	Sides.	Miles.	Closing error.	Per mile.	Per $\sqrt{\text{miles}}$ .
<i>West of Fifth Meridian.</i>					
XIII.	23rd Base Rs. 18-21.....	24			
	E. of R. 22 Tps. 89-92.....	24			
	24th Base Rs. 18-21.....	24			
	E. of R. 18 Tps. 89-92.....	24			
		96	+6.91		
<i>West of Sixth Meridian.</i>					
XIV.	N. of P. R. Blk. Rs. 13-20.....	77			
	E. of R. 13 Tps. 85-88.....	24			
	22nd Base Rs. 13-26.....	79			
	W. of P. R. Blk. Tps. 85-88.....	24			
		204	+1.16	0.006	0.080
	Average of eleven circuits.....			0.006	0.080

In considering the closings it is to be remembered that all the lines of levels have been run through country which is practically uninhabited, and amid very great natural difficulties, and that these levels are not intended to be precise levels, the aim being only to keep such an extensive system of levels free from any errors, local or accumulated, which would make their accuracy inferior to what is required for engineering works such as drainage, construction of railways, etc.

The majority of the closings show a smaller error than the limit specified in the General Instructions and, where this limit is exceeded, the evidence tends to show the excess is due, not to an accumulation of small inaccuracies, but to the presence of some large local error. The conclusion would seem to be that the limit of 0.10 foot  $\sqrt{\text{miles}}$  can be readily maintained, even in the difficult surroundings, if large accidental errors can be avoided. The presence of such errors shows that duplicate running cannot get rid of this danger.

There can be little doubt that the chief source of such large accidental errors is the failure to really check certain dangerous breaks which may occur in the continuity of the levels. The lines may be checked in sections, but it may sometimes occur that certain connections have never been really checked at all. Levellers are very prone to treat the entrance of a large accidental error into their work as a remote contingency, but the closings of circuits show that this is an ever present danger.

It is somewhat remarkable that the signs of the closing errors are positive in all the circuits except Nos. I to V, all of which have the Hudson Bay railway as one side. The circuits have not been levelled round their course in one direction, the almost universal rule being that the meridians forming the east and west sides of a circuit have been levelled from south to north, and both the base lines from east to west. The circuits may therefore be regarded as

the closings of two lines of levellings run round opposite sides of a rectangle, each of the lines commencing at the southeast corner and ending at the northwest corner. If the persistence of the positive sign is not a mere chance (as is almost certainly the case) it would indicate that the levelling following the east and north sides falls continually below the levelling following the other two sides. It may be noted, as bearing on this question, that no circuits have yet been closed which lie on opposite sides of the same meridian.

A further interesting fact may be here noted which has been observed to a considerable extent in running precise levels. When a line has been levelled for a considerable number of miles in one general direction, and a sudden change occurs to another direction, a marked variation almost immediately shows itself in the rate of accumulation of the discrepancy. It has been found that a line of precise levels running in a north or south direction will generally show a smaller accumulation than one running east or west. The cause is probably due either to the difference of illumination of the fore and back rods or else to the direct effect of the sun's position on the instrument. If so, it would follow that a line running east or west would show a greater discrepancy, with a more accurate mean, than would be the case with a line running north or south in which both duplicate lines would be equally affected by light and sun and equally in error.

In the case of circuit No. I in the table, the railway forms the easterly side of the circuit. Commencing with the same elevation at the intersection of the railway and the fifteenth base line near Pas the sign of the closing shows that when the sixteenth base is reached the railway elevations are 1.14 feet higher than the meridian and base-line elevations. The respective distances levelled are 39 miles and 109 miles.

In circuits Nos. II to V, all north of the sixteenth base, the railway forms the westerly side of every circuit, while in No. VI it forms the easterly side. The closing errors of all the five circuits indicate that the railway elevations fall steadily in comparison with the meridian and base-line levels at every successive crossing as we go northeasterly along the railway. The accumulated difference between the crossing of the 16th base, forty-three miles from Pas, and the crossing of the 20th base line east of the principal meridian, 175 miles farther on, amounts to 6.04 feet. The accumulation is so uniformly of one sign that it appears the difference must be due to some systematic cause and not to an accidental one.

Between the third and fourth meridians the closed circuits lie between the fifteenth and eighteenth base lines. While the individual closings are fairly good, yet the fact of their signs being all positive causes a marked accumulation of error as we go from the southeast to the northwest of this area. In a total outer circuit of 448 miles the accumulation amounts to 5.71 feet.

Five base lines have been completed between the fourth and fifth meridians. The closings of the nineteenth, twenty-second and twenty-third base lines agree remarkably well, while the twentieth and twenty-first base lines show discrepancies of 6.50 feet and 8.80 feet, respectively. Considering the area bounded by the two meridians and the nineteenth and twenty-third base lines, the accumulated error from the southeast corner to the northwest corner is only 0.79 foot. This circuit is 498 miles long.

The country in this district is, as a rule, only undulating, though changes in elevation of several hundred feet occur, and all of the base lines cross the rough valley of Athabaska river. The twenty-third base runs through many very rough areas. It follows the side of the valley of Clearwater river which is much broken by valleys of tributary streams, yet the accuracy of this line is as good as any of the lines run through more level districts, and it may be stated as a general rule that far more depends on the leveller than on the country in which he may be working. The results of the lines run through rough districts are fully as accurate as those through more favourable localities.

Circuit No. XIV is a very good closing in an exceptionally rough district, much broken by local valleys many hundreds of feet deep.

Circuits Nos. VII and XIII are notable examples of the occurrence of incomprehensible errors of large amount in short circuits in spite of duplicate levellings. These errors have not been localized. Two of the sides of circuit No. XIII cross the very rough valley of Peace river, which is 600 feet deep and 2 miles wide. Some error may have occurred there, though experience shows that large errors are not more probable in rough than in level country, and in the case of circuit No. VII the country is only undulating.

In ordinary levels it appears that small errors must, to a great extent, balance one another in a large circuit, for when such circuits are cut up by additional levellings into smaller circuits the resulting closings in the smaller ones are frequently less accurate, even in proportion to the square root of the length, than was the case in the original circuit. In ordinary levels the accumulation of accidental error rises and falls very rapidly, and if such levels can be kept free of gross local errors the practical accumulation over long distances is wonderfully small when compared with the local deviation of stretches of a few miles from a true line. The small ratio existing between systematic and accidental errors is, in fact, a marked characteristic of all levelling.

#### WORK OF REDUCTION IN THE OFFICE.

The work in the office, in connection with meridian and base-line levels, includes checking all the reductions in the field books, applying the necessary constants to reduce the elevations of each line to the datum of sea-level, compiling lists of bench-marks and lists of elevations of natural features and making profiles of the lines.

There has, hitherto, been much complication to be overcome in connecting the various datum planes on which the lines have been run in the field. They have been so dependent on complex connections, and there have been so few cases of independent check lines that the utmost care has been required to avoid clerical errors which might be undetected until a large amount of detail work had been done with the result that many hundreds of miles would have to be revised. The datum planes of the field work have frequently been based on a series of connections of one assumed datum to another, working back in some cases through as many as ten different lines before a line, subsequently levelled up from the south with a sea-level datum, became available.

Much the greater part of the complication has been caused by the fact that levels were not inaugurated until after many of the meridians and base lines had been surveyed a considerable distance to the north, so that while the new lines, on which levels were run, had connections in regard to horizontal measurements with the lines to the south they had no connection in regard to their elevations. When connections did subsequently come, in the ordinary course of running levels along new surveys, such connections were frequently very circuitous. Even at the present time there are several isolated lines of levels, aggregating over two hundred miles, which although run five or six years ago have not yet been connected to a known datum.

This trouble is, however, now largely a thing of the past. During the present season every surveyor has been supplied with an elevation referred to sea-level on which to base his field records. It is, of course, true that the elevation supplied is subject to revision should errors along the many lines on which it is based come to light but, in the future, the corrections to be applied in the office to the field elevations will more and more be restricted to small quantities only.

In the lists in part II the elevations of natural features along such of the lines as are not parts of closed circuits are stated as they have been recorded in the field, no change having been made except to apply corrections for clerical

errors and the general constant to reduce each line to sea-level. An adjustment has, however, been applied in the case of those lines which are parts of closed circuits, excepting where the closing has been brought about by the Hudson Bay railway engineers' levels. In this latter case no adjustment has been made, the elevations being given as recorded by the base line and meridian levels. The adjustment has been computed by a least square adjustment of each local net, these generally consisting of three or four adjoining circuits, each comprising two hundred to three hundred miles of levels. The resulting corrections have been applied to the field elevations in tenths of a foot proportionally to the distance of the several points along each line. The field elevations having been also recorded to tenths, the result should be accurate, as regards office computation, to the nearest foot.

It may seem fictitious to apply least squares to adjust elevations of natural features in circuits, some of which have greater errors than can have accumulated from accidental causes, but some adjustment has been necessary to avoid abrupt changes along the neighbouring parts of two intersecting lines, and the method of least squares is, in practice, nearly as easy as any other method.

In reducing the elevations to the datum of mean sea-level, the basis used has been an elevation of 1,679.88 feet assigned to a certain bench-mark at Warman, in Saskatchewan, which has been connected with the United States Coast and Geodetic Survey.

In some few cases in the lists of elevations of natural features, an elevation of a lake or stream in the neighbourhood of a line is recorded as being estimated. It should be understood that, in all such cases, there have been good grounds for knowing the elevation must lie within certain narrow limits. For example, where a stream flowing into, and one flowing out of, a lake have both had their elevations recorded where they crossed a surveyed line, it is evident the elevation of the lake is known within certain limits. Many of the streams used for this purpose are not themselves recorded in the lists owing to their insignificant size.

The following is a summary of the present state of the reduction of the elevations of natural features along meridians and base lines to the datum of sea-level:—

Class.	Lines.	Miles.
I.	Lines referred to sea-level and published herewith.....	6,063
II.	Lines levelled, for which a known datum is available, but no lists are yet made.....	1,469
III.	Lines levelled, for which no known datum is available.....	235
	Total.....	7,767

The lines in class II have nearly all been levelled during the present season. The returns are either not yet checked or have not yet been received from the field. Most of the lines in class III are situated in very inaccessible localities, and some time must elapse before they can be connected to a known datum.

The distribution of these three classes according to locality is shown in the following table:—

Locality.	Reduced to Sea-Level datum.	Known datum, but not yet tabulated.	Datum not known.
	Miles.	Miles.	Miles.
Principal meridian and east and west .....	1,997	288	.....
Second meridian and west .....	387	202	.....
Third " " .....	863	178	.....
Fourth " " .....	1,300	395	.....
Fifth " " .....	1,163	289	18
Sixth " " .....	353	207	217
Totals.....	6,065	1,469	235

In regard to the bench-marks along meridians and base lines, none of these are included in the present report. The following table gives the number of bench-marks established and the state of their reduction to sea-level datum:—

#### BENCH-MARKS ALONG MERIDIANS AND BASE LINES.

Class.	Lines.	Miles.	Numbers of Bench-marks.
I.	Listed and referred to sea-level .....	5,442	6,827
II.	Established in the field, but not yet listed.....	1,732	2,200
III.	Listed, but on assumed datums.....	593	788
	Totals.....	7,767	9,815

As in the case of the previous summary of the reduction of the lines to sea-level, the bench-marks in class II are on lines most of which have been very recently levelled. The number of the bench-marks in this class is estimated.

It will be noted that the mileage stated for the three classes as tabulated for natural features and for bench-marks is not exactly the same in the tables. This is due to the available information in regard to datum being considered, in the case of a few lines, to be good enough as a basis for regarding the elevations of the natural features as being referred to sea-level, but not good enough for the purpose of bench-marks.

The elevations of the bench-marks are the real foundation of the whole system. These are recorded in the field to hundredths of a foot. No adjustments have yet been applied to their elevations. In compiling the lists for each line, when a surveyor has commenced his work off some previous line, the initial bench-mark heads the list and is given the same elevation as it has in the list of the previous line, which is always referred to sea-level if such a datum is

available. The same datum is used for all the bench-marks on the new line. When the line terminates by closing on a bench-mark of some other line as, for example, when a base line is run from one meridian to the next, the terminal bench-mark is listed at the end of the new line with the elevation carried through. A comparison of this with its elevation in the list of the line on which it was originally established serves at once to show the closing error.

This method of listing each line independently places the lists in a form readily available for future adjustment when sufficient circuits have been run in the field to clear the lines of all but small accidental errors, and it avoids the confusion which would inevitably follow a general adjustment made before sufficient work has been done in the field.

It is true that the temporary effect of such an arrangement is to have local discrepancies between the office elevation of a bench-mark and the elevation of some neighbouring natural feature as given in the lists in this report, but no confusion need occur on this account and the method adopted is the only one by which elevations of natural features can now be published while the elevations of the bench-marks, on which all future work depends, are kept free from useless temporary disturbance.

TABLE II.—Statement of mileage of levels along meridians and base lines run in each season.

NOTE:—Each season is taken as ending March 31 of following year.

Line.	Tps. or Rs.	Surveyor.	Miles.
<i>Season 1905.</i>			
18th base line west of 5th meridian.	1 - 19	J. N. Wallace.....	114
		Total.....	114
<i>Season 1908.</i>			
Third meridian.....	53 - 60	A. Saint Cyr.....	48
11th base line west of 5th meridian.	7 - 19	B. J. Saunders.....	68
		Total.....	116
<i>Season 1909.</i>			
15th base line west of 3rd meridian.	1 - 27	W. Christie.....	162
16th " " "	1 - 27	A. Saint Cyr.....	162
Fourth meridian.....	67 - 80	J. N. Wallace.....	84
9th base line west of 5th meridian	8 - 9	B. J. Saunders.....	12
10th " " "	8 - 11	B. J. Saunders.....	22
15th " " "	25 - 27	A. H. Hawkins.....	18
15th base line west of 6th meridian	1 - 8	A. H. Hawkins.....	48
16th " " "	1 - 4	A. H. Hawkins.....	24
17th " " "	1 - 9	G. MacMillan.....	52
18th " " "	9 - 14	G. MacMillan.....	29
		Total.....	613

TABLE II. Statement of mileage, etc.—Continued.

Line.	Tps. or Rs.	Surveyor.	Miles.
<i>Season 1910.</i>			
Principal meridian.....	29 - 35	E. W. Robinson.....	40
8th base line east of principal meridian.....	1 - 5	E. W. Robinson.....	27
9th base line east of principal meridian.....	1	E. W. Robinson.....	2
9th base line west of principal meridian.....	1 - 6	E. W. Robinson.....	22
15th base line west of principal meridian.....	21 - 31	E. W. Robinson.....	63
Second meridian.....	56 - 61	E. W. Robinson.....	32
Third meridian.....	61 - 64	A. Saint Cyr.....	24
17th base line west of 3rd meridian.	1 - 13	A. Saint Cyr.....	78
Fourth meridian.....	81 - 95	J. N. Wallace.....	87
18th base line west of 4th meridian.	1 - 12	W. Christie.....	72
19th " " "	1 - 5	B. J. Saunders.....	30
20th " " "	1 - 9	W. Christie.....	54
21st base line west of 5th meridian.	1 - 18	A. H. Hawkins.....	108
16th base line west of 6th meridian.	5 - 13	Geo. MacMillan.....	51
17th " " "	9 - 14	Geo. MacMillan.....	27
20th " " "	13 - 17	Geo. MacMillan.....	30
		Total.....	757
<i>Season 1911.</i>			
Principal meridian.....	48 - 60	A. W. Ponton.....	72
Second meridian.....	61 - 67	E. W. Robinson.....	33
15th base line west of 2nd meridian.	1 - 21	E. W. Robinson.....	126
17th " " 3rd "	14 - 27	A. Saint Cyr.....	81
Fourth meridian.....	61 - 66	A. Saint Cyr.....	36
Fourth meridian.....	95 - 105	J. B. MacFarlane.....	63
23rd base line west of 4th meridian.	1 - 26	G. H. Blanchet.....	150
24th " " "	1 - 4	J. B. MacFarlane.....	24
Fifth meridian.....	71 - 112	T. H. Plunkett.....	247
22nd base line west of 5th meridian.	1 - 20	A. H. Hawkins.....	120
28th " " "	1 - 4	T. H. Plunkett.....	22
29th " " "	1 - 2	T. H. Plunkett.....	6
21st base line west of 6th meridian.	13 - 26	G. MacMillan.....	79
22nd " " "	13 - 26	O. Rolfson.....	78
23rd " " "	9 - 13	J. R. Akins.....	30
North boundary of Peace River Block.....	13 - 25	J. R. Akins.....	75
East outline of range 13, W. 6th meridian.....	83 - 84	O. Rolfson.....	12
East outline of range 13, W. 6th meridian.....	85 - 88	J. R. Akins.....	24
West boundary of Peace River Block.....	77 - 80	G. MacMillan.....	24
West boundary of Peace River Block.....	85 - 88	J. R. Akins.....	24
		Total.....	1326



Cross lake end of Whisky Jack portage. Photo by O. Rolfsen, D.L.S.



Tracking canoe up small rapids, Nelson river. Photo by O. Rolfsen, D.L.S.

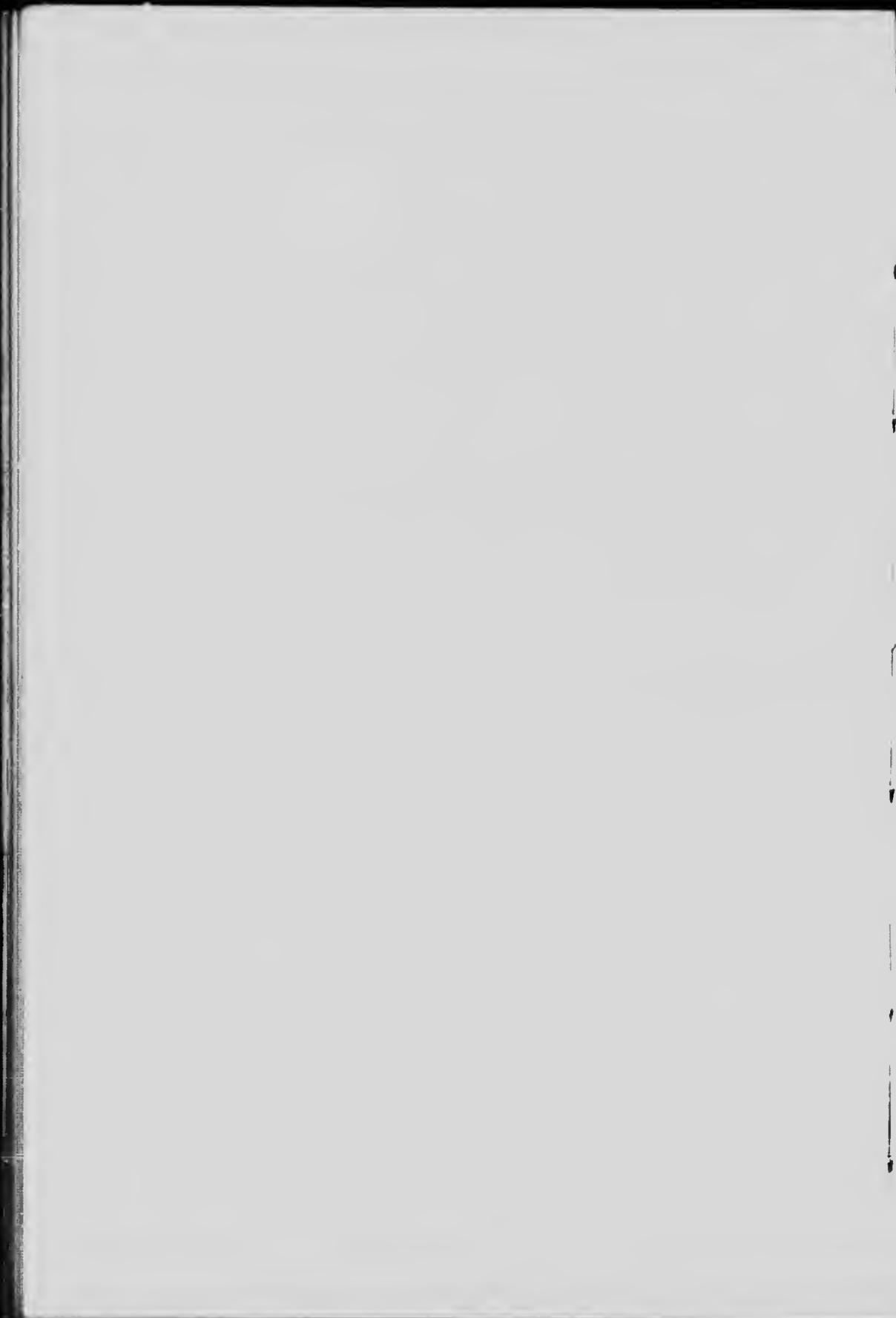


TABLE II.—Statement of milage, etc.—Continued.

Line.	Tps. or Rs.	Surveyor.	Miles.
<i>Season 1911.</i>			
Principal meridia . . . . .	1 - 28	A. G. Stuart . . . . .	168
“ . . . . .	61 - 72	G. H. Herriot . . . . .	68
10th base line west of principal meridian . . . . .	5 - 15	T. H. Plunkett . . . . .	57
11th base line west of principal meridian . . . . .	16 - 24	T. H. Plunkett . . . . .	54
12th base line west of principal meridian . . . . .	16 - 24	T. H. Plunkett . . . . .	40
13th base line west of principal meridian . . . . .	28 - 32	T. H. Plunkett . . . . .	25
14th base line west of principal meridian . . . . .	30 - 31	T. H. Plunkett . . . . .	11
15th base line west of principal meridian . . . . .	1 - 4	O. Rolfson . . . . .	19
16th base line west of principal meridian . . . . .	1 - 25	O. Rolfson . . . . .	150
17th base line west of principal meridian . . . . .	1 - 8	O. Rolfson . . . . .	48
13th base line west of 2nd meridian . . . . .	1 - 4	T. H. Plunkett . . . . .	24
Third meridian . . . . .	65 - 68	A. Saint Cyr . . . . .	24
18th base line west of 3rd meridian . . . . .	1 - 27	A. Saint Cyr . . . . .	158
Fourth meridian . . . . .	105 - 115	J. B. McFarlane . . . . .	56
19th base line west of 4th meridian . . . . .	6 - 26	G. H. Blanchet . . . . .	126
20th “ “ . . . . .	10 - 26	G. McMillan . . . . .	100
24th “ “ . . . . .	5 - 6	J. B. McFarlane . . . . .	9
23rd base line west of 5th meridian . . . . .	1 - 26	A. H. Hawkins . . . . .	150
Sixth meridian . . . . .	85 - 88	J. R. Akins . . . . .	24
Sixth meridian . . . . .	89 - 90	A. H. Hawkins . . . . .	12
20th base line west of 6th meridian . . . . .	18 - 26	J. R. Akins . . . . .	50
22nd “ “ . . . . .	5 - 7	J. R. Akins . . . . .	15
23rd “ “ . . . . .	1 - 9	J. R. Akins . . . . .	45
		Total . . . . .	1433
<i>Season 1913.</i>			
Principal meridian . . . . .	72 - 80	B. W. Waugh . . . . .	50
2nd base line west of principal meridian . . . . .	1 - 34	A. G. Stuart . . . . .	200
3rd base line east of principal meridian . . . . .	1 - 7	A. G. Stuart . . . . .	42
East outline of range 7, east principal meridian . . . . .	9 - 16	A. G. Stuart . . . . .	48
5th base line west of principal meridian . . . . .	31 - 33	A. G. Stuart . . . . .	17
6th base line west of principal meridian . . . . .	31 - 33	A. G. Stuart . . . . .	16
7th base line west of principal meridian . . . . .	31 - 33	A. G. Stuart . . . . .	15

TABLE II.—Statement of mileage, etc.—Continued.

Line.	Tps. or Rs.	Surveyor.	Miles.
<i>Season 1913—Con.</i>			
13th base line west of principal meridian.....	15 - 27	T. H. Plunkett.....	78
14th base line west of principal meridian.....	17 - 29	T. H. Plunkett.....	78
16th base line west of principal meridian.....	26 - 31	O. Rolfson.....	32
17th base line west of principal meridian.....	9 - 19	O. Rolfson.....	66
18th base line west of principal meridian.....	1 - 16	G. H. Herriot.....	96
19th base line west of principal meridian.....	1 - 7	G. H. Herriot.....	37
20th base line east of principal meridian.....	1 - 7	B. W. Waugh.....	42
20th base line west of principal meridian.....	1 - 3	B. W. Waugh.....	18
21st base line east of principal meridian.....	1 - 9	B. W. Waugh.....	54
East outline of range 31, W. principal meridian.....	1 - 24	A. G. Stuart.....	144
15th base line west of 2nd meridian	22 - 27	E. S. Martindale.....	36
16th " " "	12 - 27	E. S. Martindale.....	94
Third meridian.....	69 - 72	A. Saint Cyr.....	24
19th base line west of 3rd meridian	1 - 17	A. Saint Cyr.....	102
21st base line west of 4th meridian	1 - 26	F. V. Seibert.....	152
22nd " " "	1 - 26	G. H. Blanchet.....	152
24th " " "	6 - 11	J. B. McFarlane.....	33
25th " " "	1 - 12	J. B. McFarlane.....	72
24th base line west of 5th meridian.	18 - 21	J. R. Akins.....	24
25th " " "	18 - 21	J. R. Akins.....	24
26th " " "	18 - 20	J. R. Akins.....	18
27th " " "	9 - 18	J. R. Akins.....	57
27th " " "	19 - 22	J. A. Fletcher.....	21
28th " " "	18	J. A. Fletcher.....	6
East outline of range 18 W of 5th meridian.....	89 - 108	J. A. Fletcher.....	120
East outline of range 22 W of 5th meridian.....	89 - 92	J. R. Akins.....	24
		Total.....	1992
<i>Season 1914 (Part.)</i>			
(Work done up to October 31, 1914)			
Principal meridian.....	81 - 88	A. H. Hawkins.....	48
6th base line east of principal meridian.....	10	A. M. Narraway.....	6

TABLE II.—Statement of milage, etc.—*Concluded.*

Line.	Tps. or Rs.	Surveyor.	Miles.
<i>Season 1914 (Part.)—Con.</i>			
12th base line east of principal meridian.....	2 - 3	A. M. Narraway.....	12
13th base line east of principal meridian.....	1 - 2	A. M. Narraway.....	12
13th base line west of principal meridian.....	13 - 14	T. H. Plunkett.....	10
14th base line west of principal meridian.....	11 - 16	T. H. Plunkett.....	30
19th base line east of principal meridian.....	1 - 5	G. H. Herriot.....	30
21st base line east of principal meridian.....	12 - 19	G. H. Herriot.....	48
22nd base line east of principal meridian.....	1	A. H. Hawkins.....	6
22nd base line east of principal meridian.....	12 - 20	B. W. Waugh.....	54
22nd base line west of principal meridian.....	1	A. H. Hawkins.....	6
East outline of range 1 east.....	45 - 48	A. M. Narraway.....	24
East outline of range 3 east.....	37 - 44	A. M. Narraway.....	48
East outline of range 11 east.....	81 - 84	B. W. Waugh.....	24
East outline of range 20 east.....	85 - 87	B. W. Waugh.....	18
2nd base line west of 2nd meridian.....	1 - 30	A. G. Stuart.....	178
16th base line west of 2nd meridian.....	1 - 11	E. S. Martindale.....	66
2nd base line west of 3rd meridian.....	1 - 30	A. G. Stuart.....	178
24th base line west of 4th meridian.....	12 - 25	G. H. Blanchet.....	83
25th " " ".....	13 - 25	G. H. Blanchet.....	76
26th " " ".....	1 - 25	F. V. Seibert.....	146
26th base line west of 5th meridian.....	1 - 17	J. A. Fletcher.....	102
27th " " ".....	1 - 9	J. A. Fletcher.....	51
29th " " ".....	2 - 24	J. R. Akins.....	136
West boundary Peace River Block.....	81 - 84	L. Brenot.....	24
		Total.....	1416

SUMMARY OF MILEAGE.

Season 1905.....	114
1908.....	116
1909.....	613
1910.....	757
1911.....	1326
1912.....	1433
1913.....	1992
1914 (Part).....	1416
Total.....	7767

TABLE III.—Lines of levels along meridians and base-lines completed up to October 31, 1914.

Line.	Tps. or Rs.	Surveyor	Year.	Miles.
<b>Principal meridian</b>	1 - 28	A. G. Stuart	1912	168
" "	29 - 35	E. W. Robinson	1910	40
" "	48 - 60	A. W. Ponton	1911	72
" "	61 - 72	G. H. Herriot	1912	68
" "	72 - 80	B. W. Waugh	1913	50
" "	81 - 88	A. H. Hawkins	1914	48
2nd base west	1 - 34	A. G. Stuart	1913	200
3rd " east	1 - 7	"	1913	42
5th " west	31 - 33	"	1913	17
6th " east	10	A. M. Narraway	1914	6
6th " west	31 - 33	A. G. Stuart	1913	16
7th " "	31 - 33	"	1913	15
8th " east	1 - 5	E. W. Robinson	1910	27
9th " "	1	"	1910	2
9th " west	1 - 6	"	1910	32
10th " "	5 - 15	T. H. Plunkett	1912	57
11th " "	16 - 24	"	1912	54
12th " east	2 - 3	A. M. Narraway	1914	12
12th " west	16 - 24	T. H. Plunkett	1912	40
13th " east	1 - 2	A. M. Narraway	1914	12
13th " west	13 - 32	T. H. Plunkett	1912-14	113
14th " "	11 - 31	"	1912-14	119
15th " "	1 - 4	O. Rolfson	1912	19
15th " "	21 - 31	E. W. Robinson	1910	63
16th " "	1 - 31	O. Rolfson	1912-13	182
17th " "	1 - 19	"	1913	114
18th " "	1 - 16	G. H. Herriot	1913	96
19th " east	1 - 5	"	1914	30
19th " west	1 - 7	"	1913	37
20th " east	1 - 7	B. W. Waugh	1913	42
20th " west	1 - 3	"	1913	18
21st " east	1 - 9	"	1913	54
21st " "	12 - 18	G. H. Herriot	1914	48
22nd " "	1	A. H. Hawkins	1914	6
22nd " "	12 - 20	B. W. Waugh	1914	54
22nd " west	1	A. H. Hawkins	1914	6
East outline range 1E	45 - 48	A. M. Narraway	1914	24
East " 3E	37 - 44	"	1914	48
East " 7E	9 - 16	A. G. Stuart	1913	48
East " 11E	81 - 84	B. W. Waugh	1914	24
East " 20E	85 - 87	"	1914	18
East " 31W	1 - 24	A. G. Stuart	1913	144
<b>Second meridian</b>	56 - 67	E. W. Robinson	1910-11	65
2nd base west	1 - 30	A. G. Stuart	1914	178
13th " "	1 - 4	T. H. Plunkett	1912	24
15th " "	1 - 21	E. W. Robinson	1911	126
15th " "	22 - 27	E. S. Martindale	1913	36
16th " "	1 - 27	"	1913-14	160
Carried forward				2874

TABLE III—Continued.

Line.	Tps. or Rs.	Surveyor.	Year.	Miles.
Brought forward.....				2874
<b>Third meridian</b> .....	53 - 72	A. Saint Cyr.....	1909-13	120
2nd base west.....	1 - 30	A. G. Stuart.....	1914	178
15th ".....	1 - 27	W. Christie.....	1909	162
16th ".....	1 - 27	A. Saint Cyr.....	1910	162
17th ".....	1 - 27	".....	1910-11	159
18th ".....	1 - 27	".....	1912	158
19th ".....	1 - 17	".....	1913	102
<b>Fourth meridian</b> .....	61 - 66	A. Saint Cyr.....	1911	36
" ".....	67 - 95	J. N. Wallace.....	1909-10	171
" ".....	95 - 115	J. B. McFarlane.....	1911-12	119
18th base west.....	1 - 12	W. Christie.....	1910	72
19th ".....	1 - 5	B. J. Saunders.....	1910	30
19th ".....	6 - 26	G. H. Blanchet.....	1912	126
20th ".....	1 - 9	W. Christie.....	1910	54
20th ".....	10 - 26	G. McMillan.....	1912	100
21st ".....	1 - 26	F. V. Seibert.....	1913	152
22nd ".....	1 - 26	G. H. Blanchet.....	1913	152
23rd ".....	1 - 26	".....	1911	150
24th ".....	1 - 11	J. B. McFarlane.....	1911-13	66
24th ".....	12 - 25	G. H. Blanchet.....	1914	83
25th ".....	1 - 12	J. B. McFarlane.....	1913	72
25th ".....	13 - 25	G. H. Blanchet.....	1914	76
26th ".....	1 - 25	F. V. Seibert.....	1914	146
<b>Fifth meridian</b> .....	71 - 112	T. H. Plunkett.....	1911	247
9th base west.....	8 - 9	B. J. Saunders.....	1909	12
10th ".....	8 - 11	".....	1909	22
11th ".....	7 - 19	".....	1908	68
15th ".....	25 - 27	A. H. Hawkins.....	1909	18
18th ".....	1 - 19	J. N. Wallace.....	1905	114
21st ".....	1 - 18	A. H. Hawkins.....	1910	108
22nd ".....	1 - 20	".....	1911	120
23rd ".....	1 - 26	".....	1912	150
24th ".....	18 - 21	J. R. Akins.....	1913	24
25th ".....	18 - 21	".....	1913	24
26th ".....	1 - 17	J. A. Fletcher.....	1914	102
26th ".....	18 - 20	J. R. Akins.....	1913	18
27th ".....	1 - 9	J. A. Fletcher.....	1914	51
27th ".....	9 - 18	J. R. Akins.....	1913	57
27th ".....	19 - 22	J. A. Fletcher.....	1913	21
28th ".....	1 - 4	T. H. Plunkett.....	1911	22
28th ".....	18	J. A. Fletcher.....	1913	6
29th ".....	1	T. H. Plunkett.....	1911	6
29th ".....	2 - 24	J. R. Akins.....	1914	136
East Outline range 18.....	89 - 108	J. A. Fletcher.....	1913	120
" " 22.....	89 - 92	J. R. Akins.....	1913	24
Carried forward.....				6990

TABLE III—*Concluded.*

Line.	Tps. or Rs.	Surveyor.	Year.	Miles.
Brought forward.....				6990
<b>Sixth Meridian.....</b>	85 - 88	J. R. Akins.....	1912	24
“ “.....	89 - 90	A. H. Hawkins..	1912	12
15th base west.....	1 - 8	“.....	1909	48
16th “.....	1 - 4	“.....	1909	24
16th “.....	5 - 13	G. McMillan.....	1910	51
17th “.....	1 - 14	“.....	1909-10	79
18th “.....	9 - 14	“.....	1909	29
20th “.....	13 - 17	“.....	1910	30
20th “.....	18 - 26	J. R. Akins.....	1912	50
21st “.....	13 - 26	G. McMillan.....	1911	79
22nd “.....	5 - 7	J. R. Akins.....	1912	15
22nd “.....	13 - 26	O. Rolfson.....	1911	78
23rd “.....	i - 13	J. R. Akins.....	1911-12	75
North of Peace River Block	13 - 25	“.....	1911	75
East outline range 13.....	83 - 84	O. Rolfson.....	1911	12
“ “ 13.....	85 - 88	J. R. Akins.....	1911	24
West of Peace River Block..	77 - 80	G. McMillan.....	1911	24
“ “.....	81 - 84	L. Brenot.....	1914	24
“ “.....	85 - 88	J. R. Akins.....	1911	24
<b>Total.....</b>				<b>7,767</b>

## SUMMARY ACCORDING TO LOCALITY.

Principal meridian and east and west.....	2,285
Second meridian and west.....	589
Third “ “.....	1,041
Fourth “ “.....	1,605
Fifth.. “ “.....	1,470
Sixth “ “.....	777
<b>Total.....</b>	<b>7,767</b>

TABLE IV:—Sundry lines of levels completed up to October 31, 1914.

From.	To.	Route.	Year.	Miles.
Prince Albert.....	Third meridian, town- ship 52.....	Highway.....	1911	33
Lloydminster.....	16th base line R. 25, W. of 3rd meridian.....	Highway.....	1911	83
Athabaska.....	Fifth meridian, town- ship 71.....	River ice.....	1912	70
Bittern lake.....	Montreal lake.....	Highway.....	1913	5
Gretna.....	Principal meridian.....	Highway.....	1913	4
Mirror Landing... ..	Lesser Slave lake.....	River ice.....	1914	44
Mirror Landing... ..	18th base line, R. 2, W. of 5th meridian.....	River ice.....	1914	19
	<b>Total.....</b>			<b>258</b>

TABLE V:—Summary of mileage of all lines of levels completed up to October 31, 1914.

Class.	Miles.
Meridian and base-line levels.....	7,767
Precise levels (See table VI, page 45).....	1,664
Sundry lines of levels.....	258
Total.....	9,689

LINES OF PRECISE LEVELS.

Lines of precise levels were inaugurated during the season of 1912. The first line was levelled from Edmonton to Athabaska Landing and ran partly along the travelled highway and partly along the Canadian Northern railway track. The distance is 93 miles. This line has been referred to already.

In the same season, work was commenced on the fundamental line to extend from Winnipeg westerly to Edmonton along the Canadian Northern railway, to which reference has already been made. The distance between these places by way of the route selected, which is by Hudson Bay Junction and Prince Albert, is 958 miles. During the season, 429 miles were completed, extending from Hudson Bay Junction to Islay.

Nearly all the lines of precise levels have been run along railway tracks. The use of a railway handcar has been allowed by the railways, and one is used in all cases. The level party consists of the leveller, recorder, two rodmen, umbrella man, cook, a man appointed by the railway to watch the handcar, and one or two extra men to make bench-marks. These latter work independently in front of the level party.

A very material help in increasing speed is afforded by the use of a railway boarding car which is attached to one of the usual freight trains when camp is moved.

It is the almost universal practice on this continent to run lines of precise levels over railway tracks, using the rail itself as a turning point. In regard to the latter, careful investigation has failed to find any detriment to accuracy, while it very greatly increases the speed over that gained when other kinds of turning points are used. The method, however, seems to have failed in other countries. The Survey of India states: "The successful employment of a rail as a staff support must depend upon the construction of the permanent way. In India the permanent way is not sufficiently rigid."

The instruments hitherto used have been the precise level of the United States Coast and Geodetic Survey pattern, and precise rods graduated into yards, tenths, and hundredths of yards. The graduation of the rods is practically of the same pattern as is used on precise metre rods. The smallest graduation on the rod is one-hundredth of a yard, the readings being estimated to thousandths. Three wires are read as usual, the sum giving differences of elevation in feet. The readings of the three wires at each sight are read over again if the difference between the wire intervals exceeds three-thousandths of a yard.

All lines are run independently in both a forward and backward direction, different turning points being used. The limit set is 0.017 foot  $\sqrt$  miles, which corresponds to 4 millimetres  $\sqrt$  kilometres. Unless the duplicate measurements

of a mile section agree within this amount, the section is levelled over again.

The following is a specimen of the field book used. The readings which are marked off by heavy lines are intermediate sights, these being entered on the right-hand or left-hand page according as the point sighted on was in front of, or behind the instrument. This arrangement is necessary for subsequent computation of the mileage of the point from the stadia intervals. Such intermediate sights are taken after the main foresight and backsight readings have been recorded, the rodman walking back to the point, if necessary. They do not, therefore, in any way affect the accuracy of the main line. The intermediate sights which are recorded include the elevations of the rail at railway stations, important bridges, and road crossings. The water elevation is also taken for all streams crossed by the line.

SPECIMEN OF FIELD BOOK  
PRECISE LEVELS

*Left hand page.*

*Right hand page.*

SPIRIT LEVELLING.					SPIRIT LEVELLING.				
Date: 25 May, 1914.		Forward.			From B.M. 37 Wind M		To B.M. 38. Hour: 10-15 A.M.		
Sum: S									
No. of Station.	Thread Reading Back-sight.	Sum.	Thread Intervals.	Sum.	Rod and Temp.	Thread Reading Fore-sight.	Sum.	Thread Intervals.	Sum.
1 B	1632 1883 2134		251 251 502		68° A	1234 1482 1730		248 248 496	
2 A	1392 1638 1884		246 246 492	502 994	70° B	1220 1467 1716	4446 4403	247 249 496	496 992
2 A	1297 1528 1761		231 233 464		Base of rail, bridge No. 36.8 Water 16.4 ft. lower.				
3 B	1554 1799 2045		245 246 491	1485	72° A	1323 1571 1820		248 249 497	1489
4 A	1282 1528 1775		246 247 493	1978	74° B	1483 1730 1978	5191	247 248 495	1981
5 B	1123 1370 1617		247 247 494	2472	71 A	1559 1807 2054	5420	248 247 495	2479
5	Road crossing N. of Sec. 31 Tp. 35, R. 24.					1387 1485 1585	4457	98 100 198	
Forward.....		21656		2472			24174		2479

During the actual progress of the field work a record, which is a combination of computation and abstract, is filled in at intervals of every few days. A specimen is given below. The correction for temperature and also the partial and total discrepancies are stated in ten-thousandths of a foot. The abbreviations used in the columns headed "Sun" and "Wind" are as follows: S. = sunshine; C. = clouded; S.C. = sunshine and cloud; S. = strong wind; M. = moderate; L. = light; C. = calm. The direction of the sun and wind is shown by a small arrow (not entered in the specimen).

The standard temperature for the particular rods used is 60° F. The correction is therefore added arithmetically to the difference of elevation when the temperature is above standard, and subtracted when below. The sign of the partial discrepancy is always the same as the sign of the smaller of the duplicate measures. The "B.M.s" are the temporary bench-marks established at the end of each section. The actual width of the form on a single page is seven and a half inches. This combination has given better satisfaction with less chance of clerical error than a method of separating the record into two forms, in which much duplication is necessary.

It will be noted that, in the computation, the only correction considered is that for temperature. The instructions require that the lengths of the backsights and foresights be kept sufficiently balanced to dispense with any correction on their account. The difference of individual sights and the accumulated difference never exceeds twenty feet during the running of each section. Owing to the only available temporary bench-marks at the ends of mile sections being spikes driven into telegraph poles, and individual poles being sometimes unsuitable, the last station is an odd distance. The instrument is here first set up approximately, and the stadia only is read on the fore and back rods. From these readings the position of the instrument is adjusted so that the resulting accumulated distances of foresights and backsights shall be within a few feet of equality.

It is a question whether it is needful to consider any correction for temperature. Experience shows that the total correction for an average summer season is negligible. The important consideration is the absolute length of the rods, and whether this has undergone any sudden change during the progress of the work. It is too late to discover such changes by testing at the end of the season. The rods are much exposed to the sun. The rod thermometer has been at 103° F. and 90° is frequently exceeded.

Whatever the means adopted for determining the absolute length of the rods, it should be of a nature which can be used in the field under actual high and low temperatures. An ordinary steel band, whose own expansion is not certain, is not a very satisfactory guide.

In regard to the computation of the intermediate sights, these are entered in a separate abstract book, thus avoiding confusion in the main computation. Each line of this separate abstract book is complete in itself, the intermediate point being simply referred to the elevation of the commencement of the particular section as it has been computed in the main abstract.

In regard to bench-marks, the practice at present is to establish them on copper bolts placed in stone or concrete structures in the rare cases where such are available, and, where none exist, to build a special concrete pillar. This is placed in the outer edge of the railway right of way, fifty feet from the rails, and at least half a mile from any present indication of a railway station. While fifty feet may not be a great distance from the track, if the bench-mark is placed outside the right of way there is considerable chance of its being destroyed by some future farmer.

The pillar is made as follows: A hole about two feet diameter and six feet deep is first excavated. The tools used are a kind of crowbar to loosen the ground and a shovel, known as a spoon, attached to an eight-foot handle. A footing of concrete is placed at the bottom of the hole, and a hollow box made



of four planks, six feet long and one foot square at the base and eight inches square at the top, is placed vertically on the footing while it is soft. The box is then filled with concrete, the top coming about one foot above the surface. A round brass plate two and one-half inches diameter with a shank three and one-half inches long is sunk in the top of the concrete. The ground is at once filled in. The level party arrives about two weeks later. The part of the box above ground is detachable, and is removed. The remainder of the planks are left in the ground. The elevation of the top of the brass plate is recorded by the leveller.

In reference to the question of the permanence of bench-marks placed near a railway, the Survey of India considers that a really permanent bench-mark cannot be established anywhere near a railway, owing to the perpetual vibration:—

“If we examine the system under which thousands of bench-marks have come to be erected along railway lines, we find the railways afford the most direct, the most level and the most suitable routes for levelling work. But the most suitable route for levelling is not the most suitable line for bench-marks, and although the levelling operations will have to be mainly confined in the future to the lines of the great roads and railways, the system of erecting occasional permanent bench-marks on both flanks of the routes and at distances of two or three miles from the main lines will have to be introduced.”

It is further stated that fully one-third of the bench-marks established in India have not survived fifty years, although at the time of establishing them they were considered as “permanent points.” Whatever the difficulties in India, they are much greater in the partly settled districts of the Northwest, not only on account of the almost total absence of any kind of solid structures, and the difficulties of transporting materials to make artificial bench-marks, but because we do not know what will happen in the future at the exact spot where a bench-mark is placed. It may become part of a farm and be ploughed up, or become part of a village and be graded over for a road, or be excavated for some building. It is surprising how such things actually occur a few years after a bench-mark has been established in a place which appeared, at the time, perfectly safe from any possible future disturbance.

The line of precise levels along the Canadian Northern railway, which was commenced in 1912, was extended in the year 1913 westerly from Lloydminster to Edmonton, and easterly from Hudson Bay Junction to Swan River, Man., resulting in a continuous line 678 miles long. In the latter year a line was run from Calgary to Edmonton along the Canadian Pacific railway, a length of 199 miles, and an important line was levelled from Hudson Bay Junction northerly to Pas and the 15th base line, a distance of ninety-four miles. The total season's work amounted to 567 miles.

During the year 1914 the precise level line from Winnipeg to Edmonton over the Canadian Northern railway was completed, the part run during this season being from Winnipeg to Swan River by way of Portage la Prairie, Gladstone, and Dauphin. Spur connections were also run to lakes Manitoba, Dauphin, and Winnipegosis. The total length of this continuous line of levels between Winnipeg and Edmonton is 958 miles. Adding the line between Calgary and Edmonton to this, we have a total length of 1,157 miles of continuous levels.

The line along Hudson Bay railway has been extended to a point 96 miles northeasterly from Pas, and connection has been made to the sixteenth and seventeenth base lines where they cross this railway. This line will ultimately be continued to sea level at Nelson on Hudson bay as soon as the railway has been constructed that far.

In addition to these levels run along railway lines two other lines were levelled, during the year 1914, over the ice of Athabaska river and Lesser Slave river. One of these was run from Athabaska northerly for ninety-four miles.

It connected with the eighteenth, nineteenth and twentieth base lines where they cross Athabaska river, although levels have not yet been run on the part of the 18th base line near the river, this part having been surveyed before levels were inaugurated. The line down Athabaska river forms an important check on the base-line levels running between the fourth and fifth meridians as it cuts them all about midway between the meridians.

The other line was run westerly over the ice of Athabaska river from the fifth meridian to the mouth of Lesser Slave river and then up that river to Lesser Slave lake, a distance of forty-four miles, with a branch line nineteen miles long up Athabaska river to the crossing of the eighteenth base west of the fifth meridian.

The line from the town of Athabaska northerly down the river was run as much in accordance with precise methods as the circumstances would permit. The results are interesting as bearing on the feasibility of doing precise levelling over the ice of a frozen river in the depth of winter.

Athabaska river averages a quarter of a mile wide. It has long easy bends. The immediate banks of the river are about ten feet high, the ground then rising rapidly a little way back from the river to form a valley, about 400 feet deep, which is thickly timbered. This would appear to afford shelter from wind, but such was not the case, the wind generally sweeping down the length of the river. Camp was moved by horses and sleighs over the ice, and a team of horses and a sleigh were used during the actual work much as a handcar is used to move from station to station when running precise levels along a railway. The work was carried out by Mr. L. O. R. Dozois, D.L.S., who has had considerable experience in running precise levels.

The primary object of the line of levels was to connect with the levels of the 19th and 20th base lines where these lines crossed Athabaska river. The work was commenced on January 6, 1914. As the period of safe ice was short, no exact limit was placed on the allowable discrepancy between the forward and backward lines, the intention being to run as precise a line as circumstances would permit. The work was completed on March 6, just before the ice became unsafe, ninety-four miles of double line having been run in sixty days. In the result, seventy-one per cent of the mile sections had a discrepancy less than 0.017 foot, which is the summer limit; eighteen per cent were over this but under 0.030 foot, and the remaining 11 per cent, all near the end of the work where time was very pressing, were between 0.030 and 0.040 foot. The total accumulated discrepancy in the whole ninety-four miles is 0.053 foot. The probable error of the mean result for a mile section is 0.0055 foot, which is considerably greater than is the case in summer work on a railway track.

The greatest hindrance to accurate work on ice is the unsteadiness of the air whenever the sun is shining. So long as the sky is clouded there is little difficulty in keeping the discrepancy below 0.017 foot, although the work is naturally a good deal slower than precise level work along a railway track, and the conditions are severe on all members of the level party. When the sun is shining, however, it becomes almost impossible to work.

There is no serious source of error in using turning plates on either ice or well packed snow, provided the temperature is well below freezing, and care is exercised, nor is the instrument much affected unless the cold becomes very extreme when it becomes very stiff. The sensitiveness of the bubble does not appear to be affected to any extent. The mean temperature of the rods during February was  $+1^{\circ}$  F. The mean for the whole line was  $+11^{\circ}$  F. Mile sections were frequently levelled with a discrepancy of less than 0.017 foot at a temperature below  $-20^{\circ}$  F.

The general conclusion was that the summer limit of 0.017 foot, when applied to work in winter, requires too much re-running to allow for economical work under the severe surroundings. With a limit of 0.030, however, an average of fifty miles of double line can be completed per month, provided

matters of transport do not cause delay. When no other route is available (and such is frequently the case in the Northwest) much useful work can be done over ice with a higher degree of accuracy than is practicable on base-line levels, thus affording a valuable control on such levels.

The lines of precise levels run up to October 31, 1914, are shown in the following table:—

TABLE VI. —Lines of precise levels completed to October 31, 1914.

Line	From	To	Year	Surveyor	Miles
D	Edmonton	Athabaska	1912	C. de la Condamine	93
E	Prince Albert	Warman	"	L. O. R. Dozois	74
F	Warman	Lloydminster	"	" "	168
G	Prince Albert	H. B. Junction	"	C. de la Condamine	162
H	Calgary	Edmonton	1913	L. O. R. Dozois	199
J	H. B. Junction	Pas	"	C. de la Condamine	94
K	H. B. Junction	Swan River	"	" "	102
L	Edmonton	Lloydminster	"	L. O. R. Dozois	172
M	Athabaska	20th base line	1914	" "	91
P	Prince Albert	Big River	"	J. T. Carthew	85
Q	Winnipeg	Swan River	"	L. O. R. Dozois	325
J	Pas	H. B. Railway	"	E. W. Berry	96
Total.....					1,564

Table VII gives a summary of the accumulated discrepancy between the duplicate lines of levelling for nearly all the lines of precise levels, this being stated as it occurred at the end of every five miles. The table also gives the probable error of the mean result per mile of double levelling, and for the whole of each line.

The latter two quantities have been computed as follows:—

- Let  $e$  = probable error of the mean result per mile.
- $E$  = probable error of the mean result for the whole line.
- $d$  = discrepancy between the forward and backward measures of a section of levelling.
- $l$  = the number expressing the length of the particular section, expressed in miles.
- $n$  = number of sections in the whole line.
- $M$  = number of miles in the whole line.

Then:—

$$e = 0.4769 \sqrt{\frac{\sum d^2}{2n}} \qquad E = 0.4769 \sqrt{M \frac{\sum d^2}{2n}}$$

If the sections are all one mile long  $l = 1$ , and  $n = M$ , and the formula would become:—

$$e = 0.6745 \sqrt{\frac{\sum d^2}{4M}} \qquad \text{and} \qquad E = 0.6745 \sqrt{\frac{\sum d^2}{4}}$$

The sections, however, in the lines run, while approximating one mile each, are not equal in length and consequently the quantities  $\frac{d^2}{l}$  have had to be computed separately for each section.

No circuits involving only lines of precise levels have yet been levelled in the field.

TABLE VII.—Summary of accumulated discrepancy between forward and backward levellings, and probable error of the mean result.

Line.	D	E	F	G	H	J
Total Length.	93 miles	74 miles.	168 miles.	162 miles.	199 miles.	94 miles.
Route.	Highway and Railway.	Railway.	Railway.	Railway.	Railway.	Railway.
Miles.	Foot.	Foot.	Foot.	Foot.	Foot.	Foot.
0	0.000	0.000	0.000	0.000	0.000	0.000
5	+ 0.071	- 0.002	+ .0.023	+ 0.020	+ 0.005	- 0.006
10	+ 0.033	- 0.011	- 0.043	+ 0.065	- 0.008	- 0.015
15	+ 0.020	- 0.005	- 0.054	+ 0.029	- 0.024	+ 0.005
20	- 0.022	+ 0.011	- 0.096	+ 0.018	- 0.051	- 0.001
25	+ 0.018	+ 0.041	- 0.155	+ 0.064	- 0.044	- 0.030
30	- 0.007	+ 0.044	- 0.160	+ 0.065	- 0.022	- 0.036
35	- 0.045	+ 0.036	- 0.115	+ 0.098	- 0.051	- 0.011
40	- 0.056	+ 0.070	- 0.098	+ 0.088	- 0.080	- 0.013
45	- 0.086	+ 0.100	- 0.080	+ 0.125	- 0.076	- 0.045
50	- 0.073	+ 0.067	- 0.117	+ 0.132	- 0.090	- 0.054
55	- 0.098	+ 0.018	- 0.103	+ 0.159	- 0.067	- 0.048
60	- 0.144	- 0.010	- 0.157	+ 0.129	- 0.064	- 0.020
65	- 0.112	- 0.062	- 0.203	+ 0.152	- 0.068	- 0.043
70	- 0.134	- 0.090	- 0.228	+ 0.152	- 0.030	0.000
75	- 0.147	- 0.119	- 0.221	+ 0.175	- 0.001	+ 0.019
80	- 0.131		- 0.233	+ 0.161	- 0.029	+ 0.053
85	- 0.088		- 0.229	+ 0.162	- 0.021	+ 0.061
90	- 0.068		- 0.242	+ 0.181	- 0.055	+ 0.027
95	- 0.104		- 0.260	+ 0.189	- 0.053	- 0.004
100			- 0.262	+ 0.208	- 0.046	
105			- 0.279	+ 0.170	- 0.040	
110			- 0.250	+ 0.164	- 0.076	
115			- 0.327	+ 0.153	- 0.056	
120			- 0.323	+ 0.146	- 0.063	
125			- 0.371	+ 0.156	- 0.062	
130			- 0.384	+ 0.157	- 0.060	
135			- 0.457	+ 0.157	- 0.020	
140			- 0.504	+ 0.152	- 0.036	
145			- 0.535	+ 0.161	- 0.032	
150			- 0.578	+ 0.144	- 0.040	
155			- 0.588	+ 0.117	- 0.054	
160			- 0.599	+ 0.106	- 0.063	
165			- 0.633		- 0.083	
170			- 0.644		- 0.080	
175					- 0.051	
180					- 0.073	
185					- 0.062	
190					- 0.068	
195					- 0.043	
200					- 0.047	

TABLE VII—Summary of accumulated discrepancy between forward and backward levellings, and probable error of the mean result.—Continued.

Line.	K	L	M	P	Q
Total Length.	102 miles.	172 miles.	94 miles.	85 miles.	125 miles.
Route.	Railway.	Railway.	Ice.	Railway.	Railway.
Miles.	Foot.	Foot.	Foot.	Foot.	Foot.
0	0.000	0.000	0.000	0.000	0.000
5	- 0.014	+ 0.011	+ 0.007	+ 0.028	- 0.012
10	+ 0.006	+ 0.005	+ 0.042	+ 0.008	+ 0.002
15	+ 0.004	+ 0.007	+ 0.054	+ 0.039	- 0.002
20	- 0.009	- 0.010	+ 0.045	+ 0.075	+ 0.011
25	- 0.015	0.000	+ 0.054	+ 0.061	+ 0.007
30	- 0.007	- 0.008	+ 0.051	+ 0.078	- 0.015
35	+ 0.026	- 0.001	+ 0.100	+ 0.087	- 0.028
40	+ 0.013	- 0.013	+ 0.051	+ 0.075	- 0.030
45	+ 0.027	- 0.037	+ 0.082	+ 0.060	- 0.029
50	+ 0.036	- 0.067	+ 0.070	+ 0.085	- 0.048
55	- 0.007	- 0.044	+ 0.082	+ 0.082	- 0.012
60	- 0.012	- 0.043	+ 0.122	+ 0.037	- 0.054
65	- 0.035	- 0.026	+ 0.141	- 0.025	- 0.069
70	- 0.052	- 0.066	+ 0.105	- 0.017	- 0.056
75	- 0.081	- 0.070	+ 0.102	+ 0.015	- 0.063
80	- 0.097	- 0.081	+ 0.066	- 0.001	- 0.065
85	- 0.127	- 0.067	+ 0.111	- 0.027	- 0.043
90	- 0.167	- 0.043	+ 0.036		- 0.018
95	- 0.161	- 0.054	+ 0.053		- 0.029
100	- 0.186	- 0.079			- 0.005
105		- 0.101			+ 0.002
110		- 0.084			- 0.008
115		- 0.075			0.000
120		- 0.081			+ 0.008
125		- 0.066			+ 0.012
130		- 0.060			
135		- 0.084			
140		- 0.072			
145		- 0.073			
150		- 0.074			
155		- 0.080			
160		- 0.070			
165		- 0.074			
170		- 0.052			
175		- 0.067			
180					
185					
190					
195					
200					

## PROBABLE ERROR OF THE MEAN RESULT.

Line.	D	E	F	G	H	J
Per mile	0·0041	0·0037	0·0039	0·0032	0·0032	0·0030
Whole line	0·0384	0·0320	0·0512	0·0400	0·0440	0·0292

## PROBABLE ERROR OF THE MEAN RESULT.

Line.	K	L	M	P	Q
Per mile	0·0030	0·0030	0·0055	0·0033	0·0033
Whole line	0·0303	0·0394	0·0537	0·0309	0·0373

The table includes all the lines of precise levels excepting those parts of lines J and Q which have been levelled in the latter part of the present season of 1914. The missing letters have been used for lines which were run as ordinary levels. The average of the probable errors of the mean result for a mile, excluding line M which was levelled on the ice, is 0·0034 foot, with extremes of 0·0041. and 0·0030. For purposes of comparison the following table, derived from the levels of the Survey of India, is inserted here: It has been obtained by selecting the ten most recently levelled lines from the full list of lines in the report of that survey.

TABLE VIII:—Survey of India. Probable error of the mean result per mile of levelling.....

Line No.	Miles.	Probable error of the mean result per mile.
8.....	44.....	0·0024
14.....	215.....	0·0021
16.....	137.....	0·0033
17.....	102.....	0·0038
21.....	96.....	0·0032
22.....	89.....	0·0041
25.....	30.....	0·0032
26.....	170.....	0·0033
31.....	52.....	0·0033
32.....	34.....	0·0015
Average .....		0·0030



Photo by O. Roussos, D.L.S.

Pipestone rapids on Nelson river.



The probable accidental error per mile for the whole of India is stated to be  $\pm 0.0040$  foot, and the probable systematic error per mile to be  $0.00034$  foot. The following formula is given as representing the probable error of the height of any bench-mark at a distance of  $M$  miles from the nearest tidal station:—

$$\sqrt{(0.004)^2 M + (0.00034)^2 M^2}$$

The United States Coast and Geodetic Survey state the corresponding constants for their lines of precise levels to be  $0.0029$  foot and  $0.0001$  foot. It must be understood that the Indian formula gives an average for the whole of India, including lines run many years ago. If only recent lines were considered the constants would be smaller.

The Ordnance Survey of Great Britain have run many miles with a probable error varying from  $0.0015$  to  $0.0032$  foot, mean  $0.0023$ . Field conditions with them are, however, generally favourable. Wind is a serious impediment in most localities in northwestern Canada, and the need of having to run long distances here in a season owing to the amount of work to be done and the inevitable indirect effect of difficulties of transport should not be lost sight of in making comparisons.

All the elevations along lines of precise levels are referred to sea-level. The basis of this is at present a bench-mark established at Warman, in Saskatchewan, which has been connected to the precise level system of the United States Coast and Geodetic Survey at Stephen, a place in the state of Minnesota about forty miles south of Emmerson in the extreme south of the province of Manitoba. The elevation of the Warman bench-mark is considered as being  $1679.880$  feet above mean sea-level.

The total mileage of the lines along which elevations are given in Part II of this report is as follows:—

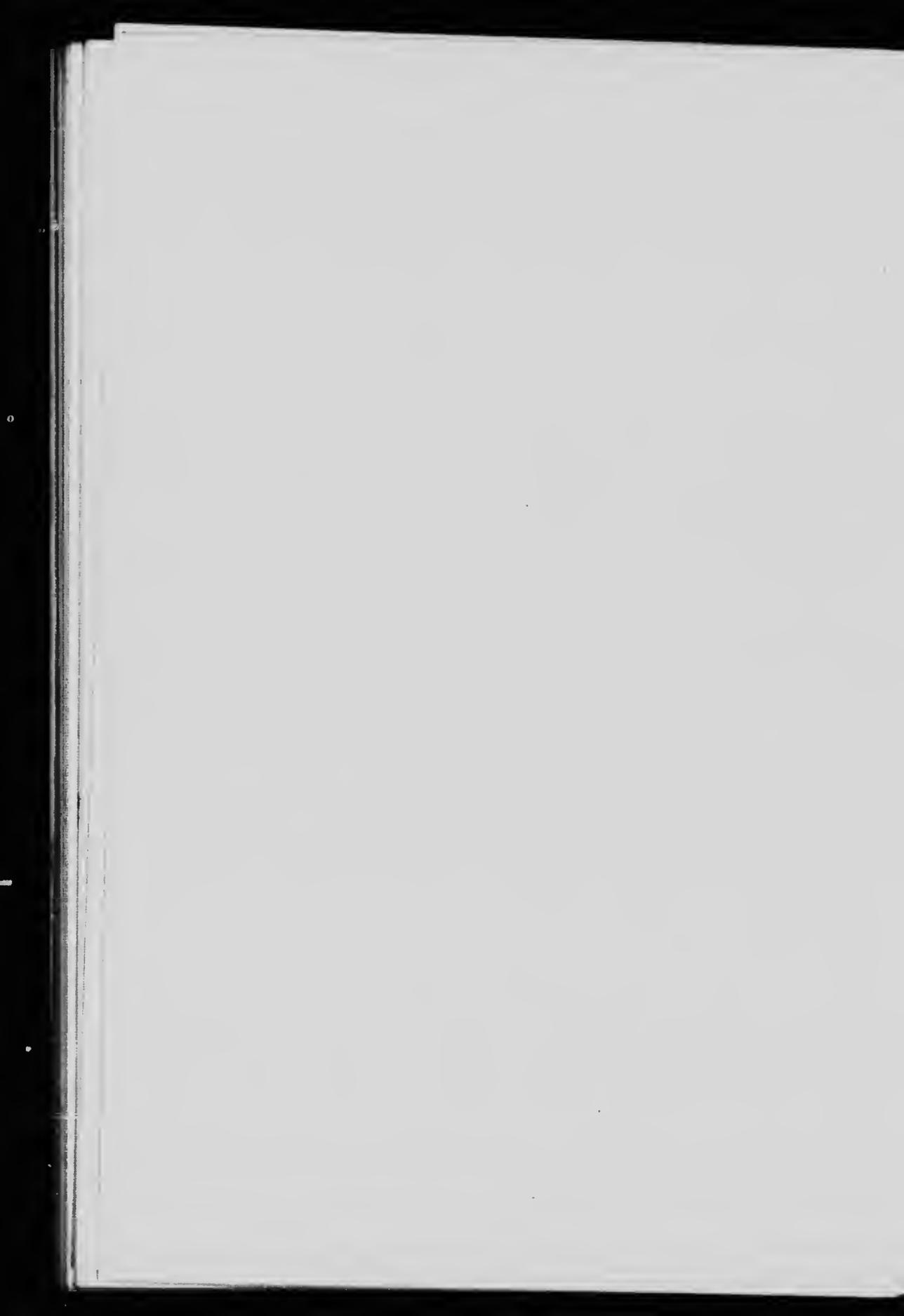
	Miles.
Meridian and base-line levels.....	6,063
Precise levels.....	1,158
Sundry lines of levels.....	138
Total.....	7,359

Elevations along Athabaska river, excepting those north of the 20th base line, and all the elevations along Lesser Slave river are derived from special lines of levels run along their course.

Elevations along Athabaska river north of the 20th base, and all those along Peace river are derived from assembling results recorded along the several base lines which cross these two rivers.

The mileage along the rivers in the latter case is not considered in the total mileage given above.

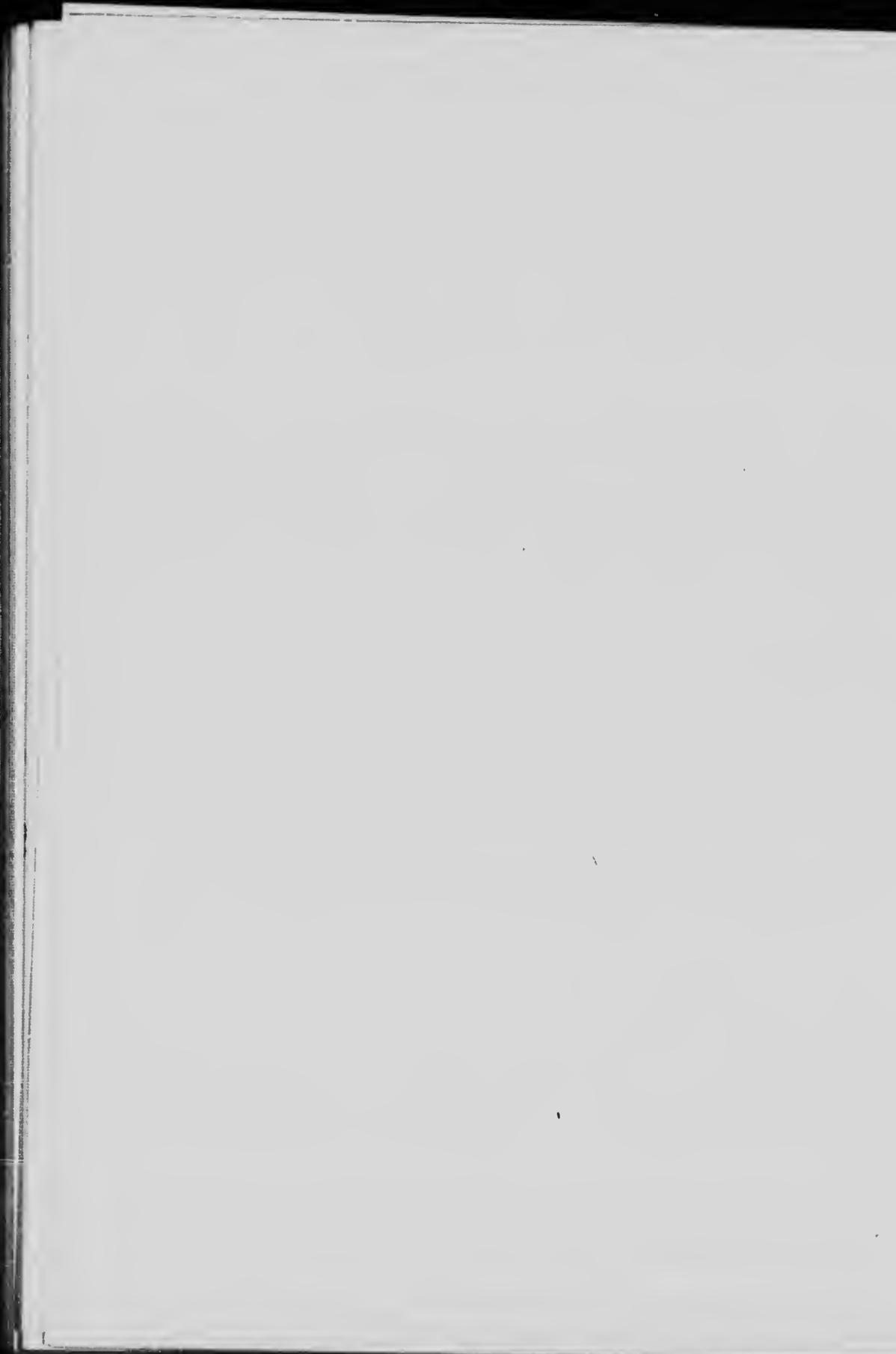
There are approximately 8,900 elevations recorded in part II.



## **PART II.**

### **SUMMARY OF RESULTS OF LEVELLING.**

- SECTION 1.** Elevations of Natural Features along Meridians and Base lines.
- SECTION 2.** Elevations of Bench-marks and sundry other Points along lines of precise levels.
- SECTION 3.** Elevations of rivers.



LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

PRINCIPAL MERIDIAN.

M. P. 23

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	1		0.00	804	Ground at international boundary. Gretna station, Canadian Pacific Ry., 4 miles west of line. West Gretna station, Great Northern Ry., 4½ miles west of line. Ground at northeast corner. " " Summit. " " " "
				831	
				830	
		12	80.00	795	
		24	80.00	797	
1	12			805	" " " "
				802	
		12	80.00	797	
		24	80.00	792	
		36	80.00	794	
2	36		80.75	785	Water level in drainage ditch. " " " " " " " " " " " " " " " "
				789	
				786	
				785	
				789	
3	24		0.50	787	Ground at northeast corner. Water level in drainage ditch. " " " " Ground at northeast corner. Water level in drainage ditch. " " " " Ground at northeast corner. Water level in drainage ditch.
				783	
				787	
				787	
				787	
4	36		1.30	783	Ground at northeast corner. " " " " " " " " " " " " Canadian Pacific Ry., Pembina branch. Ground at northeast corner. Water level in north ditch. Ground at northeast corner. Water level in drainage ditch. Canadian Northern railway, Morris- Brandon branch. Ground at northeast corner. Water level in drainage ditch. " " " " Ground at northeast corner. Water level in drainage ditch. Ground at northeast corner. " " " "
				785	
				789	
				781	
				781	
				780	
				778	
				784	
5	36		80.00	781	Ground at northeast corner. Water level in drainage ditch. Canadian Northern railway, Morris- Brandon branch. Ground at northeast corner. Water level in drainage ditch. Ground at northeast corner. " " " "
				780	
				778	
				781	
				781	
6	12		0.36	778	Ground at northeast corner. Water level in drainage ditch. Ground at northeast corner. " " " " " " " " " " " "
				781	
				778	
				778	
				781	
				781	
7	1		60.00	781	Morris river. Ground at northeast corner. Ground at northeast corner. Morris river. Ground at northeast corner. " " " " " " " " " " " "
				766	
				780	
				781	
				763	
				780	
8	13		80.00	782	Ground at northeast corner. " " " " " " " " " " " " " " " "
				782	
				782	
				782	
				782	
9	24		80.00	782	" " " " " " " "
				782	
10	36		80.00	782	" " " " " " " "
				782	

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## PRINCIPAL MERIDIAN.

MAPS 23, 73

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
7	24	80.00		782	Ground at northeast corner.
	36	60.00		780	"
8	12	80.00		780	" at northeast corner.
	24	45.45		784	Canadian Northern Ry., Carman-Winnipeg branch.
	24	80.00		777	Ground at northeast corner.
	36	7.93		763	Rivière Sale.
	36	80.00		780	Ground at northeast corner.
9	12	80.00		781	" "
	24	80.00		784	" "
	36	80.00		78:	" "
10	12	42.23		785	Canadian Pacific Ry., Souris branch.
	12	80.00		781	Ground at northeast corner.
	13	51.54		785	Canadian Northern railway, main line.
	24	54.66		785	Grand Trunk Pacific railway, main line.
	24	80.00		780	Ground at northeast corner.
	25	18.95		766	Assiniboine river.
	25	54.00		766	" "
	36	80.00		785	Ground at northeast corner.
11	12	20.46		783	Ground.
	13	40.00		787	Ground at $\frac{1}{4}$ post.
	24	80.00		787	" northeast corner.
	25	0.00		783	Water level in ditch.
	36	80.00		792	Ground at northeast corner.
12	12	18.83		798	Canadian Pacific railway, main line.
	12	80.00		799	Ground at northeast corner.
	13	80.00		808	" "
	24	80.00		804	" "
	36	80.00		807	" "
13	1	65.14		817	Canadian Northern railway, Oak Point-Winnipeg branch.
	12	80.00		818	Ground at northeast corner.
	24	4.00		819	"
	24	80.00		813	Ground at northeast corner.
	36	40.00		820	" $\frac{1}{4}$ post.
	36	80.00		813	" northeast corner.
14	1	80.00		828	" "
	12	80.00		821	" "
	24	80.00		836	" "
	36	80.00		872	" "
15	12	80.00		890	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

PRINCIPAL MERIDIAN.

MAPS 73, 123

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
15	24	80.00		891	Ground at northeast corner.
	36	80.00		888	" "
16	12	60.00		896	"
	24	80.00		896	Ground at northeast corner.
	36	6.00		895	Lake.
	36	60.00		900	Ground
17	12	80.00		901	" at northeast corner.
	24	80.00		897	" "
	36	80.00		898	" "
18	12	40.00		903	" $\frac{1}{4}$ post.
	24	80.00		913	" northeast corner.
	36	80.00		913	" "
19	12	80.00		895	" "
	13	64.00		883	Ground.
	24	80.00		894	" at northeast corner.
	36	80.00		916	" "
20	24	17.60		920	" "
	36	80.00		860	" "
21	12	80.00		865	" "
	24	80.00		871	" "
	36	80.00		865	" "
22	12	80.00		857	" "
	24	80.00		865	" "
	36	80.00		854	" "
23	12	73.00		837	Icelandic river. August.
	12	80.00		846	Ground at northeast corner.
	24	80.00		847	" "
	36	80.00		856	" "
24	12	80.00		849	" "
	13	80.00		819	" "
	24	80.00		803	" "
	36	80.00		799	" "
25	12	58.00		780	Creek.
	12	80.00		793	Ground at northeast corner.
	24	80.00		775	" "
	25	69.00		772	Creek.
	36	80.00		791	Ground at northeast corner.
26	12	31.50		803	Lake.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

MAP 173

## PRINCIPAL MERIDIAN.

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
26	12	80.00		811	Ground at northeast corner.
	13	80.00		811	" "
	24	80.00		811	" "
	36	80.00		801	" "
27	13	40.00		740	" $\frac{1}{4}$ post.
	24	80.00		747	" northeast corner.
	36	80.00		740	" "
28	12	80.00		745	" "
	24	42.00		723	east river.
	36	80.00		740	Ground at northeast corner.
29	1	80.00		745	" "
	13	71.90		779	" "
	24	80.00		766	" at northeast corner.
	36	80.00		752	" "
30	1	80.00		743	" "
	12	80.00		741	" "
	24	80.00		734	" "
	36	80.00		736	" "
31	12			720	Lake St. George, south side.
	36			720	" " north "
	36	80.00		730	Ground at northeast corner.
32	1	40.00		738	" $\frac{1}{4}$ post.
	12	80.00		730	Lake at northeast corner.
	13	26.00		737	Ground.
	24	24.00		725	Lake.
	24	80.00		728	Ground at northeast corner.
	25			723	Lake St. Patrick, south side.
33				723	" " north side.
	13			727	Creek.
	24	70.00		738	Ground.
	36	80.00		741	" at northeast corner
34	1	80.00		755	" "
	12	80.00		747	" "
	25	21.00		759	" "
	25	28.00		757	Lake St. Michael.
	36	80.00		761	Ground at northeast corner.
35	12	80.00		749	" "
	13	80.00		742	" "
	24			716	Lake Winnipeg, water on south shore.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

PRINCIPAL MERIDIAN.

MAP (323)

Tp.	Sec.	Distance	Elev.	Feature.
		from SE. Corner.		
48	36	Chs. Lks. 51.00	Feet. 716	Lake Winnipeg, water on north shore.
	36	69.00	719	Ground at witness mound.
49	12	40.00	724	" 1/4 post.
	12	80.00	721	" northeast corner.
	13	40.00	722	" 1/4 post.
	24	80.00	723	" northeast corner.
	25	18.00	740	"
	25	77.00	735	" at witness mound.
50	36	31.50	741	"
	1	15.00	734	" at witness mound.
	1	77.00	737	" "
	12	50.00	747	"
	13	40.50	751	Ground.
	13	80.00	742	" at northeast corner.
	24	46.00	749	"
	24	80.00	737	" at northeast corner.
	25	7.00	741	"
	36	80.00	732	" at north east corner.
51	12	77.00	731	" witness mound.
	13	78.10	713	Belanger river. July.
	24	2.00	725	Ground at witness mound.
	24	40.35	721	Creek.
	24	80.00	736	Ground at northeast corner.
	36	80.00	739	" "
52	1	27.60	744	"
	13	1.00	748	Ground at witness mound.
	13	70.50	753	"
	24	80.00	754	" at northeast corner.
	25	80.00	763	" "
	36	25.10	781	"
	36	80.00	761	" at northeast corner.
53	1	80.00	753	" "
	13	3.00	749	" witness mound.
	13	80.00	745	" northeast corner.
	24	76.00	745	" witness mound.
	25	80.00	743	" northeast corner.
	36		732	Gunisao river. August.
54	1	30.65	759	Ground.
	1	80.00	749	" at northeast corner.
	12	80.00	751	" "
	13	70.00	751	" witness mound.
	25	25.00	764	"
	25	31.30	741	Creek.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## PRINCIPAL MERIDIAN.

MAPS (323), (373)

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.	
		Chs.	Lks.			
54	25	77.00		753	Ground at witness mound.	
	36	13.50		750	Lake.	
	36	47.00		764	Ground.	
55	1	80.00		752	Ground at northeast corner.	
	13	0.00		755	" witness mound.	
	13	80.00		754	" northeast corner.	
	24	72.15		752	Lake, south side.	
	25	40.00		765	Ground at $\frac{1}{4}$ post.	
	36	16.83		741	McLaughlin river.	
	36	37.20		752	Ground.	
56	36	80.00		742	" at northeast corner.	
	1	22.55		737	McLaughlin river.	
	1	47.95		762	Ground.	
	1	80.00		754	" at northeast corner.	
	12	70.00		767	"	
	13	68.00		779	"	
	24	3.00		759	" at witness mound.	
	25	1.00		756	" "	
	25	40.00		772	" $\frac{1}{4}$ post.	
	25	80.00		760	" northeast corner.	
	36	27.90		783	"	
	36	67.18		760	Lake, south side.	
	57	1	1.00		761	Ground at witness mound.
		1	12.25		780	"
		1	80.00		760	" at northeast corner.
		12	6.01		757	Lake.
12		40.00		769	Ground at $\frac{1}{4}$ post.	
12		51.11		760	Lake.	
12		80.00		769	Ground at northeast corner.	
13		60.86		759	Lake. September.	
13		80.00		774	Ground at northeast corner.	
24		41.67		749	Creek.	
24		64.00		774	Ground.	
24		80.00		759	" at northeast corner.	
25		52.95		763	Creek.	
25		80.00		764	Ground at northeast corner.	
36		80.00		770	" "	
58		12	80.00		761	Ground at northeast corner.
	13	9.98		778	Ground.	
	13	66.51		745	Lake, south side.	
	24	23.90		775	Ground.	
	25	0.00		763	" at witness mound.	
	25	80.00		764	" northeast corner.	
	36	80.00		758	" "	

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

PRINCIPAL MERIDIAN.

MAP (373)

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
59	1	80.00		759	Ground at northeast corner.
	12	80.00		752	" "
	25	2.00		755	witness mound.
	25	60.05		736	"
	36	71.00		745	" at witness mound.
60	1	36.00		728	Water in swamp.
	1	80.00		737	Ground at northeast corner.
	12	23.00		726	Water in swamp.
	13	77.00		732	Ground at witness mound.
	24	80.00		790	" northeast corner.
	25	80.00		795	" "
	36	80.00		782	" "
61	1	80.00		774	" "
	12	80.00		759	" "
	24	72.00		730	" witness mound.
	25	55.34		707	East channel, expansion. June.
	25	80.00		719	Ground at northeast corner.
	36	69.35		707	East channel, expansion.
	36	80.00		712	Ground at northeast corner.
62	1	80.00		744	" "
	12	20.00		730	"
	12	61.75		705	Nelson river, east fork of east branch.
	12	77.00		720	Ground at witness mound.
	13	80.00		724	" northeast corner.
	24	79.42		705	East channel (branch).
	25	80.00		729	Ground at northeast corner.
	36	20.00		702	Nelson river, east fork of east branch.
	36	64.28		745	Ground.
	36	80.00		726	Ground at northeast corner.
	63	1	31.98		745
1		80.00		718	" at northeast corner.
12		80.00		734	" "
13		80.00		719	" "
24		45.24		739	Ground.
24		80.00		700	" at northeast corner.
25		49.54		757	"
25		80.00		721	" at northeast corner.
36	46.50		687	Pickereel lake, south side. July.	
64	1	20.00		725	Ground at witness mound.
	1	80.00		693	Ground at northeast corner.
	12	46.30		691	Creek.
	12	80.00		746	Ground at northeast corner.
	13	8.85		729	"
	13	80.00		755	" at northeast corner.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## PRINCIPAL MERIDIAN.

MAP 423

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
64	24	80.00		747	Ground at northeast corner.
	25	63.08		724	Creek.
	25	78.00		742	Ground at witness mound.
	25	80.00		732	Water in swamp.
	36	23.10		723	Target lake.
	36	29.85		740	Island
	36	80.00		737	Ground at northeast corner.
65	1	13.25		717	Creek, flowing northeast to Cross lake.
	1	17.25		738	Ground.
	1	80.00		733	" at northeast corner.
	12	14.42		711	Creek (same as above).
	12	53.56		733	Ground.
	12	78.00		724	" at witness mound.
	13	80.00		716	" at northeast corner.
	24	71.27		703	Creek.
	25	1.00		707	Ground at witness mound.
	25	80.00		697	" at northeast corner.
	36	41.94		683	Cross lake, south side.
66	1	30.29		717	Ground, highest point, south part of large island.
	13	8.00		689	Ground, witness mound on point of land.
	24	80.00		711	" at northeast corner.
	25	54.25		683	Cross lake, north side of large island.
	36	80.00		684	Ground on small island.
67	1	41.35		724	" highest point small island.
	12	30.46		683	Cross lake, north side.
	12	44.59		699	Ground.
	12	78.00		698	Ground at witness mound.
	13	80.00		713	" northeast corner.
	24	80.00		702	" "
	36	2.00		719	" witness mound.
	36	80.00		714	" northeast corner.
68	1	80.00		696	" "
	12	4.35		691	Wolverine creek.
	12	80.00		707	Ground at northeast corner.
	13	18.00		725	" "
	24	80.00		706	" at north east corner.
	25	80.00		679	" "
	36	12.00		684	" "
	69	1	29.60		657
13		30.93		688	Ground.
13		80.00		667	" at northeast corner..
24		45.37		650	Small lake.
25		64.32		675	Ground.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES

PRINCIPAL MERIDIAN.

MAPS 423, 473

Tp.	Sec.	Distance from SE. Corner.	Elev.	Feature.
69	36	Chs. Lks. 5.30	603	Sipiwesk lake, south side. September.
	36	46.60	649	Ground, highest point on small island.
70	1	49.31	665	" point of land.
	13	4.45	654	" highest point of small island.
	36	23.70	602	Sipiwesk lake, north of large point.
71	13	67.00	686	Ground, highest point on large island.
	24	40.00	641	" at 1/4 post on large island
	36	46.67	602	Sipiwesk lake, north side.
	36	78.00	672	Ground at witness mound.
72	1	40.00	602	Mink lake.
	1	80.00	632	Ground at northeast corner.
	12	40.00	669	" 1/4 post.
	13	80.00	659	" northeast corner.
	24	26.18	633	Creek.
	24	80.00	672	Ground at northeast corner.
	25	40.00	659	" 1/4 post.
	25	80.00	636	" northeast corner.
	36	10.70	632	Creek.
	36	57.50	690	Ground.
	36	76.00	650	" at witness mound.
	36	78.00	630	Landing lake, south side.
73	1	44.20	630	" north "
	1	48.00	645	Ground.
	1	80.00	642	" at northeast corner.
	12	52.10	677	"
	12	78.00	636	" at witness mound.
	13	80.00	672	" northeast corner (flooded).
	24	80.00	688	" "
	25	78.50	660	Creek.
	25	80.00	661	Ground at northeast corner (flooded).
	36	80.00	688	" "
74	1	72.40	646	Mario river flowing east.
	1	80.00	647	Ground at northeast corner.
	12	20.00	654	" (flooded).
	12	56.50	644	Mario river flowing west to Wintering lake.
	12	80.00	657	Ground at northeast corner.
			640	Nathaniel lake, two and a half miles west of line, estimated.
	13	63.70	692	Ground.
	13	80.00	662	" at northeast corner.
24	36.00	684	Crossing of Hudson Bay Railway survey line, about 196 miles from Pas.	

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## PRINCIPAL MERIDIAN.

MAP 473

Tp.	Sec.	Distance from SE. Corner.	Elev.	Feature.
74	24	Chs. Lks. 80.00	Feet. 687	Ground at northeast corner.
	25	36.00	701	"
	36	80.00	674	" northeast corner.
75	1	80.00	652	" "
	12	23.10	647	Creek, flowing south east from Paynter lake.
	12	47.40	649	Paynter lake.
	12	80.00	667	Ground at northeast corner.
	13	16.80	698	"
	13	80.00	640	" northeast corner.
	24	8.20	612	Creek flowing east.
	24	80.00	641	Ground at north east corner.
	25	80.00	653	" "
	36	48.50	624	Creek flowing east.
	36	80.00	637	Ground at northeast corner.
76	1	46.50	666	"
	1	57.50	598	Partridge Crop lake, south side.
	24	41.40	598	" " north "
	24	80.00	645	Ground at northeast corner.
	25	34.20	611	Creek flowing west.
	25	80.00	634	Ground at northeast corner.
77	36	80.00	644	" "
	1	28.50	675	"
	1	72.00	610	" at witness mound.
	12	0.00	598	Bay of Grass river, Partridge Crop lake
	12	14.30	622	Ground.
	12	21.00	598	Grass river, south side.
	12	77.00	598	" north "
	12	80.00	625	Ground at northeast corner
	13	65.00	670	"
	13	80.00	640	" northeast corner.
	24	3.00	598	Partridge Crop lake, south side.
78	1	19.00	598	" north "
	1	21.00	603	Ground at witness mound.
	1	80.00	644	" northeast corner.
			595	Natawahunan lake, twelve miles east of line, estimated.
	12	80.00	654	Ground at northeast corner.
	13	25.50	696	" "
	13	80.00	634	" "
	24	9.00	623	Creek flowing east.
	24	45.70	683	Ground.
	25	15.00	626	Creek flowing east.
	25	53.80	674	Ground.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

PRINCIPAL MERIDIAN.

MAP 473

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
78	25	80.00		643	Ground at northeast corner.
	36	60.50		614	Creek flowing east.
	36	80.00		632	Ground at northeast corner.
79	1	43.00		648	"
	1	80.00		632	" at northeast corner.
	12	80.00		668	" "
	13	80.00		678	" "
	24	68.00		640	" witness mound.
	24	70.04		636	Small lake, south side.
	25	80.00		654	Ground at northeast corner.
	36	36.00		608	Creek flowing west.
	36	80.00		681	Ground at northeast corner.
80	1	80.00		630	" "
	12	17.10		605	Burntwood river, south side.
	12	38.84		605	" north side.
	12	60.00		684	Ground.
	12	80.00		663	" at northeast corner.
	13	80.00		656	" "
	24	3.30		630	Loon lake, south side.
	24	80.00		644	Ground at northeast corner.
	25	44.70		624	Small lake.
	25	80.00		676	Ground at northeast corner.
	36	80.00		691	" "
81	1	37.74		686	Pond.
	1	80.00		677	Ground at northeast corner.
	12	40.00		670	" $\frac{1}{4}$ post.
	12	55.98		662	Creek.
	13	2.00		681	Ground at witness mound.
	13	7.90		668	Small pond.
	13	80.00		671	Ground at northeast corner.
	24	20.40		656	Creek.
	24	40.00		669	Ground at $\frac{1}{4}$ post.
	25	22.60		667	Pond.
	25	50.00		702	Ground.
36	36.89		677	Creek flowing northeasterly.	
36	80.00		679	Ground at northeast corner.	
82	1	17.35		661	Odei river.
	1	40.00		679	Ground at $\frac{1}{4}$ post.
	1	64.68		699	Creek.
	1	80.00		725	Ground at northeast corner.
	12	16.75		731	Swamp water.
	12	44.30		757	Ground. Summit.
	13	1.00		679	Ground at witness mound.
	13	4.81		669	Creek.
	13	40.00		678	Ground at $\frac{1}{4}$ post.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## PRINCIPAL MERIDIAN.

MAP (523)

Tp.	Sec.	Distance from SE. Corner.	Elev.	Feature.
82	24	Chs. Lks. 40.00	697	Ground at $\frac{1}{4}$ post.
	24	80.00	734	" northeast corner.
	25	40.00	740	" $\frac{1}{4}$ post.
	25	80.00	745	" northeast corner.
	36	20.00	683	Swamp water.
	36	40.00	679	Ground at $\frac{1}{4}$ post.
	36	80.00	718	" northeast corner.
	83	1	34.90	670
1		64.00	683	Ground.
1		80.00	677	Surface water at northeast corner
12		80.00	684	Ground at northeast corner.
13		56.45	670	Meridian river.
13		80.00	692	Ground at northeast corner.
24		15.50	690	Swamp water.
24		80.00	738	Ground at northeast corner.
36		2.00	690	" witness mound.
36		78.61	672	Meridian river.
36		81.00	685	Ground at witness mound.
84	1	54.29	811	" Summit.
	1	80.00	748	" at northeast corner.
	12	9.76	740	Pond.
	12	80.00	740	Ground at northeast corner.
	13	54.59	695	Creek.
	13	80.00	753	Ground at northeast corner.
	24	33.50	740	Pond.
	24	80.00	733	Ground at northeast corner.
	25	28.97	705	Pond.
	25	80.00	753	Ground at northeast corner.
	36	80.00	742	" "
85	1	2.45	722	Small lake.
	1	80.00	801	Ground at northeast corner.
	12	12.00	812	"
	12	60.00	740	Meridian river.
	12	80.00	817	Ground at northeast corner.
	13	80.00	819	Swamp water at northeast corner.
	24	40.00	840	Ground at $\frac{1}{4}$ post.
	24	80.00	839	" northeast corner.
	25	80.00	849	" "
	36	20.00	842	Small lake.
	36	80.00	840	Ground at northeast corner.
86	1	40.00	826	Surface water at $\frac{1}{4}$ post.
	1	55.00	822	Gull lake, south side.
	24	35.00	822	" north "
	24	40.00	834	Ground at $\frac{1}{4}$ post.
	25	40.00	872	" "



Phot. by J. A. Fletcher, D.L.S.

Third meridian, looking south from township 57.



LEVELLING OPERATIONS

65

ELEVATIONS OF NATURAL FEATURES.

PRINCIPAL MERIDIAN.

MAP (523)

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
86	25	62.43		865	Swamp water.
	25	80.00		876	Ground at northeast corner.
	36	75.96		868	Small lake.
	36	79.00		874	Ground at witness mound.
87	1	23.52		850	Small lake.
	1	40.00		893	Ground at $\frac{1}{4}$ post, Summit.
	1	80.00		846	" northeast corner.
	12	42.50		811	Swamp water.
	12	80.00		833	Ground at northeast corner.
	13	80.00		861	" " "
	24	32.80		840	Small lake.
	25	20.00		858	Ground.
	25	65.17		893	" Summit.
	27	80.00		845	Swamp water northeast corner.
	36	80.00		868	Ground at northeast corner.
88	1	26.10		856	Creek.
	1	79.00		879	Ground at witness mound.
	12	75.00		801	File river flowing northeast.
	12	76.20		807	Swamp water.
	12	80.00		809	Ground at northeast corner.
	13	40.00		834	Surface water at $\frac{1}{4}$ post.
	13	80.00		842	Ground at northeast corner.
	24	80.00		833	" " "
	25			821	lake, south side.
	36			821	" north side.
	36	1.00		826	Ground at witness mound.
	36	20.00		911	"
	36	80.00		946	Ground at northeast corner.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## SECOND BASE LINE WEST OF PRINCIPAL MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 4.

MAPS 13, 22

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		781	Ground at principal meridian.
	34	0.00		782	" northeast corner
	32	0.00		788	" " "
	31	56.90		796	Low Farm station, Can. Nor. Ry., top of rail.
2	35	0.00		791	Ground at northeast corner.
	34	0.00		794	" "
	32	0.00		801	" "
3	36	0.00		810	" "
	34	0.00		815	" "
	32	0.00		825	" "
4	32	59.15		833	Myrtle Station, Can. Nor. railway.
	36	0.00		838	Ground at northeast corner.
	34	0.00		849	" "
	32	0.00		863	" "
5	36	0.00		883	" "
	34	0.00		896	" "
	32	0.00		910	" "
6	36	0.00		929	" " commences
	34	0.00		963	to ascend rapidly.
	32	0.00		1005	Ground at northeast corner.
	32	40.00		1015	" $\frac{1}{4}$ post.
7	36	0.00		1095	" northeast corner.
	35	0.00		1124	" "
	35	58.00		1260	" "
	34	1.10		1132	Creek.
	34	40.00		1164	Ground at $\frac{1}{4}$ post.
	34	60.00		1351	" "
	34	68.20		1241	Creek in local valley.
	33	0.00		1372	Ground at northeast corner.
	33	29.00		1423	" "
	33	75.00		1285	Creek, flowing to Tobacco creek.
32	0.00		1363	Ground at northeast corner.	
31	0.00		1474	" "	
31	40.00		1563	" $\frac{1}{4}$ post.	
8	36	0.00		1602	" northeast corner.
	36	48.00		1587	Water in swamp.
	35	0.00		1598	Ground at northeast corner.
	33	0.00		1613	" "
	32	38.00		1656	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.  
SECOND BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 4

MAP 12

Tp.	Sec.	Distance from NE Corner.		Elev.	Feature.
		Chs.	Lks.		
8	31	0.00		1633	Ground at northeast corner.
	31	50.00		1613	Water in swamp.
9	36	20.00		1610	Ground.
	35	34.40		1662	" Summit.
	34	36.00		1597	Small lake.
	33	40.00		1624	Ground at $\frac{1}{4}$ post.
	32	0.00		1593	" northeast corner.
10	36	20.60		1575	"
	35	62.10		1610	"
	35	74.00		1577	Water in swamp.
	34	47.00		1613	Ground.
	32	0.00		1506	" at northeast corner.
	31	0.00		1518	" "
	31	40.00		1365	" $\frac{1}{4}$ post.
11	36	1.56		1306	Pembina river June.
	35	0.00		1424	Ground at northeast corner.
	35	28.00		1465	"
	34	0.00		1453	" at northeast corner.
	33	0.00		1456	" "
	33			1308	Swan lake, expansion of Pembina river.
12	36	22.00		1508	Ground.
	35	0.00		1489	" northeast corner.
	34			1495	Canadian Northern railway, between Marieapolis and Greenway, top of rail.
	33	0.00		1488	Ground at northeast corner.
	33	79.80		1419	Creek.
	32	0.00		1442	Ground at northeast corner.
	31	0.00		1415	" "
	31	30.80		1356	Canadian Northern railway, between Marieapolis and Greenway.
	31	32-30		1337	Small lake.
	13	36	0.00		1399
35		79.10		1413	Canadian Northern railway, between Greenway and Glenora.
32		0.00		1425	Ground at northeast corner.
14	36	0.00		1408	" "
	34	0.00		1414	" "
	32	0.00		1433	" "
15	36	20.00		1455	"
	34	0.00		1480	" at northeast corner.

ELEVATIONS OF NATURAL FEATURES.  
 SECOND BASE LINE WEST OF PRINCIPAL MERIDIAN.  
 NORTH BOUNDARY OF TOWNSHIP 4.

MAPS 21, 22

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
15	33	0.00		1486	Ground at northeast corner.
	32	0.00		1507	" "
	31	2.00		1531	Water in swamp.
16	36	0.00		1611	Ground at northeast corner.
	34	0.00		1526	" "
	33	0.00		1509	" "
	33	12.00		1348	Pelican lake.
	32	40.00		1512	Ground at $\frac{1}{4}$ post.
	32	72.90		1383	Creek in local valley.
17	31	40.00		1520	Ground at $\frac{1}{4}$ post.
	35	0.00		1515	" northeast corner.
	34	0.00		1516	" "
18	32	0.00		1525	" "
	36	0.00		1549	" "
	34	0.00		1570	" "
19	32	0.00		1592	" "
	36	0.00		1619	" "
	34	0.00		1623	" "
20	32	0.00		1633	" "
				1597	Minto station, Canadian Northern railway, top of rail, 4 miles north of line.
				1600	Minto station, Great Northern railway.
	35	0.00		1644	Ground at northeast corner.
21	34	0.00		1643	" "
	32	0.00		1623	" "
	36	0.00		1619	" "
22	34	0.00		1625	" "
	32	0.00		1635	" "
	36	0.00		1636	" "
	34	0.00		1634	" "
23	33	44.00		1641	" beginning of descent.
	32	40.00		1626	" at $\frac{1}{4}$ post.
24	36	0.00		1610	" northeast corner.
	34	0.00		1600	" "
	32	0.00		1569	" "
24	36	0.00		1504	" "
	34	0.00		1464	" "
	33			1459	Water in swamp.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.  
SECOND BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 4.

MAP 21

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
24	32	Chs. 0.00	1468	Ground at northeast corner.
	32	71.00	1453	Water in swamp.
25	36	0.00	1447	Ground at northeast corner.
	35	76.09	1452	Canadian Pacific railway, between Lander and Napinka, mileage 46+23
	34	40.00	1451	Ground at $\frac{1}{4}$ post.
	32	0.00	1453	" northeast corner.
	32	63.26	1388	Souris river. Depression.
26	36	0.00	1446	Ground at northeast corner.
	34	0.00	1448	" "
	32	0.00	1457	" "
27	36	0.00	1452	" "
	34	0.00	1479	" "
	32	0.00	1483	" "
	31	5.60	1487	Jackson creek.
28	36	0.00	1515	Ground at northeast corner.
	36	31.80	1502	Jackson creek.
	34	0.00	1530	Ground at northeast corner.
	32	0.00	1548	Ground at northeast corner.
29	36	0.00	1567	" "
	34	0.00	1606	" "
	32	0.00	1634	" "
30	36	0.00	1660	" "
	34	0.00	1674	" "
	32	0.00	1699	" "
	31	20.80	1680	Gainsborough creek.
31	36	0.00	1713	Ground at northeast corner.
	34	0.00	1758	" "
	32	0.00	1773	" "
32	36	0.00	1785	" "
	34	0.00	1793	" "
	33	40.00	1779	" $\frac{1}{4}$ post.
	32	33.00	1815	" "
33	36	0.00	1809	" at northeast corner.
	35	23.00	1837	" "
	34	0.00	1827	" at northeast corner.
			1864	Alida station, Canadian Pacific railway, $2\frac{1}{2}$ miles north of line.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## SECOND BASE LINE WEST OF PRINCIPAL MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 4.

MAP 21

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
33	32	Chs. lks. 0.00	Feet. 1839	Ground at northeast corner.
34	36	0 00	1843	" "
	35	20.00	1800	"
	34	0.00	1836	" at northeast corner.
	33	11.96	1840	" at second meridian.

ELEVATIONS OF NATURAL FEATURES.  
THIRD BASE LINE EAST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 8  
(HUNTING EAST.)

MAP 23

Rge.	Sec.	Distance from NW. Corner.		Elev.	Feature.
		Chs.	Lks.		
1E	31	0.00		780	Ground at principal meridian.
	31	81.50		782	" northeast corner.
	32	68.12		782	Canadian Northern railway, between Sanford and Oak Bluff stations.
	33	81.52		779	Ground at northeast corner.
	35	81.57		779	" "
	36	81.57		775	" "
2E	32	81.60		774	" "
	33	68.49		777	Canadian Pacific railway between Lasalle and Fort Whyte stations.
				777	Lasalle station, one and a quarter miles south of line.
	34	81.50		774	Ground at northeast corner.
				767	Along south boundary of lot 64, St. Norbert Parish:—
				737	Bank of Rivière Sale.
				771	Rivière Sale, water.
				767	Canadian Northern railway between Cartier and St. Norbert stations.
				731	Along south boundary of lot 188:—
				731	Bank of Red river.
4E	31	0.82		775	Red river, water.
	31	81.80		773	Canadian Pacific railway between Willard and Grande Pointe stations.
	32	81.50		775	Ground at northeast corner.
	33	81.72		777	" "
	34	81.50		779	" "
	35	81.57		782	" "
	36	81.50		785	" "
	5E	34	81.50		800
35		81.50		802	" "
36		82.78		806	" "
6E	31	81.50		810	" "
	32			812	" "
	33	49.62		808	Seine river, water.
				813	Dufresne station, Canadian Northern railway, one and a half miles north of line.
	33	81.50		813	Ground at northeast corner.
	34	47.56		820	Canadian Northern railway between Ste. Anne and Dufresne stations.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## THIRD BASE LINE EAST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 8.  
(RUNNING EAST.)

## MAP 23

Rge.	Sec.	Distance from NW. Corner.	Elev.	Feature.
6E	34	Chs. Lks. 81.50	Feet. 817	Ground at northeast corner.
	35	81.50	822	" "
	36	80.70	828	" "
7E	31	81.71	837	" "
	32	82.97	855	" "
	33	47.16	862	Creek.
	33	81.49	872	Ground at northeast corner.
	34	81.50	886	" "
	35	81.50	896	" "
	36	81.56	902	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

EAST OF RANGE 7, EAST OF PRINCIPAL MERIDIAN.

MAP 73

Rge.	Sec.	Distance from SE. Corner.	Elev.	Feature.
8	36	Chs. Lks. 80.00	902	Ground at northeast corner.
9	1		904	" "
	12	40.00	901	" 1/4 post.
	13	20.00	898	Water in marsh.
	13	45.00	894	" "
	24	40.00	894	Ground at 1/4 post.
	24		898	" northeast corner.
	25		908	" "
	36		903	" "
10	1		893	" "
	1	36.30	898	" "
	12		893	" at northeast corner.
	13		893	" "
	24		888	" "
	25	37.80	897	" "
	36	66.71	892	Grand Trunk Pacific railway between Vivian and Anola stations.
			907	Vivian station, Grand Trunk Pacific railway, 1 1/2 miles east of line.
	36		887	Ground at northeast corner.
11	1		875	" "
	12		871	" "
	13	40.00	872	Water in swamp.
	13		873	Ground at northeast corner.
	24		867	" "
	25		840	Water in hay marsh at north east corner.
	36		836	Ground at northeast corner.
12	1		832	" "
	12	21.00	831	Water in marsh.
	12	63.12	839	Canadian Pacific railway, between Lydiatt and Norquay stations.
	13	52.73	847	Ground.
	13		834	" at northeast corner.
	24		818	" "
	25		804	" "
	36	48.05	804	Canadian Pacific railway, between Sinnot and Beausejour stations.
	36		821	Beausejour station, Canadian Pacific railway, three-quarters of a mile east of line.
	36		803	Ground at northeast corner.
13	1		794	" "
	12		788	" "
	13		788	" "

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## EAST OF RANGE 7, EAST OF PRINCIPAL MERIDIAN.

MAP 73

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
14	24			783	Ground at northeast corner.
	25			778	" "
	36			781	" "
	1			771	" "
	12			771	" "
	13			764	" "
15	24			758	" "
	25			756	" "
	36			756	" "
	1			750	" "
	12			751	" "
	13	61.50		740	" "
16	13	66.86		731	Brokenhead river.
	13			744	Ground at northeast corner.
	24	49.80		729	Brokenhead river.
	24			750	Ground at northeast corner.
	25			752	" "
	36			762	" "
16	1			780	" "
	12			793	" "
	13			828	" "
	24			847	" "
	25			863	" "
	36	27.80		880	Ground Summit.
	36			838	Ground at northeast corner.
				837	(A line was run from here westerly to Lake Winnipeg.)
				717	Gull lake.
					Lake Winnipeg, northwest of tp. 16, rge. 7. (Jan., 1914.)

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.  
FIFTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 16

MAP 71

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.	
31		Chs. Lks.	Feet.		
	36	0.00	1619	Ground at northeast corner.	
	36	40.00	1661	" 1/4 post.	
	35	0.00	1670	" northeast corner.	
	35	40.00	1687	" 1/4 post.	
	34	0.00	1692	" northeast corner.	
	33	0.00	1695	" "	
	33	40.00	1699	" 1/4 post.	
	32	0.00	1699	" northeast corner.	
	32	40.00	1698	" 1/4 post.	
				1717	Rocanville station, Canadian Pacific railway, two miles south of line.
		31	0.00	1702	Ground at northeast corner.
		31	71.00	1704	"
		31	77.13	1633	Crossing of Canadian Pacific railway between Rocanville and Tantallon stations.
	32	36	0.00	1582	Ground at northeast corner.
36		3.41	1564	Scissors creek, flowing to Qu'Appelle river.	
			1705	Ground.	
36		40.00	1599	" at 1/4 post.	
35		0.00	1714	" northeast corner.	
35		40.00	1735	" 1/4 post.	
35		56.43	1696	Creek.	
34		0.00	1742	Ground at northeast corner.	
34		40.00	1757	" 1/4 post.	
33		0.00	1774	" northeast corner.	
33		18.00	1785	Water in swamp.	
33		40.00	1794	Ground at 1/4 post.	
32		0.00	1810	Ground at northeast corner.	
32		40.00	1831	" 1/4 post.	
31		0.00	1844	" northeast corner.	
31	40.00	1853	" 1/4 post.		
33	36	0.00	1861	" northeast corner.	
	36	40.00	1869	" 1/4 post.	
	35	0.00	1867	" northeast corner.	
	35	40.00	1876	" 1/4 post.	
	34	0.00	1887	" northeast corner.	
	34	40.00	1906	" 1/4 post.	
	33	0.00	1918	" northeast corner.	
	33	40.00	1924	" 1/4 post.	
	32	0.00	1940	" northeast corner.	
	32	15.00	1938	Water in pond.	
	32	40.00	1954	Ground at 1/4 post.	
	32	75.00	1959	Ground.	

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## SIXTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 20.

MAP 121

Rgc.	Sec.	Distance from NE. Corner.	Elev.	Feature.	
31	36	0.00	1671	Ground at northeast corner.	
		7.46	1672	Water in pond.	
					Many ponds along line in ranges 31 to 33, elevation of water varying from 1663 to 1691.
		36	40.00	1676	Ground at $\frac{1}{4}$ post.
		35	0.00	1685	" northeast corner.
		35	40.00	1688	" $\frac{1}{4}$ post.
		34	0.00	1689	" northeast corner.
		34	36.40	1704	" Summit.
		34	40.00	1698	" $\frac{1}{4}$ post.
		33	0.00	1692	" northeast corner...
		33	40.00	1684	Water in pond at $\frac{1}{4}$ post.
		32	0.00	1691	" at northeast corner.
		32	40.00	1690	Ground at $\frac{1}{4}$ post.
		31	0.00	1685	" northeast corner.
		31	34.70	1663	Water in pond, lowest elevation, except Cutarm river.
		31	40.00	1665	Ground at $\frac{1}{4}$ post.
	32	36	0.00	1683	" northeast corner.
		36	40.00	1683	" $\frac{1}{4}$ post.
		35	0.00	1695	" northeast corner.
35		45.87	1701	" Summit.	
34		0.00	1684	" at northeast corner.	
33		0.00	1682	" "	
33		40.00	1680	" $\frac{1}{4}$ post.	
32		0.00	1671	" northeast corner.	
31		0.00	1680	" "	
31		40.00	1683	" $\frac{1}{4}$ post.	
33	36	0.00	1677	" northeast corner.	
	36	40.00	1673	" $\frac{1}{4}$ post.	
	36	64.66	1567	Cutarm river, lowest elevation on line.	
	35	0.00	1665	Ground at northeast corner.	
	35	40.00	1676	" $\frac{1}{4}$ post.	
	34	0.00	1675	" northeast corner.	
	34	40.00	1683	" $\frac{1}{4}$ post.	
	33	0.00	1684	Water in pond.	
	33	29.67	1692	Ground at second meridian.	

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.  
SEVENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 24.

MAP 121

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
31	36	0.00		1706	Ground at northeast corner.
	36	33.10		1717	Canadian Northern railway between MacNutt and Calder Stations.
	36	40.00		1711	Water in pond. Many ponds along line in ranges 31 to 33, elevation of water varying from 2 to 10 feet below surrounding lands.
	35	0.00		1715	Ground at northeast corner.
	35	20.00		1720	Ground.
	35	40.00		1716	" at $\frac{1}{4}$ post.
	34	0.00		1722	" northeast corner.
	34	40.00		1732	" $\frac{1}{4}$ post.
	33	0.00		1733	" northeast corner.
				1735	Calder Station, Canadian Northern railway, two miles north of line.
	33	40.00		1740	Ground at $\frac{1}{4}$ post.
	32	28.80		1754	"
	32	40.00		1750	" $\frac{1}{4}$ post.
	32	78.00		1746	Water in pond.
	31	0.00		1749	Ground at northeast corner.
	31	40.00		1755	" $\frac{1}{4}$ post.
32	36	0.00		1757	" at northeast corner.
	36	40.00		1762	" $\frac{1}{4}$ post.
	35	0.00		1766	" northeast corner.
	35	40.00		1761	" $\frac{1}{4}$ post.
	34	0.00		1765	" northeast corner.
	34	40.00		1762	Water in pond.
	33	0.00		1763	Ground at northeast corner.
	33	14.16		1772	" Summit.
	33	40.00		1765	" at $\frac{1}{4}$ post.
	32	0.00		1759	Water in pond at northeast corner.
	32	40.00		1761	Ground at $\frac{1}{4}$ post.
	31	0.00		1757	" northeast corner.
	31	40.00		1750	Water in pond at $\frac{1}{4}$ post.
33	36	0.00		1749	Water in pond.
	36	40.00		1751	Ground at $\frac{1}{4}$ post.
	36	56.83		1750	Water in pond.
	35	0.00		1748	" at northeast corner.
	35	40.00		1754	Ground at $\frac{1}{4}$ post.
	35	75.86		1744	" second meridian.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## EIGHTH BASE LINE EAST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 28.  
(RUNNING EAST.)

MAP 173

Rge.	Sec.	Distance from NW. Corner.	Elev.	Feature.
		Chs. Lks.	Feet.	
1	31		746	Ground at principal meridian.
	31	80.00	733	" northeast corner.
	32	80.00	732	" "
	33	80.00	743	" "
	34	61.52	726	Creek flowing south to Fisher river.
	35	52.30	734	Ground.
	35	71.89	719	Creek flowing south to Fisher river.
2	36	60.00	728	Ground.
	31	40.00	723	" at $\frac{1}{4}$ post.
	32	7.00	716	Fisher bay, lake Winnipeg, west side.
3	36	78.00	716	" " east side.
	31	20.00	724	Ground.
	32	80.00	730	" at northeast corner.
	33	80.00	737	" "
	34	55.00	736	Ground.
	35	5.00	735	" "
	35	80.00	738	" at northeast corner.
4	36	47.00	746	" "
	31	5.00	741	" "
	31	80.00	749	" at northeast corner.
	32	80.00	743	" "
	33	80.00	743	" "
	35	4.00	764	" Summit.
	35	80.00	738	" at northeast corner.
5	36	80.00	738	" "
	31	40.00	737	" $\frac{1}{4}$ post.
	32	20.00	745	" "
	32	80.00	732	" at northeast corner.
	33	53.80	717	Lake Winnipeg July

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.  
NINTH BASE LINE EAST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 32.  
(RUNNING EAST.)

MAP 173

Rge.	Sec.	Distance from NW. Corner.	Elev.	Feature.
1	31	0.00	723	Lake St. Patrick (principal meridian).
	31	19.00	734	Ground.
	31	29.00	747	Ground, top of ridge.
	31	40.00	741	" at $\frac{1}{4}$ post.
	31	80.00	734	" at northeast corner.
	32	27.00	748	" top of ridge.
	32	40.00	733	" at $\frac{1}{4}$ post.
			720	Lake St. George.

## ELEVATIONS OF NATURAL FEATURES.

## NINTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 32.

MAPS 173, 172

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		723	Lake, St. Patrick. August.
	36	61.00		743	Ground.
	35	10.00		731	"
	34	0.00		757	" at northeast corner.
	34	60.50		780	" Summit.
	33	38.00		760	"
	32	0.00		761	" at northeast corner.
	32	40.00		755	" $\frac{1}{4}$ post.
	31	23.00		777	"
	31	46.00		767	"
2	36	0.00		774	" at northeast corner.
	35	30.00		782	" Summit.
	34	0.00		766	" at northeast corner.
	33	50.00		748	"
	32	0.00		743	" at northeast corner.
	31	0.00		736	" "
3	36			724	Creek flowing north to Mantagao river.
	35	0.00		730	Ground at northeast corner.
	35			716	Mantagao river, lowest elevation on line, almost same as lake Winnipeg.
	34	0.00		729	Ground at northeast corner.
	33	0.00		736	" "
	32	0.00		763	" "
	32	16.70		763	Creek flowing north.
	31	0.00		783	Ground at northeast corner.
4	36	0.00		790	" "
	35	0.00		808	" "
	34	5.70		840	" highest point on line.
	33	0.00		836	" at northeast corner.
	32	0.00		829	" "
	31	39.86		817	" $\frac{1}{4}$ post.
5	36	0.00		817	" northeast corner.
	35	0.00		819	" "
	34	0.00		812	" "
	33	0.00		810	Ground.
	32	0.00		808	" at northeast corner.
	31	0.00		808	" "
6	36	0.00		808	" "
	36	39.86		802	" $\frac{1}{4}$ post.
	36			801	Lake St. Martin, east side, September.
	33	25.70		805	Ground at witness mound on point of land.
	33			801	Lake St. Martin.



Photo by J. R. ARKISS, U. S. G.  
Building mound at NE. corner township 112, range 19, west of Fifth meridian.



# MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



4.5

5.0

5.6

6.3

7.1

8.0

9.0

10

11.2

12.5

14.3

16

18

20

22.5

25

28

31.5

36

40

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50

56

63

71



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(716) 482-0300 - Phone  
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LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.  
TENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

MAP 222

NORTH BOUNDARY OF TOWNSHIP 36.

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.	
5	32	Chs.	Lks.	Feet.	Lake Winnipeg. October, 1912. " " high water mark. Ground at northeast corner.
				715	
			721		
	31	0.00		744	
6	36	0.00		745	" "
	35	0.00		752	" "
	35	40.00		764	" 1/4 post.
	34	0.00		759	Water in flooded bog land.
	33	0.00		765	Ground at northeast corner.
	33	33.00		783	" "
	32	0.00		774	" at northeast corner.
	31	0.00		785	" "
7	36	0.00		779	" "
	35	0.00		778	" "
	34	0.00		778	" "
	33	0.00		781	" "
	32	0.00		777	" " (flooded).
	31	0.00		773	" "
	31			772	Warpath river.
8	36	0.00		781	Ground at north east corner.
	35	0.00		788	" "
	34	0.00		796	" "
	33	0.00		801	" "
	32	0.00		803	" " (flooded).
	31	0.00		821	" "
9	36	0.00		816	" "
	35	0.00		819	" "
	35			819	Lake.
	34	40.00		820	Ground at 1/4 post.
	33	0.00		833	" northeast corner.
	32	0.00		822	" " (flooded).
	31	0.00		821	" "
10	36	0.00		833	" "
	36	40.00		820	" 1/4 post (flooded).
	35	0.00		821	" northeast corner.
	34	0.00		823	" "
	33	0.00		833	" "
	33	40.00		838	" 1/4 post (flooded).
	32	0.00		844	" northeast corner.
	31	0.00		852	" " (flooded).
11	36	0.00		868	" "
	36	60.00		868	Bog land.

ELEVATIONS OF NATURAL FEATURES.  
TENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 36.

MAP 222

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks.	Feet.	
11	35	0.00	868	Ground at northeast corner.
	34	0.00	877	" "
	33	0.00	880	" "
	33	43.80	910	" Summit.
	32	0.00	898	" at northeast corner.
	31	0.00	902	" "
12	36	0.00	897	" "
	35	0.00	908	" "
	35	20.00	900	Bog land.
	34	0.00	899	Ground at northeast corner. (flooded.)
	33	0.00	908	" "
	32	0.00	910	" "
	31	0.00	911	" "
13	36	0.00	916	" "
	35	0.00	914	" "
	34	0.00	920	" "
	33	0.00	915	" "
	32	0.00	905	" "
	31	0.00	899	" (flooded).
14	36	0.00	899	" "
	36	40.00	893	" $\frac{1}{4}$ post (flooded).
	35	0.00	893	" northeast corner.
	35	35.00	880	" (flooded).
	34	0.00	895	" "
	34	20.00	875	Shallow lake.
	33	0.00	892	Ground at northeast corner.
	32	0.00	869	" "
	31	0.00	859	Small lake at northeast corner.
	31	23.00	870	Ground.
	31	50.00	845	Small lake.
15	36	0.00	853	Ground at northeast corner.
	35	0.00	839	" "
	35	40.00	830	" $\frac{1}{4}$ post.
	35	53.00	833	" witness mound.
	34	0.00	830	Waterhen lake.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.  
ELEVENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

MAPS 222, 221

NORTH BOUNDARY OF TOWNSHIP 40.

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
16	36	Chs. Lks. 0.00	Feet. 847	Ground at northeast corner.
	35	0.00	844	Lake at northeast corner.
	35	75.00	837 834	Ground at witness mound. Lake Winnipegosis.
17	32	0.00	885	Ground at northeast corner on Birch Island.
	31	0.00	868	Ground at northeast corner.
18	36	0.00	853	" "
	35	0.00	840	" "
	31	0.00	834 843	Lake Winnipegosis. Ground at northeast corner on mainland.
19	36	0.00	862	Ground at northeast corner.
	35	0.00	865	" "
	34	0.00	870	" "
	33	0.00	870	" "
	32	0.00	866	" "
	31	0.00	864	" "
20	36	0.00	873	" "
	35	0.00	857	" "
	34	0.00	857	" "
	34	63.00	841	" witness mound.
	34		838	Pelican lake, east side.
21	34		838	" west side.
	33	0.90	845	Ground at northeast corner.
	33		838	Pelican creek.
	32	0.00	847	Ground at northeast corner.
	32		841	Creek, flowing to Pelican lake.
	31	0.00	886	Ground at northeast corner.
22	36	0.00	903	" "
	35	0.00	930	" "
	34	0.00	929	" "
	33	0.00	921	" "
	32	0.00	920	" "
	31	0.00	877	Ground at northeast corner.
	31		849	Swan lake, east side.
24	34		849	" west side.
	34		849	Woody river.
	33	5.00	851	Ground.
	31		850	River flowing to Swan lake.
	31	0.00	857	Ground at northeast corner.
	31	54.13	874	"
25	36	0.00	869	" at northeast corner.

## TOPOGRAPHICAL SURVEYS BRANCH

ELEVATIONS OF NATURAL FEATURES  
TWELFTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 44.

MAPS (272), 271

Tge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
16	34			834	Lake Winnipegosis.
	33	0.00		838	Ground at northeast corner on small island.
18	33	14.10		859	Highest point on Grand island.
	33	40.00		839	Ground at $\frac{1}{4}$ post on Grand island.
	33	75.00		840	" witness mound on Grand island.
19	32	40.00		842	Ground at $\frac{1}{4}$ post on mainland.
	31	0.00		861	" northeast corner.
	31	61.00		872	" Summit.
20	36	0.00		845	" northeast corner.
	35	0.00		844	Small lake at northeast corner.
	34	0.00		870	Ground at northeast corner.
	33	0.00		839	" "
				834	Bay of Lake Winnipegosis.
21	34	0.00		838	Ground at northeast corner.
	34	76.00		839	" witness mound.
	32	0.00		851	" northeast corner.
	32	26.00		841	Creek.
	31	0.00		850	Ground at northeast corner.
22	36	0.00		877	" "
	35	0.00		878	" "
	35	20.00		879	Pond.
	34	0.00		890	Ground at northeast corner.
	33	0.00		883	" "
	32	0.00		863	" "
	32	40.00		841	" $\frac{1}{4}$ post.
				834	Bay of Lake Winnipegosis.
23	35	0.00		863	Ground at northeast corner on point of land.
				834	Bay of Lake Winnipegosis.
24	31	25.00		858	Ground at witness mound, approximate.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES  
 THIRTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.  
 NORTH BOUNDARY OF TOWNSHIP 45.

MAP (272)

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
13				715	Lake Winnipeg 33 ft east of northeast corner of section 34. June 12, 1914 (southeasterly wind.)
	34	1.00		727	Ground at witness mound.
	34	20.18		726	Creek, 2 ft. wide, 2 ft. deep.
	34	26.00		730	Swamp water.
	34	60.00		780	Ground.
	33	0.00		803	" at northeast corner.
	33	40.00		841	" $\frac{1}{4}$ post.
	32	0.00		840	" northeast corner.
	31	0.00		793	" "
	31	17.52		789	Creek, 3 ft. wide, 1 ft. deep.
	31	40.00		816	Ground at $\frac{1}{4}$ post.
14	36	0.00		832	" northeast corner.
	35	0.00		831	" "
	34	0.00		844	" "
	33	0.00		849	" "
	33	60.00		834	" "
	32	0.00		839	" northeast corner.
	31	0.00		851	" "
31	5.40		815	"Cross" lake, east side.	
15	35	25.00		822	Ground on island
	35	67.50		815	"Cross" lake, west side.
	34	0.00		836	Ground at northeast corner.
	33	0.00		828	" "
	33	40.00		829	" $\frac{1}{4}$ post, top of bank.
	33	40.40		823	Saskatchewan river, east side.
	33	52.00		830	Ground on island.
	32	3.00		823	Saskatchewan river, west side.
	32	4.00		850	Ground at witness post.
	32	4.79		857	Saskatchewan river, top of bank.
	32	20.00		836	Ground.
	31	0.00		848	" northeast corner.
	31	40.00		854	" $\frac{1}{4}$ post.
16	36	0.00		843	" northeast corner.
	36	20.00		831	Ground.
	35	0.00		847	" at northeast corner.
	35	20.00		841	" "
	35	41.00		830	Cedar lake, east side of lake.
	34	0.00		839	Ground at northeast corner of small island.
17	33	0.00		836	Ground on northeast corner on point of land.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## THIRTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

MAPS (272), 271

NORTH BOUNDARY OF TOWNSHIP 48.

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
17	32	Chs. Lks. 4.00	Feet. 836	Ground at witness mound on another point of land.
	32	24.00	830	Cedar lake, east side of Rabbit point.
	32	40.00	839	Ground at $\frac{1}{4}$ post on Rabbit point.
20	32	74.00	830	Cedar lake, west side of lake.
	31	4.00	838	Ground at witness mound.
	31	40.00	847	" $\frac{1}{4}$ post.
21	36	0.00	856	" northeast corner.
	35	0.00	870	" "
	34	0.00	878	" "
	33	0.00	894	" "
	32	0.00	899	" "
	31	0.00	902	" "
22	36	0.00	916	" "
	35	0.00	928	" "
	35	60.00	939	" "
	35	74.23	930	" Summit. crossing of dog trail from Cheminawawin to Swamp creek.
	34	0.00	931	Ground at northeast corner.
	34	20.00	937	" "
	33	0.00	885	" at northeast corner.
			834	Lake Winnipegosis, February 26, 1914, at mouth of Swamp creek about $1\frac{1}{2}$ miles southeast of northeast corner of section 32.
	33	20.00	867	Ground.
	33	57.90	834	Swamp creek, flowing southeast.
32	0.00	841	Ground at northeast corner.	
31	0.00	842	" "	
23	36	0.00	845	" "
	35	0.00	860	" "
	35	61.97	840	Small creek, 1.7 ft. deep, flowing north- east to Swamp creek.
	34	0.00	849	Ground at northeast corner.
	33	0.00	863	" "
	32	0.00	867	" "
	31	0.00	864	" "
	31	0.00	864	" "
24	36	0.00	865	" "
	35	0.00	867	" "
	35	15.46	863	Small creek, flowing southeast to Lake Winnipegosis.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

THIRTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 48.

MAP 271

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
24	34	0.00		878	Ground at northeast corner.
	33	0.00		875	" "
	32	0.00		879	" "
	31	0.00		889	" "
25	36	0.00		884	" "
	35	0.00		888	" "
	34	0.00		899	" "
	33	0.00		907	" "
	32	0.00		883	" " Summit.
	32	26.80		879	Creek, flowing south to Lake Winni- pegosis.
	31	0.00		879	Ground at northeast corner.
26	36	0.00		874	" "
	35	0.00		877	" "
	34	0.00		875	" "
	34	60.00		879	" "
	33	0.00		880	" northeast corner.
	32	0.00		873	" "
	31	0.00		871	" "
	31	49.52		862	Overflowing river, flowing S.E., east side.
	31	53.00		862	" " " west "
					Slow current, no rapids for some miles above this crossing but many rapids between here and Lake Winnipegosis.
	31	60.00		870	Ground.
	31	67.00		863	Creek flowing northeast.
27	36	0.00		875	Ground at northeast corner.
	35	0.00		874	" "
	34	0.00		874	" "
	33	0.00		877	" "
	32	0.00		875	" "
	32	10.55		863	Santon river, flowing northeast to Overflowing river.
	31	0.00		876	Ground at northeast corner.
28	36	0.00		879	" "
	35	0.00		883	" "
	34	0.00		891	" "
	33	0.00		899	" "
	32	0.00		927	" "
	31	0.00		937	" "
29	36	0.00		946	" "
	35	0.00		967	" "

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## THIRTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

MAP 271

NORTH BOUNDARY OF TOWNSHIP 48.

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
29	34	0.00		988	Ground at northeast corner.
	33	0.00		997	" "
	32	0.00		1002	" "
	32	40.00		1006	" $\frac{1}{4}$ post.
	31	0.00		1001	" northeast corner.
	31	39.15		992	Overflowing river flowing northeast.
	31	40.00		993	Ground at $\frac{1}{4}$ post.
30	36	0.00		996	" northeast corner.
	35	0.00		1003	" "
	34	0.00		1012	" "
	33	0.00		1016	" "
	32	0.00		1015	" "
	31	0.00		1015	" "
31	36	0.00		1016	" "
	35	0.00		1019	" "
	34	0.00		1021	" "
	33	0.00		1023	" "
	32	0.00		1031	" "
	31	0.00		1042	" "
32	36	0.00		1049	" "
	36	40.00		1051	" $\frac{1}{4}$ post.
				1051	" second meridian

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

FOURTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 52.

MAP (322)

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
11	31	37.26		714	Lake Winnipeg, strong southerly wind, floating ice
	31	40.00		718	Ground at $\frac{1}{4}$ post.
12	36	0.00		734	" northeast corner.
	35	0.00		747	" "
	34	0.00		746	" "
	34	44.73		736	Sturgeongill creek, 26 ft. w., 7 ft. d.
	33	0.00		748	Ground at northeast corner.
	32	0.00		757	" "
	32	52.65		754	Creek, 4 ft. wide, 3 ft. deep.
	32	77.00		763	Water in swamp.
	31	0.00		764	Ground at northeast corner,
	31	40.00		812	" $\frac{1}{4}$ post.
13	36	0.00		882	" northeast corner.
	35	0.00		886	" "
	34	0.00		895	" "
	33	0.00		898	" "
	32	0.00		912	" "
	31	0.00		911	" "
14	36	0.00		925	" "
	35	0.00		917	" "
	35	38.25		880	Lake, east side.
	34	0.00		900	Ground at northeast corner.
	33	0.00		891	Lake at northeast corner.
	32	0.00		896	Ground at northeast corner.
	32	23.40		930	" summit.
	31	0.00		917	" northeast corner.
	31			905	Pr "
15	36	0.00		929	Ground at northeast corner.
	35	0.00		899	" "
	35	2.00		894	Small lake.
	34	0.00		894	Ground at northeast corner.
	33	0.00		918	" "
	32	0.00		904	" "
	32	52.50		890	Lake, east side.
16	36	33.77		890	Lake, west side.
	35	0.00		892	Ground at northeast corner.
	35	49.00		890	Small lake.
	34	0.00		903	Ground at northeast corner.
	33	0.00		917	" "
	32	0.00		920	" "
	31	0.00		876	" "

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES

## FOURTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

MAP 321

NORTH BOUNDARY OF TOWNSHIP 42.

Rtge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
16	31	40.00		915	Ground at $\frac{1}{4}$ post. Lake, east side, February 1, 1914.
	31	61.60		862	
17	35	45.00		862	" west "
	34	0.00		877	Ground at northeast corner.
	33	0.00		891	" "
	33	40.00		892	" $\frac{1}{4}$ post.
	32	0.00		887	" northeast corner.
	31	0.00		88c	" "
18	36	0.00		856	" "
	35	0.00		856	" "
	34	0.00		845	" "
	34	24.80		829	Cedar lake, east side of lake.
	33	0.00		836	Ground at northeast corner.
	32	0.00		839	" "
	32	32.65		829	Cedar lake, east side of bay.
19	36	43.80		829	" west "
	35	0.00		836	Ground at northeast corner.
	35	40.00		846	" $\frac{1}{4}$ post.
	34	0.00		835	" northeast corner.
	34	9.75		829	Cedar lake, east side of another bay.
	31	5.00		829	" west " bay and lake.
20	36	0.00		835	Ground at northeast corner.
	35	0.00		835	" "
	35	30.00		836	Creek, no current.
	35	61.00		837	Small lake.
	34	0.00		838	Ground at northeast corner.
	33	10.00		838	" witness mound.
	33	31.70		833	Saskatchewan river.
				837	" high water mark.
	33	35.00		841	" top of bank.
	32	0.00		836	Ground at northeast corner.
	31	0.00		835	" "
21	36	0.00		833	Marshy lake at northeast corner.
	36	19.00		838	Ground at witness m
	36	21.00		836	Creek.
	35	0.00		837	Marsh water at northeast corner.
	34	0.00		838	Ground at northeast corner.
	34	67.00		832	Saskatchewan river,
	34	70.00		842	" top of bank.
	33	0.00		839	Ground at northeast corner.
	33	6.00		839	Small lake.
	32	0.00		839	Ground at northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES  
FOURTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 53.

MAP 321

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
21	32	15.00	836	Pond.
	31	0.00	836	Ground (swamp) at northeast corner.
	31	40.00	836	Swamp water.
22	36	0.00	835	" at northeast corner.
	35	0.00	839	Ground at northeast corner.
	35	40.60	834	Saskatchewan river (channel of east branch).
	34	0.00	839	Lake at northeast corner.
	33	0.00	839	Ground at northeast corner.
	33	50.00	839	Swamp water.
	32	0.00	839	Ground at northeast corner.
	32	31.50	835	Saskatchewan river, east branch, flowing southeast.
	31	0.00	839	Ground at northeast corner.
	31	36.00	835	Saskatchewan river, east branch, flowing northeast.
	31	40.00	840	Ground at 1/4 post.
	31	70.05	835	Saskatchewan river, east side of northerly bend.
23	36	16.06	835	Saskatchewan river, west side of northerly bend.
	36	17.00	841	Ground at witness mound.
	35	0.00	840	Lake at northeast corner.
	35	34.05	844	Saskatchewan river, top of east bank.
	35	34.25	835	" east side (water low).
			842	" high water mark.
	35	45.05	835	" west side.
	34	0.00	840	Ground at northeast corner.
	34	26.00	837	Creek, flowing north.
	34	64.00	839	Lake.
	33	0.00	840	Ground at northeast corner.
	33	56.80	836	Creek, 53 ft. w., 2.5 ft. d., flowing north.
	32	0.00	841	Swamp water at northeast corner.
	32	29.21	840	Creek, flowing northeasterly.
	32	40.40	839	Lake, west side, December 13, 1914.
31	60.00	839	" east "	
24	36	0.00	841	Ground at northeast corner
	35	0.00	873	" "
	34	0.00	887	" "
	33	0.00	885	" "
	33	34.00	880	Swamp water.
	32	0.00	886	Ground at northeast corner.
	31	0.00	890	" "

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## FOURTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 52.

MAP 321

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
24	31		21.63	885	Creek, 8 ft. wide, flowing northeast.
25	36	0.00		894	Ground at northeast corner.
	35	0.00		906	" "
	35	45.00		906	Swamp water.
	34	0.00		913	Ground at northeast corner.
	33	0.00		923	" "
	33	29.00		924	Creek, 10 ft. wide.
	32	0.00		936	Ground at northeast corner.
	32	32.00		939	Swamp water.
	31	0.00		947	Ground at northeast corner.
26	36	0.00		953	" "
	35	0.00		963	" "
	35	55.00		969	Creek, 2 ft. wide, 6 in. deep, no perceptible current.
	34	0.00		973	Ground at northeast corner.
	33	0.00		978	" "
	32	0.00		985	" "
	32	40.00		983	Water, floating bog at $\frac{1}{4}$ post.
	31	0.00		988	Ground at northeast corner.
	31	50.00		992	Water, floating bog.
	27	36	0.00		1001
35		0.00		1021	" "
35		60.00		1044	" highest elevation on line.
34		0.00		1028	" northeast corner.
33		0.00		1024	" "
33		75.00		1021	Pond.
32		0.00		1024	Ground at northeast corner.
32		40.00		1027	" $\frac{1}{4}$ post.
31		0.00		1017	" northeast corner.
31		40.00		994	" $\frac{1}{4}$ post.
31		49.59		981	Creek, 2 ft. wide, 1 ft. deep, flowing north.
28	36	0.00		954	Ground at northeast corner.
	35	0.00		924	" "
	34	0.00		919	Swamp water at northeast corner.
	33	0.00		920	Ground at northeast corner.
	33	5.86		922	Canadian Northern railway, two miles north of Whithorn, top of rail.
	32	0.00		925	Ground at northeast corner.
	31	0.00		919	" "
	31	20.00		927	" "
29	36	0.00		897	" northeast corner.
	35	0.00		894	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

FOURTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 52.

MAP 321

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
29	34	0.00	886	Ground at northeast corner.
	33	0.00	879	" "
	33	20.00	877	Water, floating bog.
	33	62.89	873	Creek, 20 ft. wide, flowing north.
	32	0.00	876	Ground at northeast corner.
	31	0.00	874	" "
	31	72.00	870	Small creek, flowing north.
30	36	0.00	869	Ground at northeast corner.
	35	0.00	859	Pasquia river, water in old channel.
	35	10.00	861	Ground at witness mound.
	35	40.00	858	Swamp water at 1/4 post.
	34	0.00	869	Ground at northeast corner.
	33	0.00	870	" "
	32	0.00	869	" "
	31	0.00	869	" "
	31	66.70	859	Waskwei river flowing northeast.
31	36	0.00	866	Ground at northeast corner.
	35	0.00	868	" "
	34	0.00	869	" "
	34	70.80	863	Creek.
	33	0.00	868	Ground at northeast corner.
	33	40.00	867	" 1/4 post.
	33	46.25	863	Waskwei river flowing southeast.
	33	61.22	863	Creek.
	32	0.00	868	Ground at northeast corner.
	31	0.00	879	" "
	31	0.00	878	" second meridian.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## FIFTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 50.

MAP 321

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
1	36	0.00	760	Ground at principal meridian.
	36	56.00	791	" Summit.
	35	21.00	752	"
	34	40.00	767	" at 1/4 post.
	33	58.50	757	Small lake.
	31	0.00	756	Ground at northeast corner.
2	36	0.00	753	" "
	35	0.00	751	" "
	34	0.00	748	" "
	33	0.00	750	" "
	32	26.00	746	"
	32	47.00	725	Creek flowing north.
	31	0.00	726	Ground at northeast corner.
	31	30.00	741	"
3	36	40.00	732	" at 1/4 post.
	36	46.00	750	"
	35	40.00	723	" at 1/4 post.
	34	10.30	715	Gunisao river, east branch.
	34	40.00	735	Ground at 1/4 post.
	33	28.21	715	Gunisao river, west branch.
	32	0.00	719	Ground at northeast corner.
	32	36.60	730	"
	31	0.00	720	" at northeast corner.
	4	36	0.00	723
36		29.50	734	"
36		69.86	719	Playgreen lake, east side, high water mark.
			715	Playgreen lake. July
(Ranges 5 to 20 not yet surveyed.)				
21	35	30.00	837	Moose lake.
	35	32.00	846	Ground on promontory.
	35	43.00	879	" "
	34	0.00	869	" at northeast corner.
	34	10.00	839	Creek flowing northeasterly to Moose lake.
	33	8.00	841	Ground.
21	33	70.00	837	Moose lake, east side of bay.
	22	36	5.00	837

LEVELLING OPERATIONS

95

ELEVATIONS OF NATURAL FEATURES.  
FIFTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

MAP 321

NORTH BOUNDARY OF TOWNSHIP 36.

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
22	36	40.00		843	Ground at $\frac{1}{4}$ post.
	35	0.00		845	" northeast corner.
	34	2.00		843	"
	33	35.00		840	River flowing northeasterly to Moose lake.
	32	6.00		844	Ground.
23	36	0.00		845	" at northeast corner.
	34	10.00		846	"
	32	0.00		846	" at northeast corner.
	31	8.00		847	"
24	36	0.00		875	" at northeast corner. Summit.
	35	0.00		849	" "
	35	15.00		841	Creek flowing northerly.
	33	0.00		849	Ground at northeast corner.
	32	68.00		847	Creek flowing southerly to Saskatchewan river.
25	36	0.00		851	Ground at northeast corner.
	34	0.00		852	" "
	33	27.00		848	Creek flowing southerly to Saskatchewan river.
	32	0.00		854	Ground at northeast corner.
26	36	0.00		854	" "
	35	0.00		859	" "
	35	35.00		877	"
	35	23.00		892	Crossing of Hudson Bay Railway survey line.
	34	21.00		899	Ground.
	33	1.00		913	"
	32	5.00		922	"
	31	17.50		937	" Summit.
	31	38.00		885	"
	31	50.00		861	"
	31	55.00		851	Reader lake, east side.
	27	33	45.00		851
33		54.00		863	Ground on ridge of land.
33		67.00		842	Saskatchewan river. January.
33		78.50		863	Ground on ridge of land.
32		27.00		852	Saskeram lake, east side.
31		48.40		877	Ground, highest point on island.
29	35	40.00		852	Saskeram lake, west side.
	34	0.00		858	Ground at northeast corner.
	32	5.00		864	"
	32	50.00		849	Saskatchewan river flowing north.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## FIFTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 51.

MAP 321

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
29	31	Chs. Lks. 0.00	Fect. 865	Ground at northeast corner. Saskatchewan river flowing south.
	31	50.00	849	
30	36	0.00	870	Ground at northeast corner. Saskatchewan river flowing north. Ground at northeast corner. Top of north bank of Saskatchewan river at a northerly bend. Ground at northeast corner. " " " "
	36	55.00	849	
	35	0.00	865	
	34	6.00	874	
	33	0.00	866	
	31	0.00	870	
	31	25.00	864	
31	36	60.00	885	" " " at northeast corner. " " " at second meridian.
	35	0.00	877	
	34	0.00	876	
	33	40.80	874	



Athabaska river.

Photo by F. V. SEIBERT, D.L.S.



Moving camp, Birch river, 26th base line west of Fourth meridian.

Photo by F. V. SEIBERT, D.L.S.

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LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.  
SIXTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

MAP 372

NORTH BOUNDARY OF TOWNSHIP 60.

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		782	Ground at principal meridian.
	36	46.00		769	Small lake.
	35	3.46		765	Ground.
	34	4.65		755	"
	33	12.48		758	"
	33	40.50		727	Creek.
	33	77.95		728	"
	32	0.00		732	Ground at northeast corner.
	32	32.50		766	"
	31	0.00		722	" at northeast corner.
	31	6.25		712	Creek.
	31	21.50		709	Nelson river (East channel), east side. October.
	2	36	26.70		709
36		27.00		711	Ground at witness mound.
35		0.00		781	" northeast corner.
35		50.80		758	Creek.
34		0.00		777	Ground at northeast corner.
33		0.00		765	" "
32		0.00		757	" "
31		20.00		756	"
31		32.40		754	Orion Lake, east side.
3		36	4.00		758
	35	0.00		784	" northeast corner.
	35	62.50		762	Creek.
	34	0.00		756	Ground at northeast corner.
	34	38.00		745	Creek.
	33	0.00		745	Ground at northeast corner.
	32	0.00		731	" "
	31	0.00		725	" "
	31	66.00		726	" witness mound.
	31	69.20		719	Playgreen lake (West channel), highwater mark on east side.
				712	Playgreen lake, November.
5	34	76.80		712	" " west side.
	33	0.00		724	Ground at northeast corner.
	33	67.00		737	"
	31	40.00		721	" at $\frac{1}{4}$ post.

## ELEVATIONS OF NATURAL FEATURES.

## SIXTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 60.

MAP 372

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.	
		Chs.	Lks.			
6	36	0.00		728	Ground at northeast corner. Kiskittogisu lake, east side, December.	
	36	43.80		711		
7	36	75.00		711	" " west side.	
	35	0.00		726	Ground at northeast corner.	
	35		19.80		732	" "
					711	Bay of Kiskittogisu lake.
	34	5.00		717	Ground at witness mound.	
	33	0.00		716	" northeast corner.	
	32	0.00		716	" "	
	31	0.00		711	" "	
8	36	0.00		710	" "	
				698	Kiskitto lake, east side.	
9	34	60.00		698	" west side.	
	33	0.00		704	Ground at northeast corner.	
	32	0.00		710	" "	
	31	0.00		717	" "	
10	36	0.00		731	" "	
	35	0.00		732	" "	
	35	20.20		722	Creek flowing northeast.	
	35	78.50		727	Creek.	
	34	0.00		730	Ground at northeast corner.	
	34	4.15		731	Creek.	
	33	0.00		745	Ground at northeast corner.	
	32		0.00		742	" "
					715	Lake Hill, four miles north of line, estimated.
	31	0.00		744	Ground at northeast corner.	
11	36	0.00		746	" "	
	35	0.00		757	" "	
	34	0.00		758	" "	
	33	0.00		758	" "	
	32	0.00		755	" "	
	32	13.00		724	Minago river. January.	
	31	0.00		772	Ground at northeast corner.	
12	36	0.00		778	" "	
	35	0.00		785	" "	
	34	0.00		803	" "	
	33	0.00		799	" "	
	32	0.00		797	" "	
	31	0.00		802	" "	
	31	75.00		807	" witness mound	

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.  
SIXTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

MAP 372

NORTH BOUNDARY OF TOWNSHIP 60.

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
13	35	20.00		811	Ground.
	34	0.00		818	" at northeast corner.
	33	0.00		822	" "
	32	0.00		827	" "
	31	0.00		833	" "
14	36	0.00		839	" "
	35	0.00		844	" "
	34	0.00		858	" "
	33	0.00		887	" "
	32	0.00		888	" "
	31	0.00		892	" "
	31	40.00		910	" $\frac{1}{4}$ post.
15	36	0.00		940	" northeast corner.
	35	0.00		927	" "
	34	0.00		912	" "
	33	0.00		900	Swamp water at northeast corner.
	33	8.00		900	Lake, east side.
	31	4.50		900	" west "
	31	10.00		902	Ground at witness mound.
16	36	0.00		911	" northeast corner.
	35	0.00		923	" "
	34	0.00		922	" "
	34	39.00		907	Creek.
	33	0.00		923	Ground at northeast corner.
	32	0.00		904	" "
	32	76.60		950	Ground.
	31	40.00		902	" at $\frac{1}{4}$ post. Summit.
17	36	0.00		882	" northeast corner.
	36	42.70		866	Creek flowing south.
	35	0.00		873	Ground at northeast corner.
	34	0.00		896	" "
	34	40.00		927	" $\frac{1}{4}$ post.
	33	0.00		908	" northeast corner.
	32	0.00		899	" "
	31	0.00		903	" "
18	36	0.00		908	" "
	35	0.00		902	" "
	34	0.00		903	" "
	33	0.00		901	" "
	32	0.00		906	" "
	31	0.00		890	" "
	31	32.50		839	Moose lake, (Limestone bay) east side.

## ELEVATIONS OF NATURAL FEATURES.

## SIXTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 60.

MAP 371

Rgc.	Sec.	Distance from NE. Corner.	Elev.	Feature.
19	35	Chs. Lks. 14.00	Feet. 839	Moose lake, (Limestone bay) west side.
	34	0.00	899	Ground at northeast corner.
	33	0.00	907	" "
	32	0.00	907	" "
	31	0.00	83	" "
20	36	0.00	868	" "
	36	36.00	840	Creek flowing south.
	35	0.00	861	Ground at northeast corner.
	34	0.00	891	" "
	34	77.10	929	" Summit.
	33	0.00	926	" at northeast corner.
	32	0.00	876	" "
31	0.00	868	" "	
21	36	0.00	862	" "
	36	76.60	844	Pickereel creek.
	35	0.00	852	Ground at northeast corner.
	34	0.00	864	" "
	33	0.00	867	" "
21	33	40.40	841	Little Cormorant lake, east side of bay.
	32	38.00	841	" west "
	32	62.00	852	Hudson Bay Railway survey line, about 43 miles from Pas.
	31	0.00	852	Ground at northeast corner on land near Narrows.
22	36	0.00	866	Ground at northeast corner on land near Narrows.
	36	42.00	841	Cormorant lake, east side.
24	32	31.00	841	" west "
	32	60.00	896	Ground.
	31	0.00	867	" at northeast corner in ravine.
	31	8.00	893	"
	31	0.00	928	" at 1/4 post.
25	36	0.00	920	" northeast corner.
	35	0.00	918	" "
	34	0.00	927	" "
	33	0.00	907	" "
	32	0.00	922	" "
	32	40.00	934	" 1/4 post.
	31	0.00	955	" northeast corner.
	31	60.00	986	"

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

SIXTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 60.

MAP 371

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
26	36	0.00	1006	Ground at northeast corner.
	36	56.40	1034	" highest elevation on line.
	35	0.00	1003	" at northeast corner.
	34	0.00	1001	" "
	34	40.00	969	" $\frac{1}{4}$ post.
	33	0.00	953	" northeast corner.
	32	0.00	949	" "
	31	0.00	950	" "
27	36	0.00	966	" "
	35	0.00	950	" "
	35	47.00	921	" "
	34	0.00	911	" at northeast corner.
	33	0.00	915	" "
	33	60.00	914	Ground
	32	0.00	887	" at northeast corner.
	32	5.30	877	Atik lake, east side.
28	36	39.50	877	" west "
	36	41.80	885	Ground.
	36	65.30	946	"
	35	0.00	948	" at northeast corner.
	35	16.90	953	"
	35	27.50	933	" in valley.
	34	0.00	951	" at northeast corner.
	33	0.00	965	" "
	33	16.00	942	Pond.
	32	0.00	950	Ground at northeast corner.
29	31	0.00	951	" "
	36	0.00	948	" "
	36	40.00	938	Marsh on lake shore.
	36	60.60	957	Ground.
	36	65.60	938	Chocolate lake, east side.
	35	6.90	938	" west "
	35	40.00	944	Ground at $\frac{1}{4}$ post.
	35	45.80	954	"
	35	62.00	941	Small lake.
	34	0.00	949	Ground at northeast corner.
	34	9.00	938	Chocolate lake, small bay.
	34	25.00	944	Ground on ridge.
	33	0.00	936	" at northeast corner.
	33	40.00	944	" $\frac{1}{4}$ post.
	32	0.00	935	" northeast corner.
32	28.00	872	Nomev lake, east side.	
31	35	78.00	872	Second meridian (Nomev lake).

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## SEVENTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 61.

MAP 372

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
1	36	0.00	737	Ground at principal meridian.
	36	67.00	750	"
	35	0.00	736	" at northeast corner.
	35	26.10	728	Clarke lake, east side.
	35	71.60	730	Ground.
	35	78.10	728	Keeper lake, east side.
	34	59.20	728	" west "
	33	4.00	732	Ground.
	33	29.40	742	"
	32	23.70	726	"
	32	63.50	742	"
	31	4.00	716	Water in swamp.
2	36	15.00	715	Ground.
	35	4.00	708	"
	34	5.00	714	"
	33	24.00	709	Water in swamp.
	32	15.00	713	Ground.
	31	4.00	716	"
3	36	18.70	704	"
	36	37.20	726	"
	36	55.19	683	Cross lake, east side, lowest elevation on this line.
			685	Cross lake, high water mark.
5	36	75.00	683	" west side.
	35	20.00	695	Ground.
	34	0.00	710	Ground at northeast corner.
	34	40.00	688	" $\frac{1}{4}$ post.
	33	0.00	702	" northeast corner.
	33	40.00	704	" $\frac{1}{4}$ post.
	32	0.00	718	" northeast corner.
	31	4.00	771	" Summit.
6	36	0.00	707	Ground at northeast corner.
	35	0.00	712	" "
	33	0.00	705	" "
	32	0.00	700	" "
	31	0.00	699	" "
7	36	0.00	699	Ground at northeast corner.
	35	12.00	793	" witness mound.
	34	0.00	710	" northeast corner.
	33	0.00	709	" "
	32	40.00	709	Floating bogland.
	31	7.00	711	Ground.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES

SEVENTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 64

MAP 372

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks.	Fect.	
8	36	0.00	714	Ground at northeast corner.
	35	4.20	688	Creek flowing north.
	34	0.00	713	Ground at northeast corner.
	33	0.00	719	" "
	32	0.00	719	" "
	32	40.00	736	" 1/4 post.
	31	0.00	731	" northeast corner.
9	36	0.00	732	" "
	35	0.00	729	" "
	35	61.15	720	Creek flowing north.
	35	64.40	716	Paxon lake, east side. July
	34	10.70	724	Ground.
	34	12.60	715	Lily lake, expansion of Muligan river.
	33	5.80	721	Ground.
	33	53.40	729	Ground.
	32	43.96	716	Muningwari river.
	31	0.00	727	Ground at northeast corner.
	31	63.75	717	Muningwari river.
	31	68.80	723	Ground.
	31	69.00	717	Muningwari, lake east side.
10	35	23.00	717	" west side.
	35	24.50	722	Ground.
	35	60.00	778	"
	34	28.00	767	Small lake.
	33	0.00	772	Ground at northeast corner.
	32	0.00	768	" "
	31	0.00	775	" "
11	36	40.00	773	Floating bogland.
	35	0.00	776	Ground at northeast corner.
	34	20.00	786	Floating bogland.
	33	4.10	798	Ground.
	32	0.00	808	Ground at northeast corner.
	31	0.00	832	" "
12	36	17.00	849	" witness mound.
	35	0.00	862	" northeast corner.
	35	74.40	880	" Summit
	34	40.00	869	" at 1/4 post.
	33	0.00	863	Ground at northeast corner.
	32	0.00	857	" "
	31	0.00	855	" "
13	36	0.00	852	" "
	35	0.00	850	" "



LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

SEVENTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 64.

MAP 371

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
18	32	0.00	929	Ground at northeast corner.
	31	0.00	940	" "
19	36	0.00	930	" "
	35	0.00	942	" "
	34	0.00	946	" "
	33	0.00	943	" "
	32	0.00	947	" "
	31	56.50	975	Highest elevation on this line.
20	36	0.00	947	Ground at northeast corner.
	36	40.00	918	" $\frac{1}{4}$ post.
	36	42.70	915	Reed lake, east side.      October.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES

## EIGHTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 68.

MAP 423

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		657	Small lake at northeast corner.
	36	40.00		677	Ground at $\frac{1}{4}$ post.
	35	20.50		699	"
	34	36.75		648	"Goose" lake, east side.
	34	57.30		659	Ground on island.
	33	34.00		649	" at witness mound on point of land.
	32	15.53		648	"Goose" lake, west side.
	31	0.00		651	Ground at northeast corner.
	2	36	0.00		667
36		44.50		685	"
36		75.80		620	Creek in ravine 62 ft. deep.
35		5.20		679	Ground.
34		0.00		655	" at northeast corner.
34		69.68		649	Lake, east side.
32		0.00		675	Ground at northeast corner.
31		6.00		648	" witness mound.
31		20.20		632	Creek flowing north.
3	36	0.00		634	Ground at northeast corner.
	36	40.00		650	" $\frac{1}{4}$ post.
	35	0.00		644	" at northeast corner.
	35	14.35		604	Bay of Sipiwesk lake, east side. July.
	35	70.00		622	Ground.
	33	45.40		654	" on point of land.
	32	13.41		604	Sipiwesk lake, west side.
	32	40.00		631	Ground at $\frac{1}{4}$ post.
	31	12.00		659	"
4	36	0.00		619	Ground at northeast corner.
	36	56.30		651	"
	36	64.50		605	Sipiwesk lake (Nelson river) east side.
	35	30.00		605	" " west side.
	35	46.00		624	Creek flowing northeast.
	34	2.00		637	Ground at witness mound, Bear island.
	34	61.30		704	"
	32	0.00		672	" at northeast corner.
	31	19.80		765	"
5	36	0.00		732	" at northeast corner.
	35	0.00		642	"
	35	35.40		607	Nelson river, east side.
	35	51.82		607	" " west side.
	34	0.00		641	Ground at northeast corner.
	34	67.10		687	"

(Line crosses many bays of Sipiwesk lake in ranges 5 and 6.)

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

EIGHTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 68.

MAP 422

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
5	33	72.20		681	Ground.
	32	40.00		649	" at 1/4 post.
	31	0.00		629	" northeast corner.
	31	15.80		672	"
	31	62.00		620	Ground at witness mound on island.
6	34	33.45		607	" on another island.
	34	70.70		654	" highest point crossing another island.
	33	61.50		604	Sipiwesk lake, west end. August.
	32	0.00		660	Ground at northeast corner.
	32	44.00		625	Creek.
	32	65.10		672	Ground.
	31	3.00		640	Creek.
	31	50.50		668	Ground.
7		0.00		643	" at northeast corner.
	35	18.00		623	Creek flowing north. October.
	34	0.00		661	Ground at northeast corner.
	34	0.00		693	" "
	34	50.47		686	Creek flowing south.
	33	0.00		709	Ground at northeast corner.
	32	0.00		753	" "
	31	0.00		769	" "
			728	Halfway lake, four miles north of line.	
8	36	0.00		752	Ground at northeast corner.
	35	28.20		738	Goose creek. November.
	35	62.00		748	Crossing of Hudson Bay Railway survey line, about 140 miles from Pas.
	34	0.00		749	Ground at northeast corner.
	34	34.90		747	Goose lake, east side.
	33	27.20		781	Ground.
	33	57.68		748	Creek, flowing south to "Goose" lake.
	33	72.00		795	Ground.
	32	40.00		775	" at 1/4 post.
	31	3.00		759	" witness mound.
	31	23.80		740	Setting lake, east side.
	31	36.50		753	Ground on small island.
	9	35	69.24		740
34		0.00		748	Ground at northeast corner.
34		15.36		740	Grass river, east side, flowing north to Setting lake.
34		72.60		769	Ground.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## EIGHTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 68.

MAP 422

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
9	33	Chs. Lks. 40.00	Feet. 762	Ground at $\frac{1}{4}$ post.
	32	0.00	753	" northeast corner.
	31	3.00	757	" witness mound.
10	36	0.00	762	" northeast corner.
	36	71.50	741	Northerly expansion of Pakwa lake.
	35	16.00	757	Ground at witness mound.
	34	0.00	787	" northeast corner.
	33	0.00	785	" "
	32	0.00	740	Kiski lake, 9 miles south of line.
	31	1.00	783	Ground at northeast corner.
	31	62.55	771	" witness mound.
11	36	40.00	791	Creek, flowing north.
	35	24.10	803	Ground at $\frac{1}{4}$ post.
	34	4.00	781	" "
	33	40.00	801	" witness mound.
	32	0.00	803	" $\frac{1}{4}$ post.
	31	0.00	815	Ground at northeast corner.
(Continuous area of swamp through range 12.)				
12	36	0.00	821	Ground at northeast corner.
	35	0.00	828	" "
	34	0.00	833	" "
	33	0.00	835	" "
	32	0.00	835	" "
	31	0.00	833	" "
13	36	0.00	827	" "
	36	46.76	820	Creek flowing south.
	35	0.00	823	Ground at northeast corner.
	35	.1.00	827	Small lake, east side.
	34	40.00	835	Ground at $\frac{1}{4}$ post.
	33	0.00	882	" northeast corner.
	33	41.80	847	Creek, flowing south.
	32	0.00	905	Ground at northeast corner.
	31	0.00	938	" "
31	40.00	877	" $\frac{1}{4}$ post.	
14	36	0.00	842	" northeast corner.
	36	41.00	819	Grass river.
	35	0.00	924	Ground at northeast corner.
	34	0.00	919	" "
	34	52.70	856	Creek flowing north.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.  
EIGHTEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

MAP 422

NORTH BOUNDARY OF TOWNSHIP 68.

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
14	33	62.00		959	Ground.
	32	20.00		921	"
	32	39.20		984	"
	31	0.00		957	" at northeast corner.
	31	40.00		896	" $\frac{1}{4}$ post.
15	36	0.00		936	" northeast corner.
	36	44.00		841	Grass river.
	35	40.00		918	Ground at $\frac{1}{4}$ post.
	34	70.10		978	"
	33	40.00		908	" at $\frac{1}{4}$ post.
	32	5.83		851	Creek.
	31	44.70		953	Ground.
	31	75.00		843	Wekusko brook. Osborne lake, north side of line.
16	36	40.00		890	Ground at $\frac{1}{4}$ post.
	35	27.80		1006	"
	35	60.00		943	"
	34	64.50		1016	" highest point on line.
	33	40.00		1001	" at $\frac{1}{4}$ post.
	32	15.50		922	Small lake, east side.
	32	35.00		935	Ground on island.
	31	44.25		922	Small lake, west side.
	31	60.00		958	Ground.
			842	Wekusko lake, six miles south of line.	
17	36	0.00		953	Ground at northeast corner.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## NINETEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

MAP 423

NORTH BOUNDARY OF TOWNSHIP 72.

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.	
		Chs.	Lks.			
1	36	0.00		631	Landing lake. August. (The line crosses many bays of Landing lake in ranges 1 and 2).	
	35	9.00		635	Ground at witness mound on mainland.	
	34	0.00		953	" northeast corner.	
	34	48.00		667	"	
	33	40.00		664	" at $\frac{1}{4}$ post.	
	32	0.00		655	" northeast corner.	
	32	68.60		688	"	
	31	11.00		646	"	
	31	47.10		685	"	
	2	36	0.00		636	" at northeast corner.
36		40.00		653	" $\frac{1}{4}$ post.	
35		0.00		642	" northeast corner.	
34		4.00		640	" witness mound on point of land.	
34		70.00		632	Ground at witness mound on point of land.	
32		0.86		631	Landing lake, west end.	
32		20.00		689	Ground.	
31		20.00		647	"	
3		36	0.00		643	" at northeast corner.
		36	15.50		610	Maclaren creek.
	36	31.20		643	Ground.	
	35	0.00		621	" at northeast corner.	
	35	20.00		637	Crossing of Hudson Bay Railway survey line, about 179 miles from Pas.	
	35	52.00		663	Ground.	
	34	0.00		651	" at northeast corner.	
	34	30.36		605	Creek flowing north.	
	33	15.50		597	Bay of Wintering lake, lowest elevation on this line.	
	33	33.30		676	Top of rocky shore.	
	32	0.00		613	Ground at northeast corner.	
	32	47.90		674	"	
	31	0.00		655	" at northeast corner.	
31	47.14		598	Creek flowing north.		
4	36	16.70		597	" " to Wintering lake.	
	36	55.00		646	Ground.	
	35	0.00		628	" at northeast corner	
	35	78.40		598	Creek flowing northeast, 16 ft. wide.	
	34	40.00		610	Ground at $\frac{1}{4}$ post.	
	33	3.20		613	Creek.	

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.  
NINETEENTH BASE LINE WEST OF PRINCIPAL MERIDIAN.

MAP 422

NORTH BOUNDARY OF TOWNSHIP 72.

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
4	33	Chs. Lks. 40.00	Feet. 669	Ground at $\frac{1}{4}$ post.
	32	0.00	710	“ northeast corner.
	31	0.00	730	“ “
	31	53.25	710	Creek, flowing north.
5	36	3.50	749	Ground.
	35	0.00	727	“ at northeast corner.
	35	65.97	676	Halfway river September.
	34	40.00	718	Ground at $\frac{1}{4}$ post.
	33	8.80	665	Creek.
	33	31.29	745	Ground.
	32	0.00	692	“ at northeast corner.
	32	30.75	623	Mispun creek, 16 ft. w., 6 in. deep.
	31	0.00	714	Ground at northeast corner.
	31	19.90	632	Bay off Grass river, east side
6	36	0.00	699	Ground at northeast corner.
	36	14.70	639	Another bay off Grass river, east side.
	36	40.00	688	Ground at $\frac{1}{4}$ post.
	35	0.00	706	“ northeast corner.
	35	12.45	689	Creek.
	34	24.99	795	Ground.
	33	1.00	757	“ at witness mound.
	33	75.85	754	Creek flowing south.
	32	20.00	801	Ground.
	32	55.50	758	Creek.
	31	0.00	771	Ground at northeast corner.
7	36	0.00	759	“ “
	36	35.30	737	Creek.
	35	0.00	825	Ground at northeast corner. Highest point on this line.

## ELEVATIONS OF NATURAL FEATURES.

## TWENTIETH BASE LINE EAST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 76.

(RUNNING EAST.)

MAP 473

Rge.	Sec.	Distance from NW. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	31			644	Ground at principal meridian.
	31	41.06		605	Creek flowing south.
	31	49.00		628	Ground.
	31	56.30		597	Partridge Crop lake, west side.
	33	79.10		597	“ “ east side.
	33	80.00		603	Ground at northeast corner.
	34	38.70		638	“ “
	34	80.00		621	“ “
	36	9.00		619	“ witness mound.
	36	65.00		628	Highest point of island in lake.
2	31	80.00		636	Ground at northeast corner.
	32	80.00		647	“ “
	33	80.00		644	“ “
	34	65.00		604	“ witness mound.
	34	66.20		596	Small lake.
	35	54.50		621	Ground.
	35	80.00		631	Ground at northeast corner.
	36	80.00		685	“ “
3	31	80.00		664	“ “
	32	80.00		664	“ “
	33	80.00		701	“ “
	34	34.40		671	Crossing of Hudson Bay Railway survey line, about 218 miles from Pas.
	34	80.00		678	Ground at northeast corner.
	35	80.00		698	“ “
	36	80.00		703	“ “
4	31	80.00		669	“ “
	32	80.00		696	“ “
	33	80.00		652	“ “
	34	80.00		678	“ “
	35	80.00		684	“ “
	36	22.50		680	Small lake.
	36	80.00		687	Ground at northeast corner.
5	31	40.00		649	“ 1/4 post (flooded).
	32	1.00		650	“ witness mound.
	32	80.00		680	“ northeast corner.
	33	80.00		675	“ “
	34	80.00		650	“ “
	35	58.20		598	Nelson river, west side.
	35	78.80		598	“ “ east side.
	36	30.40		684	Ground.
	36	80.00		688	“ at northeast corner.

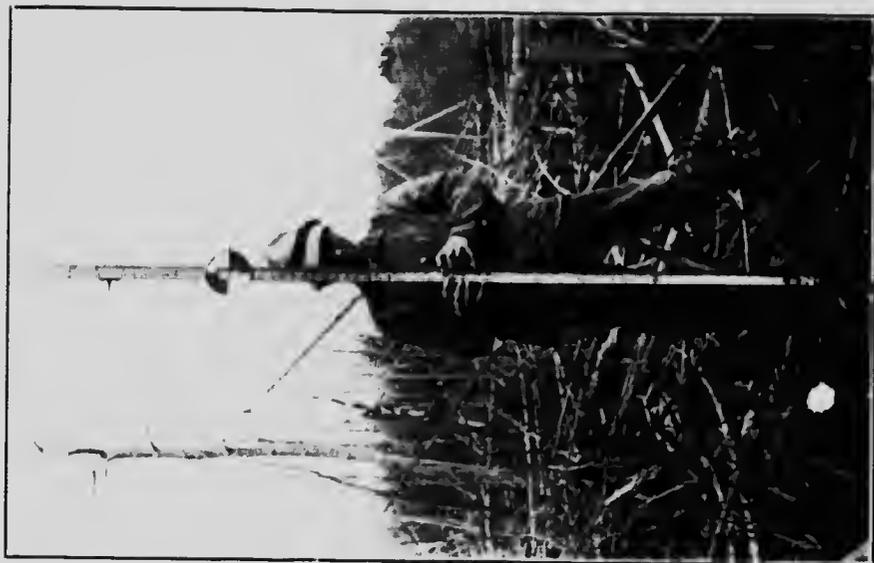
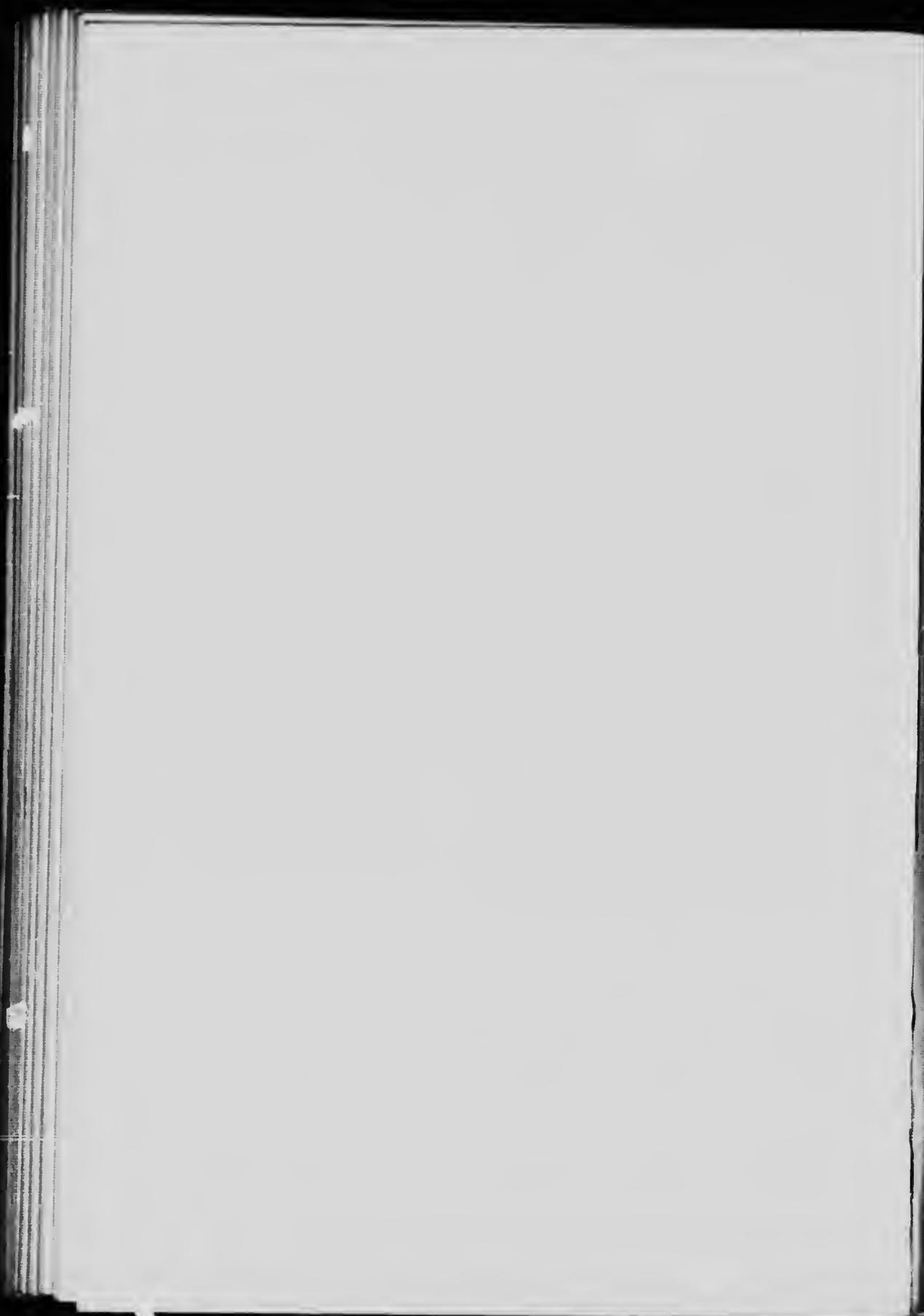


Photo by J. A. Fierman, D.L.S.



Leveling 25th base line range 21, west of Fifth meridian.



LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.  
 TWENTIETH BASE LINE EAST OF PRINCIPAL MERIDIAN.  
 NORTH BOUNDARY OF TOWNSHIP 76.  
 (RUNNING EAST.)

MAP 473

Rz.	Sec.	Distance from NW. Corner.	Elev.	Feature
6		Chs. Lks.	Feet.	
	31	60.00	696	Ground.
	31	80.00	684	" at northeast corner.
	32	80.00	681	" "
	33	80.00	691	" "
	34	80.00	670	" "
	35	80.00	693	" "
	36	80.00	684	" "
7	31	80.00	687	" "
	32	80.00	672	" "
	33	80.00	692	" "
	34	80.00	702	" "
	36	2.00	677	" witness mound.
	36	60.00	659	Ground.

ELEVATIONS OF NATURAL FEATURES  
 TWENTIETH BASE LINE WEST OF PRINCIPAL MERIDIAN.  
 NORTH BOUNDARY OF TOWNSHIP 76.

MAP 473

Rge.	Sec.	Distance from N.E. Corner.	Elev.	Feature.
		Chs. Lks.	Feet.	
1	36	0.00	644	Ground at principal meridian.
	36	31.00	597	Grass river, east side.
	36	55.20	597	" west side.
	36	60.00	647	Ground.
	35	0.00	674	" at northeast corner.
	34	0.00	25	" "
	33	0.00	619	" "
	33	40.00	691	" $\frac{1}{2}$ post.
	32	0.00	675	" northeast corner.
	31	0.00	656	" "
2	36	0.00	663	" "
	35	0.00	657	" "
	34	0.00	724	" "
	33	0.00	664	" "
	33	8.00	658	Water in swamp.
	33	52.50	705	Ground.
	33	80.00	635	" at witness mound.
	31	7.00	622	" "
	31	75.00	632	" "
3	36	48.40	748	"
	35	0.00	656	" at northeast corner.
	34	0.00	677	" "
	34	65.80	784	"
	33	0.00	765	" at northeast corner.
	32	0.00	751	" "
	32	80.00	707	" witness mound.
	31	22.00	780	"
4	36	0.00	738	" northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

TWENTY-FIRST BASE LINE EAST OF PRINCIPAL MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 80.  
(RUNNING EAST.)

MAP 473

Rge.	Sec.	Distance from NW. Corner.		Elev.	Feature.
		Chs.	Lks.		
1				691	Ground at principal meridian.
	31	80.00		678	" at northeast corner.
	32	47.70		709	"
	32	80.00		647	" at northeast corner.
	33	80.00		669	"
	34	80.00		623	"
	35	15.00		615	Odei river.
	35	20.00		625	Ground.
	35	80.00		696	" at northeast corner.
	36	60.00		736	"
2	31	13.07		553	Odei river, west side.
	31	40.22		553	" east side.
	32	20.00		719	Ground.
	32	80.00		701	" at northeast corner.
	33	80.00		638	"
	34	5.30		605	Creek running south.
	34	40.00		607	Ground.
	34	43.60		603	Burntwood river, west side.
	34	51.81		603	" east side.
	34	80.00		634	Ground at northeast corner.
	35	5.30		613	Creek.
	35	80.00		678	Ground at northeast corner.
	36	80.00		641	"
3	31	59.20		571	Burntwood river, west side.
	32	1.80		571	" east side.
	32	6.00		601	Ground at witness mound.
	32	57.00		644	"
	32	67.30		630	Creek running south.
	32	80.00		630	Ground at northeast corner.
	33	80.00		599	"
	34	44.30		571	Burntwood river, west side.
	35	40.00		610	Ground at $\frac{1}{4}$ post.
	36	80.00		687	" northeast corner.
4	31	80.00		702	"
	32	80.00		689	"
	33	80.00		688	"
	34	80.00		616	"
	35	80.00		591	"
	36	40.00		613	" $\frac{1}{4}$ post. (flooded).
	36	61.10		583	Witchai lake, (Grass river) west side.
	36	80.00		600	Ground on point of land.
5	31	33.30		583	Witchai lake, (Grass river) east side.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-FIRST BASE LINE EAST OF PRINCIPAL MERIDIAN

NORTH BOUNDARY OF TOWNSHIP 80.

(RUSNING EA 1)

MAP 473

Rge.	Sec.	Distance from NW. Corner.	Elev.	Feature.
5	31	80.00	619	Ground at northeast corner.
	32	80.00	625	" "
	33	80.00	626	" "
	34	80.00	623	" "
	35	80.00	672	" "
	36	80.00	655	" "
6	31	80.00	624	" "
	32	80.00	614	" "
	33	80.00	620	" "
	34	80.00	625	" "
	35	80.00	651	" "
	36	11.00	610	" "
	36	11.20	583	Nelson river, west side.
	36	36.20	583	" east side.
	36	40.00	630	Ground at $\frac{1}{4}$ post.
7	31	80.00	626	" "
	32	80.00	622	" "
	33	80.00	599	" "
	34	80.00	621	" "
	35	80.00	598	" "
	36	80.00	617	" "
8	31	80.00	660	" "
	32	80.00	684	" "
	33	80.00	694	" "
	34	80.00	683	" "
	35	80.00	700	" "
	36	80.00	680	" "
9	31	80.00	670	Ground at northeast corner.
	32	40.00	666	" $\frac{1}{4}$ post.
	32	80.00	665	" northeast corner.
	33	80.00	650	" "
	34	80.00	656	" "
	35	80.00	650	" "
	36	60.00	645	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

EAST OF RANGE 31, WEST OF PRINCIPAL MERIDIAN.

MAP 21

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	1	0.00		1609	Ground at southeast corner.
	1			1617	" northeast corner.
	12	40.00		1605	" "
	13			1568	Antler creek.
	13			1610	Ground at northeast corner.
	24			1625	" "
36		1597	" "		
2	12			1635	" "
	24			1630	" "
	25			1633	" "
	36			1641	Canadian Pacific railway, between Gainsborough and Carievale stations.
	36			1638 1609	Ground at northeast corner Gainsborough station, Canadian Pacific railway, 2 miles east of line
3	1			1643	Ground at southeast corner.
	1			1649	" northeast corner.
	12			1654	" "
	24			1667	" "
	36			1658	" "
4	12			1692	" "
	13	71.30		1707	" "
	25	40.00		1695	" at $\frac{1}{4}$ post.
	36			1714	" northeast corner.
5	12			1720	" "
	13	40.05		1719	Canadian Pacific railway between Council and Storthoaks stations.
	24			1712	Ground at northeast corner.
	25			1726	" "
	36			1751	" "
6	1			1759	" "
	12			1757	" "
	13			1770	" "
	24			1787	" "
	25			1803	" "
	36			1819	" "
36			1778	Gainsborough creek, 60 chs. west of northeast corner.	
7	1			1807	Ground at southeast corner.
	1			1821	" northeast corner.
	12			1856	" "
	13			1839	" "

## ELEVATIONS OF NATURAL FEATURES.

## EAST OF RANGE 31, WEST OF PRINCIPAL MERIDIAN.

MAPS 21, 71

Tp.	Sec.	Distance from SE. Corner.	Elev.	Feature.	
7	13	Chs. Lks. 39.12	Feet 1846	Canadian Pacific Railway, between Antler and Frys stations.	
	24	43.00	1825	Gainsborough creek (branch).	
	24		1859	Ground at northeast corner.	
	25		1868	" "	
	36		1870	" "	
8	1	40.00	1850	Gainsborough creek.	
	1		1875	Ground at northeast corner.	
	12		1856	" "	
	13		1856	Gainsborough creek.	
	13		1863	Ground at northeast corner.	
	24		1870	" "	
	25		1872	" "	
	36		1879	" "	
9	1		1885	" "	
	12		1890	" "	
	13		1898	" "	
	24		1899	" "	
	25		1892	" "	
	36		1896	" "	
10	12	23.52	1914	" "	
	13		1909	Canadian Northern railway, between Maryfield and Rycerson stations.	
			1902	Maryfield station, Canadian Pacific railway, $\frac{3}{4}$ mile east of line.	
			1902	Maryfield station, Canadian Northern railway.	
	24		1.14	1910	Canadian Pacific railway, between Maryfield and Fairlight stations.
	24		36	1908	Ground at northeast corner.
	36			1903	" "
11	1		1924	" southeast corner.	
	12		1925	" northeast corner.	
	13		1903	" "	
	24		1902	" "	
	25		1893	" "	
	36		1897	" "	
12	1	60.00	1896	"	
	1	8.23	1771	" at northeast corner.	
	12		1718	Pipestone creek.	
	12	40.00	1826	Ground at $\frac{1}{4}$ post.	
	12	24	1891	" northeast corner.	
	24		1880	" "	

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

EAST OF RANGE 31, WEST OF PRINCIPAL MERIDIAN.

MAPS 71, 121

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
12	36			1877	Ground at northeast corner.
13	12	40.00		1876	" $\frac{1}{4}$ post.
	12			1847	" northeast corner.
	13	35.00		1841	Water in large slough.
	13	79.16		1844	Canadian Pacific railway between Flem- ing and Moosomin stations.
	24			1822	Ground at northeast corner.
	25			1790	" "
	36			1775	" "
14	12			1755	" "
	24			1732	" "
	36			1714	" "
15	1			1741	" southeast corner.
	12			1718	" northeast corner.
	24			1714	" "
	36			1701	" "
16	12	3.11		1697	Canadian Pacific railway, between Welwyn and Rocanville stations.
	12			1688	Ground at northeast corner.
	24			1690	" "
	36	60.00		1651	" "
17	12			1623	" northeast corner.
	24			1600	" "
	36	60.00		1594	" "
18	1	20.00		1321	"
	1	44.89		1307	Qu'Appelle river.
	1			1345	Ground at northeast corner.
	12	20.00		1577	"
	12			1605	" at northeast corner.
	24	44.35		1601	Grand Trunk Pacific railway, between Welby and Spyhill stations.
	24			1597	Ground northeast corner.
36			1591	" "	
19	1			1608	" southeast corner.
				1620	Spyhill station, Grand Trunk Pacific railway, $1\frac{1}{2}$ miles west of line.
	12			1615	Ground at northeast corner.
	13	40.92		1601	Deerhorn creek, flowing southeast to Assiniboine river.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## EAS. OF RANGE 31, WEST OF PRINCIPAL MERIDIAN.

MAP 121

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
19	24			1639	Ground at northeast corner. (Many sloughs in townships 19 to 24, elevation 1 to 5 ft. below surrounding lands.)
	36			1653	Ground at northeast corner.
20	12			1659	" "
	24			1673	" "
	36			1671	" "
21	12			1668	" "
	24			1671	" "
				1683	Langenburg station, Canadian Pacific railway, 2 $\frac{1}{4}$ miles west of line.
	36			1670	Ground at northeast corner.
22	1	25.32		1655	Smith creek, flowing southeast to Assini- boine river.
	12			1678	Ground at northeast corner (slough).
	24			1687	" "
	36			1696	" "
23	1			1704	" southeast corner.
	12			1709	" northeast corner.
	24			1707	" "
	36			1706	" "
24	12	60.00		1706	Ground.
	24			1695	Ground at northeast corner.
	36	53.02		1709	Canadian Northern railway, between MacNutt and Calder stations.
	33			1706	Ground at northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

SECOND MERIDIAN.

M.S.P. 320, 371

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
56	24	80.00	870	Ground at northeast corner.	
	25	29.00	875	"	
	25	40.00	855	Saskatchewan river.	
	25	50.30	875	Ground.	
	25	78.00	872	" at witness mound.	
			857	Tearing river.	
	36	40.00	871	Ground at $\frac{1}{4}$ post.	
	36	80.00	875	" northeast corner.	
57	1	54.00	887	"	
			876	Belanger lake.	
	24	28.00	883	Ground.	
	24	40.00	900	" at $\frac{1}{4}$ post.	
	25	80.00	908	" northeast corner.	
	36	80.00	924	"	
58	1	32.00	936	"	
	1	77.00	929	"	
	12	76.00	893	"	
	13	80.00	894	" at northeast corner	
	24	38.00	886	"	
	25	6.00	883	"	
	25	80.00	890	" at northeast corner.	
	36	80.00	924	"	
				"	
59	1	50.00	933	"	
	1	79.00	913	"	
	12	45.50	881	"	
			873	Namew lake, English Narrows.	
	24	36.50	884	Ground.	
	24	80.00	920	" at northeast corner.	
	25	70.00	876	"	
			873	Namew lake.	
60	13	62.20	878	Ground.	
	24	3.00	894	"	
			873	Namew lake.	
	25	1.00	881	Ground.	
	25	42.00	893	Swamp.	
	36	17.00	876	Ground.	
			873	Namew lake, north side.	
61	24	17.00	884	Ground.	
	24	80.00	959	" at northeast corner.	
	25	78.00	975	"	
	36	80.00	980	" at northeast corner.	
				"	

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## SECOND MERIDIAN.

MAPS 371, (420)

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
62	1	80.00		965	Ground at northeast corner.
	12	80.00		937	" "
	13	9.10		928	Sturgeon-weir river, south side.
	13	17.80		928	" north side.
	13	20.00		936	Ground.
	24	80.00		956	" at northeast corner.
	25	80.00		963	" "
	36	80.00		963	" "
63	1	40.00		964	" $\frac{1}{4}$ post.
	1	80.00		1002	" at northeast corner.
	12	80.00		1011	" "
	13	32.60		979	Maraiche lake, south side.
	36	37.10		979	" north side.
	36	80.00		1002	Ground at northeast corner.
64	1	80.00		1032	" "
	12	80.00		1050	" "
	13	80.00		1063	" "
	24	80.00		1079	" "
	25	10.00		1086	" Summit.
	25	71.28		1014	Sawap Lake.
	36	80.00		1018	Ground at northeast corner.
65	1	33.00		1003	Creek.
	1	48.00		1002	"
	12	0.92		1002	River.
	12	67.00		1060	Ground.
	12	76.80		1006	Lake.
	13	55.00		1030	Ground.
	13	80.00		1016	Ground at northeast corner.
	24	80.00		1057	" "
	25	31.75		1040	Echo lake.
	25	80.00		1052	Ground at northeast corner.
	36	80.00		1061	" "
66	1	40.00		1079	" $\frac{1}{4}$ post.
	1	73.71		1031	Lake.
	12	37.80		1031	Creek.
	12	40.00		1037	Ground at $\frac{1}{4}$ post.
	12	56.35		1031	Lake.
	12	80.00		1063	Ground at northeast corner.
	13	60.00		1098	"
	13	78.10		1095	Creek.
	13	80.00		1081	Ground at northeast corner.
	24	60.00		1103	"
	24	80.00		1089	" at northeast corner.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

SECOND MERIDIAN.

MAP (420)

Tp.	Sec.	Distance from SE. Corner.	Elev.	Feature.
66		Chs. Lks.	Feet.	
	25	11.08	1073	Lake.
	25	40.00	1105	Ground at $\frac{1}{4}$ post.
	25	80.00	1107	" northeast corner.
	36	4.58	1084	Creek.
	36	40.00	1125	Ground at $\frac{1}{4}$ post.
	36	50.40	1056	Lake.
	36	80.00	1127	Ground at northeast corner.
67	1	31.65	1114	Lake.
	1	70.00	1150	Ground.
	1	80.00	1140	" at northeast corner.
	12	30.00	1154	" Summit.
	12	80.00	1143	" at northeast corner.
	13	1.50	1134	Lake, south side.
	24	4.72	1134	Lake, north side.
	24	6.00	1143	Ground, approximate.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## THIRTEENTH BASE LINE WEST OF SECOND MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 48.

MAP 270

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.	
		Chs.	Lks.			
1	36	0.00		1051	Ground at second meridian.	
	35	0.00		1058	" northeast corner.	
	34	0.00		1071	" "	
	34	20.00		1069	Pasquia river, flowing northeast.	
	33	0.00		1080	Ground at northeast corner.	
	33	20.00		1092	" "	
	33	25.07		1082	Pasquia river, flowing east.	
	32	0.00		1108	Ground at northeast corner.	
	32			1132	Top of rail C. N. Ry., Pas branch, about	
		32	62.01		1/4 mile south of Chemong siding.	
		31	0.00		1167	Creek flowing southeast to Pasquia river.
		31	79.40		1209	Ground at northeast corner. Creek, flowing south.
	2	36	0.00		1210	Ground at northeast corner.
35		0.00		1257	" "	
35		41.25		1300	Creek, flowing southeast to Pasquia river.	
34		0.00		1320	Ground at northeast corner.	
33		0.00		1411	" "	
33		18.45		1425	Creek, flowing south to Pasquia river.	
33		43.86		1553	Ground.	
33		72.89		1647	" "	
33		80.28		1573	Creek, flowing south to Pasquia river.	
32		0.00		1574	Ground at northeast corner.	
32		19.58		1649	Creek, flowing east.	
32		40.00		1750	Ground at 1/4 post.	
32		74.25		1850	" "	
32		76.61		1762	Creek, flowing south to Pasquia river.	
31		0.00		1776	Ground at northeast corner.	
31		43.24		1981	" "	
31	53.35		1938	Pasquia river, flowing southeast.		
31	58.10		1959	" " northeast.		
3	36	0.00		2071	Ground at northeast corner.	
	36	40.00		2213	" 1/4 post.	
	35	0.00		2277	" northeast corner.	
	35	40.00		2337	" 1/4 post.	
	34	0.00		2374	" northeast corner.	
	34	40.00		2456	" 1/4 post.	
	34	69.58		2484	Highest point on this line.	
	33	0.00		2444	Ground at northeast corner.	
	33	32.75		2390	Fir river, flowing southwest.	
	33	63.90		2349	" " north.	
	33	77.00		2326	" " south.	
	32	0.00		2329	Ground at northeast corner.	
	31	0.00		2275	" "	
	31	31.50		2207	Fir river, flowing north.	

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

THIRTEENTH BASE LINE WEST OF SECOND MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 48

MAP 270

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
4	36	Chs. Lks. 0.00	2184	Ground at northeast corner.
	36	56.35	2114	Creek.
	35	0.00	2103	Ground at northeast corner.
	35	4.00	2100	Fir river, flowing south.
	34	0.00	2087	Ground at northeast corner.
	34	5.05	2082	Creek flowing south to Fir river.
	34	40.00	2101	Ground at $\frac{1}{4}$ post.
	33	0.00	2047	" northeast corner.
	33	79.00	2012	Fir river, flowing northwest.
	32	0.00	2015	Ground at northeast corner.
	31	0.00	2010	" "
5	36	0.00	2024	" "

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## FIFTEENTH BASE LINE WEST OF SECOND MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 56.

MAP 320

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
1	36	0.00	875	Ground at second meridian.
	35	0.00	874	“ northeast corner.
	34	0.00	896	“ “
	33	0.00	871	“ “
	33	20.00	865	Tearing river.
	32	0.00	867	Ground at northeast corner.
	31	0.00	867	“ “
2	36	0.00	868	“ “
	35	0.00	869	“ “
	35	77.00	872	“ witness mound.
	34	5.00	862	Saskatchewan river.
	33	0.00	871	Ground at northeast corner.
	32	0.00	870	“ “
	31	0.00	..	Lake, east side.
3	33	0.00	871	“ west side.
			868	Cumberland lake, north of line, esti- mated.
	33	40.00	876	Ground at $\frac{1}{4}$ post on narrow ridge between lakes.
	33	65.00	873	Lake, east side.
	31	0.50	873	“ west side.
	31	40.00	873	Ground at $\frac{1}{4}$ post.
	31	46.50	874	Creek.
	31	76.00	874	Ground.
4	36	0.00	875	Creek.
	35	0.00	875	Creek flowing southerly.
	34	0.00	876	Ground at northeast corner.
	34	16.00	876	Small lake.
	33	0.00	876	Ground at northeast corner.
	32	0.00	876	“ “
	32	61.96	876	Creek flowing southerly.
	31	0.00	880	Ground at northeast corner.
5	36	0.00	878	“ “
	35	0.00	879	“ “
	34	0.00	881	“ “
	33	0.00	881	“ “
	33	31.50	881	Creek.
	32	0.00	879	Ground at northeast corner.
	31	0.00	881	“ “
6	36	0.00	882	“ “
	35	0.00	885	“ “
	36	49.00	884	Creek.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

FIFTEENTH BASE LINE WEST OF SECOND MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 56.

MAP 320

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
6	34	Chs. Lks.	Feet.	
		0.00	886	Ground at northeast corner.
	33	0.00	892	" "
	32	0.00	891	" "
	32	72.00	886	Saskatchewan river (Old channel).
	31	0.00	887	Ground at northeast corner.
7	36	0.00	892	" "
	34	0.00	890	" "
	33	0.00	893	" "
	32	0.00	892	" "
	31	0.00	895	" "
8	36	0.00	894	" "
	36	20.00	891	Saskatchewan river (Present channel) flowing northeasterly.
	35	0.00	901	Ground at northeast corner.
	35	1.60	892	Creek flowing to Torch river.
	35	21.00	892	" "
	35	47.00	895	" "
	34	0.00	902	Ground at northeast corner.
	34	62.00	891	Torch river flowing southeasterly.
	33	0.00	903	Ground at northeast corner.
	32	0.00	913	" "
	32	12.00	891	Torch river.
	32	64.50	924	Top of north bank of Torch river.
	31	0.00	932	Ground at northeast corner.
31	41.50	922	Creek flowing north to Torch river.	
9	36	0.00	938	Ground at northeast corner.
	35	0.00	943	" "
	34	0.00	948	" "
	33	0.00	951	" "
	32	0.00	939	" "
	32	4.00	926	Torch river flowing northeasterly.
	32		942	Creek.
	31	0.00	949	Ground at northeast corner.
				" "
10	36	0.00	964	" "
	36	15.00	960	Creek flowing southeasterly to Torch river.
	35	0.00	985	Ground at northeast corner.
	34	0.00	991	" "
	33	0.00	1002	" "
	32	0.00	1005	" "
	31	0.00	1026	" "
				" "
11	36	0.00	1039	" "

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## FIFTEENTH BASE LINE WEST OF SECOND MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 36.

MAPS 320, 319

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
11	35	0	00	1061	Ground at northeast corner.
	34	0	00	1099	" "
	33	0	00	1131	" "
	32	0	00	1170	" "
	31	0	00	1168	" "
12	36	0	00	1168	" "
	35	0	00	1166	" "
	34	0	00	1173	" "
	33	0	00	1162	" "
	32	0	00	1166	" "
	31	0	00	1163	" "
	31	7	00	1154	Creek flowing northeast.
13	36	0	00	1173	Ground at northeast corner
	35	0	00	1175	" "
	34	0	00	1178	" "
	33	0	00	1184	" "
	32	0	00	1186	" "
	31	0	00	1188	" "
	31	27	00	1180	Creek flowing southerly.
14	36	0	00	1191	Ground at northeast corner.
	35	0	00	1198	" "
	34	0	00	1208	" "
	33	0	00	1226	" "
	32	0	00	1233	" "
	31	0	00	1244	" "
15	36	0	00	1263	" "
	35	0	00	1273	" "
	34	0	00	1279	" "
	33	0	00	1287	" "
	32	0	00	1307	" "
	31	0	00	1325	" "
16	36	0	00	1349	" "
	35	0	00	1367	" "
	34	0	00	1388	" "
	33	0	00	1400	" "
	32	0	00	1410	" "
	31	0	00	1453	" "
17	36	0	00	1463	" "
	35	0	00	1574	" "
	35	30	00	1492	Small lake.
	34	0	00	1509	Ground at northeast corner.



Witness mound. Established when the corner of a section falls in a lake or other inaccessible place.  
73075—p. 128.

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LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

FIFTEENTH BASE LINE WEST OF SECOND MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 56.

MAP 319

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
17	33	0.00		1496	Ground at northeast corner.
	32	0.00		1514	" "
	31	0.00		1489	" "
	31	35.69		1465	Creek flowing south to Gull creek.
18	36	0.00		1499	Ground at northeast corner.
	35	0.00		1536	" "
					Crossing of preliminary survey line of Hudson Bay Pacific Railway.
	34	0.00		1564	Ground at northeast corner.
	33	0.00		1611	Ground at northeast corner.
	32	0.00		1650	" "
	31	0.00		1619	" "
19	36	0.00		1591	" "
	35	0.00		1647	" "
	34	0.00		1679	" "
	34			1639	White Gull river.
	33	0.00		1726	Ground at northeast corner.
	32	0.00		1701	" "
	31	0.00		1690	" "
20	36	0.00		1702	" "
	35	0.00		1728	" "
	34	0.00		1752	" "
	33	0.00		1773	" "
	32	0.00		1824	" "
	31	0.00		1838	" "
21	36	0.00		1842	Highest elevation on this line.
	34	0.00		1840	" at northeast corner.
	33	0.00		1840	" "
	32	0.00		1825	" "
	31	0.00		1826	" "
22	36	2.00		1809	" witness mound.
	36	79.00		1788	" "
	35	40.00		1777	" 1/4 post.
	34	7.00		1769	" witness mound.
	34	80.10		1750	Creek.
	33	0.00		1752	Ground at northeast corner.
	31	0.00		1717	" "
23	36	0.00		1656	" "
	36	19.15		1618	Candle lake, east side.
	33	3.25		1618	" west side.
	33	40.00		1627	Ground at 1/4 post.
	32	0.00		1640	Ground at northeast corner.
	31	5.00		1635	" witness mound.

## ELEVATIONS OF NATURAL FEATURES.

## FIFTEENTH BASE LINE WEST OF SECOND MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 56.

MAP 319

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.	
23	31	Chs. Lks. 43. 70	Feet. 1624	Hanin river.	
	31	77. 00	1649	Ground at witness mound.	
24	36	40. 00	1682	" 1/4 post.	
	35	0. 00	1696	" northeast corner.	
	34	1. 00	1710	" witness mound.	
	33	0. 00	1741	" northeast corner (flooded).	
	33	40. 00	1782	" 1/4 post.	
	32	0. 00	1755	" northeast corner.	
	32	80. 50	1715	" witness mound.	
25	36	0. 00	1698	" northeast corner.	
	36	78. 00	1699	" witness mound.	
	35	40. 00	1718	" 1/4 post.	
	34	0. 00	1738	" northeast corner.	
	33	4. 00	1759	" witness mound.	
	33	40. 00	1781	" 1/4 post.	
	32	0. 00	1742	" northeast corner.	
	32	40. 00	1727	" 1/4 post.	
	32	72. 00	1691	" witness mound.	
	31	2. 07	1689	Small lake.	
	31	40. 00	1684	Ground at 1/4 post.	
	31	56. 00	1682	McLean creek.	
	26	36	3. 00	1682	Ground at witness mound.
36		19. 00	1671	Small lake, east side.	
36		76. 00	1681	Ground at witness mound.	
36		76. 10	1672	Bittern lake, east side.	
34		12. 23	1672	" west side.	
			1609	Montreal lake, nine miles north of line, water, (September).	
			1634	Montreal Lake Settlement, northeast corner of Anglican church grounds.	
			1611	Bittern river, water at ford on road to Montreal lake.	
		34	17. 00	1679	Ground at witness mound.
		33	40. 00	1744	" 1/4 post.
		32	0. 00	1783	" northeast corner.
		31	0. 00	1785	" "
27		36	0. 00	1818	" " (flooded).
	35	0. 00	1842	" "	
	34	0. 00	1831	" "	
	34	5. 00	1829	McPhee creek.	
	34	80. 50	1872	Ground.	
	33	40. 00	1868	" at 1/4 post.	
	32	27. 25	1878	" "	
	32	40. 00	1920	" at 1/4 post.	
	32	68. 67	1926	" "	
	31		1880	Small lake at third meridian.	

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

SIXTEENTH BASE LINE WEST OF SECOND MERIDIAN.

MAP (370)

NORTH BOUNDARY OF TOWNSHIP 60.

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
1	36	Chs. Lks. 0.00	Fect. 876	Second meridian (Namew lake), June 18, 1914.
	35	42.20	876	Namew lake, west side.
	35	77.70	901	Ground at witness mound.
	34	20.00	914	"
	34	45.00	928	"
	34	76.70	918	" at witness mound.
	33	11.00	915	Waterfall lake, east side.
	32	46.25	915	" west "
	31	0.		Ground at northeast corner.
	31	20	909	"
2	36	0.00	916	" at northeast corner.
	35	0.00	911	" "
	35	39.85	907	Swamp water at 1/4 post.
	35	76.00	907	O'Leary lake, east side, June 1, 1914.
	33	79.35	907	" west "
	32	3.00	867	Cumberland lake, south of line, estimated.
	32	40.55	907	Ground at witness mound.
	31	0.00	917	Creek.
	31		935	Ground at northeast corner.
3	36	0.00	945	" "
	36	21.20	952	" "
	35	0.00	943	" at northeast corner.
	35	20.00	941	Swamp water.
	34	0.00	943	Ground at northeast corner.
	34	80.00	938	" witness mound.
	33	59.00	933	" "
	32	0.00	930	Swamp water at northeast corner.
	31	0.00	930	" "
4	36	0.00	934	Ground at northeast corner.
	36	73.00	936	" witness mound.
	35	0.00	934	Swamp water.
	34	0.00	931	"
	34	40.00	931	" at 1/4 post.
	34	71.00	934	Ground at witness mound.
	32	0.00	965	" northeast corner.
	31	0.00	943	" "
	31	60.00	942	Swamp water.
	5	36	0.00	951
35		0.00	944	" "
34		0.00	940	" "
34		46.50	923	Grassberry river flowing south to Pine Bluff lake.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## SIXTEENTH BASE LINE WEST OF SECOND MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 60.

MAP (370)

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
5	33	0.00		934	Swamp water at northeast corner.
	33	40.00		934	“ $\frac{1}{4}$ post.
	33	71.00		939	Ground at witness mound.
	31	0.00		943	“ northeast corner.
6	36	0.00		949	“ “
	36	40.00		947	Swamp water at $\frac{1}{4}$ post.
	35	0.00		948	Ground at northeast corner.
	34	0.00		945	“ “
	34	58.36		959	“
	33	0.00		951	“ at northeast corner.
	32	0.00		950	Swamp water at northeast corner.
	31	0.00		959	Ground at northeast corner.
	31	76.10		953	“
7	36	63.60		954	“
	35	40.00		956	Water in bogland.
	34	3.00		958	Ground at witness mound.
	33	2.00		963	“ “
	32	0.00		967	“ northeast corner.
	32	56.30		956	Brougham creek, flowing south to Mossy river.
	31	4.00		967	Ground at witness mound.
8	36	0.00		995	“ northeast corner.
	35	0.00		1001	“ “
	35	40.00		999	Bogland at $\frac{1}{4}$ post.
	35	78.00		1005	Ground at witness mound.
	33	0.00		1028	“ northeast corner.
	33	77.00		1058	“ witness mound.
	32	0.00		1056	Small lake at northeast corner.
	31	0.00		1077	Ground at northeast corner.
	31	66.0'		1096	“ witness mound.
9	36	0.00		1096	“ northeast corner.
	35	0.00		1101	“ “
	35	19.80		1101	Creek flowing northeast.
	35	48.60		1104	Same creek flowing southeast
	34	0.00		1109	Ground at northeast corner.
	33	9.00		1123	“ witness mound.
	32	0.00		1145	Water in bogland.
	32	10.00		1149	Ground at witness mound.
	31	0.00		1153	“ northeast corner.
	31	20.00		1159	Water in bogland.
	31	60.00		1163	“
10	36	0.00		1165	Ground at northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

SIXTEENTH BASE LINE WEST OF SECOND MERIDIAN.

MAP (370)

NORTH BOUNDARY OF TOWNSHIP 60.

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
10	35	0.00		1181	Ground at northeast corner.
	34	0.00		1193	" "
	33	0.00		1206	" "
	32	0.00		1224	" "
	31	0.00		1237	" "
11	36	0.00		1238	" "
	35	0.00		1235	" "
	34	0.00		1234	" "
	33	0.00		1231	" "
	33	60.00		1221	" "
	33	69.60		1213	Mossy river flowing southeast.
	32	0.00		1223	Ground at northeast corner.
	32	78.00		1228	" witness mound.
	31	60.00		1229	Swamp water in hay meadow.
	31	72.00		1225	Mossy river flowing northeast.
12	31	74.00		1230	Ground at witness mound.
	36	0.00		1230	" northeast corner.
	35	0.00		1236	" "
	34	0.00		1239	" "
	34	40.00		1241	Swamp water at 1/4 post.
	33	0.00		1246	Ground at northeast corner.
	33	76.00		1255	Ground at witness mound.
	32	0.00		1254	Swamp water at northeast corner.
	32	77.00		1265	Ground at witness mound.
	31	67.00		1270	" "
13	36	40.00		1268	Swamp water at 1/4 post.
	35	1.00		1269	Ground at witness mound.
	35	77.20		1262	Top of bank of river.
	35	78.00		1255	Mossy river flowing southeast.
	34	3.00		1263	Ground at witness mound.
	33	0.00		1276	" northeast corner.
	33	79.00		1296	" witness mound.
	32	4.00		1295	Swamp water.
	31	0.00		1303	Ground at northeast corner.
	31	40.00		1306	" 1/4 post.
14	36	13.00		1300	" witness mound.
	35	0.00		1296	" northeast corner.
	34	8.00		1295	" witness mound.
	34	40.00		1294	Swamp water at 1/4 post.
	33	0.00		1296	" northeast corner.
	32	0.00		1300	Ground at northeast corner.
	31	2.00		1306	" witness mound.
	31	66.00		1309	" "

## ELEVATIONS OF NATURAL FEATURES.

## SIXTEENTH BASE LINE WEST OF SECOND MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 60.

MAP 109

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
15	36	0.00		1307	Swamp water at north east corner.
	35	0.00		1310	Ground at northeast corner.
	35	11.50		1300	Mossy river, south branch.
	34	0.00		1316	Ground at northeast corner.
	34	40.00		1315	Swamp water at $\frac{1}{4}$ post.
	33	0.00		1316	Ground at northeast corner.
	33	40.00		1316	Swamp at $\frac{1}{4}$ post.
	33	77.00		1319	Ground at witness mound.
	32	61.72		1344	"
	31	0.00		1330	" at northeast corner.
16	36	0.00		1433	" "
	36	52.60		1475	Creek flowing southeast.
	36	60.30		1484	Crossing of Hudson Bay Pacific Railway preliminary survey line.
	35	0.00		1541	Ground at northeast corner.
	34	9.00		1582	" "
	34	46.00		1620	Creek.
	33	0.00		1701	Ground at northeast corner.
	32	0.00		1847	" "
	31	0.00		1977	" "
	17	36	0.00		2104
36		40.00		2073	" $\frac{1}{4}$ post.
35		0.00		2104	" northeast corner.
35		65.00		2084	Creek flowing south.
34		0.00		2105	Ground at northeast corner.
34		31.07		2135	"
33		0.00		2108	" at northeast corner.
32		0.00		2151	" "
32		47.38		2211	"
31		5.00		2126	" at witness mound.
31		11.50		2111	Creek flowing southeast.
31		71.00		2137	Pond draining south.
18	36	0.00		2142	Ground at northeast corner.
	36	27.50		2184	"
	36	40.00		2145	Swamp water at $\frac{1}{4}$ post.
	35	0.00		2155	Ground at northeast corner.
	35	40.00		2121	Swamp water at $\frac{1}{4}$ post.
	35	62.20		2113	Creek.
	34	0.00		2114	Ground at northeast corner.
	33	0.00		2160	" "
	33	40.00		2056	" $\frac{1}{4}$ post.
	32	0.00		2268	" northeast corner.
	32	67.50		2238	" highest elevation on line.
	31	0.00		2214	" at northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

SIXTEENTH BASE LINE WEST OF SECOND MERIDIAN.

MAP (369)

NORTH BOUNDARY OF TOWNSHIP 60.

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.	
		Chs.	Lks.			
19	36	0.00		2140	Lake at northeast corner.	
	36	13.00		2151	Ground at witness mound.	
	36	15.00		2152	Height of land between Saskatchewan and Churchill rivers.	
	35	0.00		2132	Ground at northeast corner.	
	34	0.00		2066	" "	
	33	0.00		2026	" "	
	32	0.00		1944	" "	
	32	23.50		1893	Small lake, east side.	
	31	0.00		1894	Ground at northeast corner.	
	31	30.40		1905	"	
	20	36	0.00		1766	" at northeast corner.
		36	28.06		1630	Creek flowing north to Stuart lake.
36		60.00		1762	Ground.	
35		0.00		1859	" at northeast corner.	
35		40.00		1842	Swamp at 1/4 post.	
34		0.00		1856	Ground at northeast corner.	
33		0.00		1877	" "	
32		0.00		1944	" "	
32		20.00		1904	"	
32		51.65		1960	"	
31		0.00		1922	" at northeast corner.	
31		20.00		1877	"	
31		34.50		1776	Clarence lake, east side.	
31		60.60		1865	Ground.	
31	68.50		1775	Lake, east side.		
21	36	1.00		1781	Ground at witness mound on island.	
	36	19.70		1775	Lake, west side.	
	36	43.20		1895	Ground.	
	36	75.50		1840	Creek.	
	35	0.00		1874	Ground at northeast corner	
	34	4.00		1927	" witness mound.	
	33	0.00		1993	" northeast corner.	
	32	0.00		1981	" "	
	31	0.00		1967	" "	
	31	40.00		1944	" 1/4 post.	
	22	36	0.00		1974	" northeast corner.
36		77.00		1978	" witness mound.	
35		48.00		1952	"	
34		0.00		1947	" at northeast corner.	
33		0.00		1923	" "	
33		30.25		1913	Creek flowing north.	
32		0.00		1931	Ground at northeast corner.	
31		0.00		1936	" "	

## ELEVATIONS OF NATURAL FEATURES.

## SIXTEENTH BASE LINE WEST OF SECOND MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 60.

MAP (369)

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
22	31		25.00	1945	Small lake, east side.
23	36		0.00	1954	Ground at northeast corner.
	35		2.00	1931	" witness mound.
	35		4.65	1929	Small lake, east side, November 1, 1913.
	34		0.00	1856	Ground at northeast corner.
	34		(50.00)	1805	Depression.
	34		77.58	1817	Ground.
	33		0.00	1809	" at northeast corner.
	33		(30.00)	1786	Depression.
	33		40.00	1788	Ground at $\frac{1}{4}$ post.
	33		78.00	1772	" witness mound.
	32		20.00	1767	Surface water.
	31		0.00	1765	Water in hay meadow.
	31		45.50	1765	" "
	24	36		0.00	1765
35			0.00	1725	" "
35			19.00	1727	" witness mound.
35			58.75	1684	Creek flowing northwest to Montreal lake
34			0.00	1721	Ground at northeast corner.
33			0.00	1781	" "
32			0.00	1714	" "
31			0.00	1671	" "
25	36		0.00	1637	" "
	35		0.00	1623	" "
	35		39.63	1609	Creek, 23 ft. wide, 4 ft. deep.
	34		2.00	1612	Ground at witness mound,
	34			1609	Montreal lake, east side.
26	34		63.00	1609	" " west "
	33		0.00	1610	Ground at northeast corner (swamp).
	33		6.00	1611	" witness mound.
	32		0.00	1623	" northeast corner.
	32		76.00	1622	Creek flowing south.
	31		0.00	1623	Ground at northeast corner.
	27	36		0.00	1652
35			0.00	1673	" "
34			0.00	1701	" "
34			24.35	1691	Small lake, east side.
33			0.00	1691	Ground at northeast corner.
33			32.00	1673	Small lake.
33			48.40	1649	MacLennan river.
				1708	Ground on third meridian,

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

THIRD MERIDIAN.

MAPS 318, 368

Tp.	Sec.	Distance from S.W. Corner.		Elev.	Feature.
		Chs.	Lks.		
52	36	80.00		1694	Ground at northeast corner.
53	1	20.00		1623	Spruce river. December.
	1	80.00		1753	Ground at northeast corner.
	12	80.00		1715	" "
	13	40.00		1687	" 1/4 post.
	13	80.00		1710	" northeast corner.
	24	80.00		1763	" "
	25	71.00		1772	" witness mound.
	36	40.00		1788	" 1/4 post.
54	36	80.00		1767	" northeast corner.
	12	80.00		1782	" "
	13	58.00		1677	Spruce river.
	24	80.00		1689	Ground at northeast corner.
	25	40.00		1681	" 1/4 post.
	36	77.00		1879	" witness mound.
55	1	80.00		1709	" northeast corner.
	12	80.00		1701	" "
	13	80.00		1704	" "
	25	80.00		1715	" "
	36	80.00		1738	" "
56	1	80.00		1728	" "
	12	80.00		1766	" "
	13	80.00		1771	" "
	24	80.00		1801	" "
	25	80.00		1878	" "
	36	80.00		1880	Small lake.
57	1	80.00		1930	Ground at northeast corner, Summit.
	12	80.00		1894	" "
	13	80.00		1905	" "
	24	80.00		1873	" "
	25	80.00		1779	" "
	36	80.00		1781	" "
58	1	80.00		1789	" "
	12	80.00		1743	" "
	13	80.00		1713	" "
	24	18.00		1707	Waskesiu creek, flowing east to Montreal lake.
	24	80.00		1715	Ground at northeast corner

## ELEVATIONS OF NATURAL FEATURES.

## THIRD MERIDIAN.

MAP 368

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.	
		Chs.	Lks.			
58	25	80.00	80.00	1725	Ground at northeast corner.	
	36		80.00	1731	" "	
					1720	Crean lake, 4 miles west of line, estimated.
59	1	80.00		1750	Ground at northeast corner.	
	12	80.00		1781	" "	
	13	80.00		1786	" "	
	24	80.00		1768	" "	
	25	70.00		1715	" witness mound.	
	36		80.00		1693	" northeast corner.
				1609	Montreal lake, 8 miles east of line.	
60	1	70.00		1684	Ground at witness mound.	
	12	80.00		1667	" northeast corner.	
	13	80.00		1672	" "	
	24	80.00		1705	" "	
	25	38.00		1632	MaeLennan river, flowing east.	
	25	80.00		1668	Ground at northeast corner.	
	36	15.00		1567	" in ravine.	
	36	34.00		1649	MaeLennan river, flowing west.	
	36	80.00		1708	Ground at northeast corner.	
61	1	27.85		1650	MaeLennan river, flowing east.	
	12	20.00		1724	Ground.	
	12	38.20		1651	Creek, flowing east.	
	12	80.00		1709	Ground at northeast corner.	
	13	30.00		1749	Creek, flowing east.	
	13	80.00		1815	Ground at northeast corner.	
	24	80.00		1947	" "	
	25	48.82		1864	Creek, flowing west.	
	25	80.00		1927	Ground at northeast corner.	
	36	60.00		2070	" Summit.	
	36	80.00		2020	" northeast corner.	
	62	1	80.00		2037	" "
12		30.00		2004	" "	
12		80.00		2041	" "	
13		36.87		1974	Creek.	
13		80.00		2006	Ground at northeast corner.	
25		4.90		2002	Small lake.	
25		80.00		2007	Ground at northeast corner.	
33			80.00		2032	" "
63	1	17.50		2065	" Summit.	
	1	80.00		2008	" at northeast corner.	
	12	80.00		1941	" "	
	13	42.00		1928	Weyakwin lake, south side.	

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

THIRD MERIDIAN.

MAPS 368, 418

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
64	13	68.00		1928	Weyakwin lake, north side.
	13	80.00		1946	Ground at northeast corner.
	24	80.00		1934	" "
	25	74.65		1935	River flowing to Weyakwin lake.
	25	80.00		1938	Ground at northeast corner.
	36	7.98		1940	Creek, flowing southeast.
	36	80.00		1984	Ground at northeast corner.
	65	1	80.00		2052
12		40.00		2069	" 1/4 post.
12		80.00		2044	" northeast corner.
13		80.00		1987	" "
24		13.00		1949	Creek flowing northwest.
24		40.00		1957	Ground at 1/4 post.
24		60.00		1910	" "
24		80.00		1737	" at northeast corner.
25		16.00		1717	Creek flowing northeast.
25		80.00		1762	Ground at northeast corner.
36		80.00		1846	" "
66		1	80.00		1708
	12	67.00		1662	Creek.
	12	80.00		1664	Ground at northeast corner.
	13	80.00		1701	" "
	24	80.00		1736	" "
	25	80.00		1735	" "
	36	80.00		1726	Ground at northeast corner.
	67	1	26.00		1714
1		80.00		1683	Ground at northeast corner.
12		52.10		1584	Creek flowing northeast.
12		80.00		1590	Ground at northeast corner.
13		80.00		1652	" "
24		40.00		1535	" 1/4 post.
24		80.00		1493	" northeast corner.
25		57.20		1477	Twoforks river.
25		80.00		1483	Ground at northeast corner.
68	1	9.00		1487	" witness mound.
	1	40.00		1519	" 1/4 post.
	1	80.00		1493	" northeast corner.
	12	80.00		1501	" "
	13	59.10		1469	Creek, flowing northwest
	13	80.00		1478	Ground at northeast corner.
	24	80.00		1473	" "
	25	63.00		1445	Creek flowing northwest.
	25	80.00		1445	Ground at northeast corner.
	36	80.00		1435	" "

## ELEVATIONS OF NATURAL FEATURES.

## THIRD MERIDIAN

MAP 418

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
69	1	40.00		1431	Ground at $\frac{1}{4}$ post.
		80.00		1430	" northeast corner.
	12	34.50		1430	Creek.
	12	80.00		1430	Ground at northeast corner.
	13	80.00		1445	" "
	24	80.00		1446	" "
	25	80.00		1438	" "
	36	80.00		1432	" "
70	1	80.00		1424	" "
	12	80.00		1415	" "
	13	40.00		1428	" $\frac{1}{4}$ post.
	13	80.00		1392	" northeast corner.
	24	80.00		1383	" "
	25	13.30		1376	Small lake.
	25	80.00		1384	Ground at northeast corner.
	36	80.00		1379	" "
71	1	75.00		1313	" witness mound.
	12	77.00		1284	" "
	13	4.40		1280	Creek.
	13	73.15		1268	" "
	24	3.00		1271	Ground at witness mound.
	24	80.00		1312	" northeast corner.
	25	33.38		1272	Creek.
	25	80.00		1312	Ground at northeast corner.
	36	40.00		1325	" $\frac{1}{4}$ post.
	36	80.00		1293	" northeast corner.
72	1	80.00		1277	" "
	12	49.06		1270	Lynx creek.
	12	80.00		1290	Ground at northeast corner.
	13	80.00		1278	" "
				1275	Lynx lake, west of line, estimated.
	24	8.00		1277	Small lake.
	24	80.00		1280	Ground at northeast corner.
	25	15.00		1288	" witness mound.
	36	12.00		1288	" "
	36	80.00		1301	" northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES  
FIFTEENTH BASE LINE WEST OF THIRD MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 56

MAP 318

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		1880	Lake on third meridian.
	36	36.00		1891	Ground.
	36			1869	Lake, east side.
	34	18.00		1944	Ground.
	33	0.00		1909	" at northeast corner.
	32	0.00		1858	" "
	31			1740	Waskesiu lake, 1 mile north of line, estimated.
2	36	0.00		1761	Ground at north east corner.
	36	13.00		1757	Creek flowing to Waskesiu lake.
	35	0.00		1841	Ground at northeast corner.
	35	49.00		1880	Ground.
	34	40.00		2023	" at $\frac{1}{4}$ post.
	33	62.00		2128	" "
	32	25.00		2091	Lake.
	31	0.00		2134	Ground at northeast corner.
3	36	0.00		2152	" "
	35	0.00		2254	" "
	34	0.00		2235	" "
	33	5.00		2325	Ground. Summit.
	32	0.00		2273	" at northeast corner.
	32	78.10		2260	Creek flowing to Waskesiu lake.
	31	0.00		2262	Ground at northeast corner.
4	36	0.00		2297	" "
	35	65.00		2300	" "
	33	0.00		2254	" at northeast corner.
	32	40.00		2206	" $\frac{1}{4}$ post.
5	36	0.00		2143	" northeast corner.
	35	0.00		2041	" "
	34	40.00		1936	" $\frac{1}{4}$ post.
	32	0.00		1868	" northeast corner.
	31	0.00		1804	" "
6	36	0.00		1757	" "
	35	4.00		1700	" witness mound.
	34	40.00		1758	" $\frac{1}{4}$ post.
	33	40.00		1734	Ground at $\frac{1}{4}$ post.
	32	40.00		1653	" "
	32			1620	Delaronde lake, east side of bay.
7	36	0.00		1645	Ground at northeast corner.
	35			1620	Delaronde lake, west side of lake.
	33	0.00		1648	Ground at northeast corner.
	32			1625	Small lake, west side.
	31	0.00		1654	Ground at northeast corner.
	31	40.10		1635	Ladder creek, flowing to Pedro lake.

## ELEVATIONS OF NATURAL FEATURES.

## FIFTEENTH BASE LINE WEST OF THIRD MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 56.

MAP 318

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
8	36	0.00		1659	Ground at northeast corner.
	35	0.00		1675	" "
				1600	
	34	0.00		1610	Pedro lake, 1 mile north of line, estimated.
	34	24.60		1560	Ground at northeast corner.
	33	0.00		1622	Cowan lake, lowest elevation on this line.
	32			1640	Ground at northeast corner.
	31	60.00		1644	Small lake. Creek flowing to Cowan lake.
9	36	0.00		1657	Ground at northeast corner.
	35	0.00		1687	" "
	34	0.00		1725	" "
	33	0.00		1753	" "
	32	0.00		1736	Lake.
	32	40.00		1770	Ground at 1/4 post.
10	36	0.00		1789	" northeast corner.
	36	72.40		1738	Lake, east side.
	34	40.00		1811	Ground at 1/4 post.
	33	0.00		1690	Creek flowing south.
	33	67.00		1864	Ground.
	31	1.00		1744	" at witness mound.
11	36	0.00		1805	" northeast corner.
	35	52.00		1908	Lake, east side.
	33	40.00		1926	Ground at 1/4 post.
	32	66.00		1898	"
	31	13.50		1763	Creek flowing to Green lake.
12	36	0.00		1840	Ground at northeast corner.
	36	49.50		1771	Creek.
	35	60.00		1939	Ground.
	33	0.00		1883	" at northeast corner.
	33	31.00		1832	Lake.
	32	0.00		1879	Ground at northeast corner.
13	36	0.00		1842	" "
	36	4.00		1798	Chitek river (July).
	35	0.00		1868	Ground at northeast corner.
	35	40.00		1894	" 1/4 post.
	33	0.00		1909	" northeast corner.
	33	38.00		1822	Creek flowing north.
14	32	40.00		1843	Ground at 1/4 post.
	36	0.00		1831	" northeast corner.
	35	0.00		1852	" "
	35	29.00		1827	Sulby creek flowing north.
	34	0.00		1830	Ground at northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

FIFTEENTH BASE LINE WEST OF THIRD MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 56.

MAP 317

Rge.	Sec.	Distance from N.E. Corner.	Elev.	Feature.
14	33	0.00	1851	Ground at northeast corner.
	32	40.00	1876	
15	36	0.00	1884	" northeast corner.
	35	40.00	1865	" 1/4 post.
	33	0.00	1911	" northeast corner.
	33	40.00	1889	Alcott creek.
	33	71.00	1902	"
	32	40.00	1944	Ground at 1/4 post.
16	36	0.00	1970	" northeast corner.
	35	0.00	2023	" "
	34	0.00	1986	" "
	33	0.00	2037	" "
	33	34 28	2004	Creek, flowing north.
	32	0.00	2037	Ground at northeast corner.
	31	0.00	2109	" "
	17	36	0.00	2225
35		0.00	2338	" "
35		14.00	2298	Creek.
35		40.00	2409	Ground at 1/4 post.
34		40.00	2443	Highest point on this line.
33			2404	Creek flowing northwest to Meadow lake.
32		40.00	2422	Ground at 1/4 post.
18	36	0.00	2358	" northeast corner.
	35	40.00	2353	" 1/4 post.
	33	0.00	2329	" northeast corner.
	32	40.00	2282	" 1/4 post.
19	36	0.00	2246	" northeast corner.
	35	0.00	2192	" "
	34	0.00	2155	" "
	33	0.00	2092	" "
	32	0.00	2054	" "
	31	0.00	2006	" "
20	36	0.00	1961	" "
	36		1900	Rabbit river flows north to Makwa river.
	34	0.00	1949	Ground at northeast corner.
	33	0.00	1927	" "
	32	40.00	1937	" 1/4 post.
21	36	0.00	1934	" northeast corner.
	35	25.20	1878	Horsehead river.
	34	0.00	1897	Ground at northeast corner.
	33	1.00	1892	" witness mound.
	32	0.00	1898	" northeast corner.
	31	0.00	1912	" "

## ELEVATIONS OF NATURAL FEATURES.

## FIFTEENTH BASE LINE WEST OF THIRD MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 56.

MAP 317

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks.		
22	36	0.00	1960	Ground at northeast corner.
	35	0.00	1968	" "
	34	0.00	1942	" "
	33	0.00	1895	" "
	32	0.00	1937	" "
	32	61.00	1930	Creek flowing north to Makwa lake
	31	0.00	1935	Ground at northeast corner.
			1700	Makwa lake, 12 miles north of line, estimated.
23	36	0.00	2021	Ground at northeast corner.
	35	0.00	2049	" "
	34	0.00	2125	" "
	33	0.00	2154	" "
	33	68.00	2135	Creek flowing north to Makwa lake.
	32	0.00	2163	Ground at northeast corner.
	32	72.60	2250	Ground Summit.
24	36	0.00	2188	" at northeast corner.
	35	0.00	2098	" "
	34	0.00	2100	" "
	34	40.00	2051	" $\frac{1}{4}$ post.
	32	0.00	2095	" northeast corner.
	31	0.00	2036	" "
25	36	0.00	2015	" "
	36	15.00	2004	Peek lake, east side, April
	34	0.00	2046	Ground at northeast corner.
	33	0.00	2059	" "
	32	4.00	2112	Ground.
	31		2035	Bronson lake.
26	36	0.00	2125	Ground at northeast corner
	35	9.00	2179	" Summit.
			1895	Ministikwan lake, 10 miles north of line.
	34	0.00	2139	Ground at northeast corner.
	33	0.00	2059	" "
			2005	Muskrat lake, 2 miles north of line.
	32	0.00	2030	Ground at northeast corner.
	31	0.00	2101	" "
27	36	0.00	2063	" "
	36	61.00	2144	" "
	34	0.00	2079	" at northeast corner.
	33	0.00	2113	" "
	32	0.00	2136	" "
	31	0.00	2146	" "
1	36	0.00	2155	" Fourth meridian.



Photo by L. O. R. Dozois, D.L.S.  
P. B. M.—II 1 on Canadian Pacific Railway station, Calgary, Alberta.



Photo by J. N. WALLACE, D.L.S.  
P.B.M.—II 4 on Langevin bridge over Bow river, Calgary, Alberta.



LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.  
SIXTEENTH BASE LINE WEST OF THIRD MERIDIAN.

MAP 368

NORTH BOUNDARY OF TOWNSHIP 60.

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		1708	Ground at third meridian.
	36	40.00		1810	" " 1/4 post.
	35	0.00		1783	" northeast corner.
	34	0.00		1673	" "
	33	0.00		1701	" "
	33	40.00		1742	" " 1/4 post.
	32	0.00		1730	" northeast corner.
	31	0.00		1691	" "
2	36	0.00		1755	" "
	35	0.00		1842	" "
	35	40.00		1922	" " 1/4 post.
	34	0.00		1837	" northeast corner.
	33	0.00		1815	" "
	32	0.00		1816	" "
	31	0.00		1934	" "
3	36	0.00		1991	" "
	35	0.00		2037	" "
	34	3.00		1984	" witness mound.
	34	32.00		1952	Small lake.
	33	0.00		1951	" "
	33	40.00		1992	Ground at 1/4 post.
	32	0.00		2058	Ground at northeast corner, highest elevation on this line.
	31	0.00		2054	Ground at northeast corner.
4	36	0.00		1994	" "
	35	0.00		1952	" "
	34	0.00		1857	" "
	34	40.00		1825	" " 1/4 post.
	33	0.00		1858	" northeast corner.
	33	34.00		1776	Lavallee lake, east side.
	32	58.40		1776	" west side.
	31	0.00		1813	Ground at northeast corner.
	31	45.00		1761	Surface water.
5	36	0.00		1779	Ground at northeast corner.
	35	0.00		1758	Leaf lake.
	34			1755	Paquin lake.
	33	0.00		1790	Ground at northeast corner.
	33	40.00		1867	" " 1/4 post.
	32	0.00		1805	" northeast corner.
6	31	0.00		1768	" "
	36	0.00		1770	" "
	35	0.00		1763	" "

## ELEVATIONS OF NATURAL FEATURES.

## SIXTEENTH BASE LINE WEST OF THIRD MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 60.

MAP 368

Rge.	Sec.	Distance from N.E. Corner.	Elev.	Feature.
		<i>Chs. Lks.</i>	<i>Feet.</i>	
6	34	0.00	1759	Ground at northeast corner.
	33	0.00	1759	" "
	32	0.00	1758	" "
	31	0.00	1780	" "
7	36	0.00	1813	" "
	35	0.00	1848	" "
	34	0.00	1770	" "
	33	0.00	1742	" "
	32	27.00	1734	" witness mound.
	31	17.00	1734	" "
	31		1731	Lawrence lake.
8	36	0.00	1741	Ground at northeast corner.
	35	5.00	1736	" witness mound.
	34	0.00	1742	" northeast corner.
	34	65.50	1704	Creek, flowing to Delaronde lake.
	33	0.00	1725	Ground at northeast corner.
	32	0.00	1703	" "
	31	0.00	1625	" "
	31		1620	Delaronde lake.
9	36	0.00	1649	Ground at northeast corner.
	35	0.00	1712	" "
	34	0.00	1654	" "
			1624	Lac Voisin.
	32	0.00	1659	Ground at northeast corner.
	31	0.00	1659	" "
			1605	Taggart lake, 2 miles south of line, estimated.
10	36	0.00	1668	Ground at northeast corner.
	35	0.00	1614	" "
	35	22.00	1599	Taggart creek.
	34	0.00	1629	Ground at northeast corner.
	34	80.00	1558	Cowan river.
	33	0.00	1560	Ground at northeast corner.
	32	0.00	1568	" "
	31	0.00	1590	" "
11	36	0.00	1593	" "
	35	0.00	1580	" "
	35	11.00	1572	Creek.
	35		1572	Small lake.
	34	0.00	1606	Ground at northeast corner.
	33	0.00	1633	" "
	32	0.00	1632	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

SIXTEENTH BASE LINE WEST OF THIRD MERIDIAN.

MAPS 368, 367

NORTH BOUNDARY OF TOWNSHIP 60.

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
11	31	60.00		1611	Lake.
	31	7.00		1613	Ground at witness mound.
	31			1603	Lake.
12	36	0.00		1605	Ground at northeast corner.
	35	0.00		1587	" "
	35	40.00		1598	" 1/4 post.
	34	40.00		1592	" "
	33	0.00		1569	" northeast corner.
	32	0.00		1555	" "
	31	0.00		1559	" "
13	31			1485	Green lake, lowest elevation on this line.
	36	0.00		1541	Ground at northeast corner.
	35	0.00		1553	" "
	34	0.00		1566	" "
	33	0.00		1563	" "
	32	0.00		1589	" "
	31	0.00		1573	" "
14	36	0.00		1551	" "
	35	0.00		1552	" "
	35	40.00		1542	Ground at 1/4 post.
	34	0.00		1563	" northeast corner.
	33	0.00		1546	" "
	32	0.00		1540	" "
	31	0.00		1535	" "
15	36	0.00		1528	" "
	35	0.00		1532	" "
	34	0.00		1545	" "
	33	0.00		1550	" "
	32	40.00		1540	" 1/4 post.
	31	0.00		1561	" northeast corner.
16	36	0.00		1589	" "
	34	0.00		1551	" "
	33	0.00		1528	" "
	33			1513	Creek flowing to Meadow river.
	33	54.10		1512	Meadow river.
	32	40.00		1525	Ground at 1/4 post.
	32	61.00		1513	Morin creek.
	31	0.00		1518	Ground at northeast corner.
	31	77.90		1516	Morin creek.
17	36	0.00		1519	Ground at northeast corner.
	35	0.00		1521	" "

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## ELEVATIONS OF NATURAL FEATURES.

## SIXTEENTH BASE LINE WEST OF THIRD MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 60.

MAP 367

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
17	34	0.00		1523	Ground at northeast corner.
	33	0.00		1556	" "
	32	0.00		1531	" "
	31	0.00		1535	" "
18	36	0.00		1546	" "
	35	0.00		1579	" "
	34	0.00		1589	" "
	33	0.00		1608	" "
	32	0.00		1615	" "
	31	0.00		1635	" "
19	36	0.00		1628	" "
	36	43.00		1536	Makwa river.
	35	0.00		1631	Ground at northeast corner.
	34	0.00		1638	" "
	34	45.00		1592	Makwa river.
	33	0.00		1658	Ground at northeast corner.
	32	0.00		1649	" "
	31	0.00		1663	" "
20	36	0.00		1703	" "
	35	0.00		1682	" "
	34	0.00		1641	" "
	33	0.00		1726	" "
	32	0.00		1680	" "
	31	0.00		1686	" "
21	36	0.00		1668	" "
	35	5.00		1649	" witness mound.
	34	0.00		1709	" northeast corner.
	34	47.60		1675	Lake.
	33	27.00		1679	Ground at witness mound.
	32	0.00		1682	" northeast corner.
	31	0.00		1693	" "
22	36	0.00		1690	" "
	35	0.00		1718	" "
	34	0.00		1702	" "
	33	0.00		1700	" "
	33	35.00		1554	Beaver river, flowing northeast.
	33	40.00		1569	Ground at $\frac{1}{4}$ post.
	32	0.00		1610	" northeast corner.
	31	0.00		1704	" "
	31	32.00		1557	Beaver river, flowing southeast.
	31	40.00		1567	Ground at $\frac{1}{4}$ post.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.  
SIXTEENTH BASE LINE WEST OF THIRD MERIDIAN.

MAP 367

NORTH BOUNDARY OF TOWNSHIP 60.

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
23	36	Chs. Lks.	Feet.	
		0.00	1680	Ground at northeast corner.
	35	0.00	1758	" "
	34	2.00	1771	" witness mound.
	33	0.00	1570	" northeast corner.
	33	15.00	1563	Beaver river, flowing northeast.
	33	40.00	1595	Ground at 1/4 post
	32	0.00	1574	" northeast corner.
	32	14.00	1564	Beaver river.
	32	40.00	1770	Ground at 1/4 post.
	31	0.00	1803	" northeast corner.
24	36	0.00	1839	" "
	35	0.00	1865	" "
	34	0.00	1810	" " Summit.
	34	21.00	1810	" "
	33	0.00	1804	Lake, west side.
	33	40.00	1789	Ground at northeast corner.
	32	5.00	1651	" 1/4 post.
	32	40.00	1790	" witness mound.
	31	0.00	1818	" 1/4 post.
				" northeast corner.
25	36	0.00	1807	" "
	35	0.00	1790	" "
	34	0.00	1803	" "
	33	0.00	1780	" "
	32	0.00	1815	" "
	31	0.00	1789	" "
26	36	14.00	1816	" witness mound.
	36		1740	Mudie lake, one mile south of line.
	35	0.00	1775	Ground at northeast corner.
	35	69.40	1733	Creek flowing to Beaver river.
	3'	0.00	1745	Ground at northeast corner.
	3:	0.00	1802	" "
	3:	3.00	1756	" witness mound.
	31	0.00	1737	" northeast corner.
	31	70.44	1718	Creek.
27	36	0.00	1759	Ground at northeast corner.
	36	40.00	1772	" 1/4 post.
	35	0.00	1745	" northeast corner.
	35	80.68	1741	Creek.
	34	15.00	1748	Ground at witness mound.
	33	0.00	1757	Ground at northeast corner.
	32	0.00	1769	" "
	32	9.94	1774	" fourth meridian.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## SEVENTEENTH BASE LINE WEST OF THIRD MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 64.

MAP 368

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
1	36	Chs. lks.	Feet.	
		0.00	1984	Ground at northeast corner.
	36	79.05	1953	River flowing to Weyakwin lake.
	35	0.00	1957	Ground at northeast corner.
	34	0.00	1971	" "
	33	0.00	1979	" "
	32	0.00	1945	" "
	32	4.00	1943	Creek flowing to Weyakwin lake.
	31	0.00	1953	Ground at north east corner.
2	36	0.00	2002	" "
	35	0.00	2017	" "
	34	0.00	2078	" "
	33	0.00	2092	" "
	33	50.40	2061	Lake, east side, empties to Weyakwin lake.
	32	9.00	2065	Ground at witness mound.
3	31	0.00	2125	" northeast corner.
	36	0.00	2229	" "
	35	0.00	2182	" "
	35	36.00	2144	Lake.
	35	50.50	2213	Ground.
	34	0.00	2159	" at northeast corner.
	34	8.40	2141	Creek.
	34	38.40	2108	Lake, east side.
	33	0.00	2130	Ground at northeast corner.
	32	0.00	2158	" "
	31	0.00	2151	" "
4	36	0.00	2101	" "
	35	0.00	2055	" "
	34	0.00	1943	" "
	33	0.00	1859	" "
	33	2.05	1855	Creek flowing south.
	33	15.14	1902	Ground.
	32	0.00	1877	" at northeast corner.
	31	0.00	1836	" "
5	36	0.00	1808	Ground at northeast corner.
	35	0.00	1785	" "
			1680	Philion lake, 1/2 mile north of line.
	34	0.00	1694	Ground at northeast corner.
	34	8.20	1689	Creek flowing north to Philion lake.
	33	0.00	1702	Ground at northeast corner.
	32	0.00	1634	" "
	31	0.00	1601	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

SEVENTEENTH BASE LINE WEST OF THIRD MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 64.

MAP 368

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
6	36	Chs. Lks. 0.00	1582	Ground at northeast corner.
	36	48.72	1571	River flowing to Smoothstone lake.
	35	5.00	1573	Ground at witness mound.
	35	59.00	1570	Smoothstone lake, east side.
7	34	23.00	1570	" " west side.
	33	0.00	1609	Ground at northeast corner.
	32	0.00	1713	" "
	31	0.00	1686	" "
8	36	1.00	1579	" witness mound.
	35	0.00	1573	" northeast corner.
	34	0.00	1567	" "
	33	13.00	1565	" witness mound.
			1570	Beaupre lake, two miles south of line, estimated.
	32	0.00	1565	Ground at northeast corner.
			1570	Mirasty lake, nine miles south of line, estimated.
9	31	0.00	1583	Ground at northeast corner.
	36	0.00	1590	" "
	35	0.00	1586	" "
	35	77.52	1575	Creek flowing south to Beaupre lake.
	34	0.00	1579	Ground at northeast corner.
	33	0.00	1583	" "
	33	72.50	1703	" "
	32	1.00	1615	" at witness mound.
	32	32.00	1673	" "
	31	0.00	1633	" at northeast corner.
10			1510	Dore lake, three miles north of line, estimated.
	36	0.00	1582	Ground at northeast corner.
	35	0.00	1585	" "
	34	0.00	1585	" "
			1550	Sled lake, six miles south of line, estimated.
	33	0.00	1553	Ground at northeast corner.
	33	74.00	1549	" witness mound.
	32	70.00	1541	Lake.
	31	0.00	1543	Ground at northeast corner.
	31	75.00	1531	Sled river. November.
11	36	0.00	1533	Ground at northeast corner.
	35	0.00	1548	" "
	34	0.00	1560	" "

## ELEVATIONS OF NATURAL FEATURES.

## SEVENTEENTH BASE LINE WEST OF THIRD MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 64

MAPS 366, 367

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
11	33	0.00		1623	Ground at northeast corner.
	32	0.00		1677	" "
	31	0.00		1702	" "
12	36	0.00		1686	" "
	35	0.00		1644	" "
	34	0.00		1608	" "
	33	0.00		1544	" "
	33	38.30		1517	Creek.
	32	0.00		1542	Ground at northeast corner.
	32	66.80		1469	Beaver river. December.
13	31	0.00		1536	Ground at northeast corner.
	36	0.00		1543	" "
	36	25.50		1523	Lake, east side.
	35	0.00		1537	Ground at northeast corner.
	34	0.00		1564	" "
	32	0.00		1561	" "
	32	31.00		1526	Lake.
14	31	0.00		1538	Ground at northeast corner.
	36	0.00		1568	" "
	35	5.00		1567	" witness mound.
	35	40.00		1588	" $\frac{1}{4}$ post.
	34	5.50		1566	Ground at witness mound.
	33	0.00		1573	" northeast corner.
	33	72.50		1607	Ground.
	33	76.50		1533	Lake, east side.
	32	13.00		1540	Ground at witness mound.
	31	0.00		1543	" northeast corner.
	31	32.80		1533	Creek.
15	31	39.25		1530	Waterhen river.
	36	0.00		1545	Ground at northeast corner.
	35	0.00		1640	" "
	35	8.20		1698	" "
	34	5.00		1546	" at witness mound.
	33	3.90		1545	Creek flowing south into Waterhen river.
	32	0.00		1586	Ground at northeast corner.
16	31	0.00		1677	" "
	36	0.00		1691	" "
	35	0.00		1683	" "
	34	0.00		1697	" "
	33	0.00		1671	" "
	33	15.48		1668	Creek.
	32	0.00		1690	Ground at northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES

SEVENTEENTH BASE LINE WEST OF THIRD MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 61

MAP 367

Rge.	Sec.	Distance from NE Corner.	Elev	Feature.
16	31	Chs. Lks 0.00	Feet. 1713	Ground at northeast corner.
17	36	40.00	1729	" 1/4 post.
	35	0.00	1572	" northeast corner.
	35	60.20	1555	Creek.
	34	0.00	1572	Ground at northeast corner.
	33	0.00	1620	" "
				1570
	32	0.00	1592	Ground at northeast corner.
	32	12.50	1588	Flotten lake, east side.
18	36	0.00	1660	Ground at northeast corner.
	35	0.00	1692	" "
	34	0.00	1709	" "
	33	0.00	1798	" "
	33	16.15	1735	Creek.
	32	0.00	1787	Ground at northeast corner.
	32	5.00	1782	Indian pack trail.
	31	0.00	1969	Ground at northeast corner.
19	36	0.00	2096	" "
	36	48.99	2066	Creek.
	35	13.00	2208	Ground.
	35	47.00	2089	Creek in local valley.
	34	0.00	2240	Ground at northeast corner.
	33	0.00	2222	" "
	32	0.00	2221	" "
	32	38.15	2022	Creek in local valley flowing into Waterhen river.
	31	0.00	2237	Ground at northeast corner.
	31	63.80	2205	Creek.
20	36	0.00	2251	Ground at northeast corner.
	35	0.00	2290	" "
	35	8.50	2311	Highest point on this line.
	34	0.00	2233	Ground at northeast corner.
	34	18.10	2185	Creek flowing south.
	33	0.00	2212	Ground at northeast corner.
	33	37.60	2143	Creek flowing south.
	33	73.00	2205	Ground.
	32	0.00	2185	" at northeast corner.
	32	73.12	2130	Creek.
	31	0.00	2222	Ground at northeast corner.
21	36	0.00	2282	" "

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## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## SEVENTEENTH BASE LINE WEST OF THIRD MERIDIAN

## NORTH BOUNDARY OF TOWNSHIP 64.

MAP 367

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
21	36	28.68		2218	Creek.
	36	32.50		2281	Ground.
	35	0.00		2281	Ground at northeast corner.
	34	0.00		2150	" "
	34	27.10		2099	Creek.
	33	0.00		2212	Ground at northeast corner.
	32	0.00		2224	" "
	31	0.00		2172	" "
22	36	0.00		2161	" "
	35	0.00		2141	" "
	34	14.00		2088	" witness mound.
	33	0.00		2127	" northeast corner.
	33	37.29		2095	Creek.
	32	0.00		2159	Ground at northeast corner.
	31	19.00		2143	" "
			1630	Lac des Isles, ten miles south of line.	
23	36	0.00		2099	Ground at northeast corner.
	36	13.17		1983	Creek in local valley flows south to Waterhen river.
	35	2.00		2107	Ground at witness mound.
	34	0.00		2104	" northeast corner.
	33	0.00		2091	" "
	32	0.00		2060	" "
	32	32.90		2053	Creek.
	31	0.00		2076	Ground at northeast corner.
24	36	0.00		2042	" "
	36	14.40		2032	Creek.
				1635	Pierce lake, five miles south of line.
	35	0.00		2071	Ground at northeast corner.
	35	18.75		2045	Lake.
	34	0.00		2058	Ground at northeast corner.
	33	0.00		2062	" "
	32	0.00		2058	" "
	31	0.00		2073	" "
25	36	0.00		2045	" "
	36	63.85		2093	" "
	35	0.00		2065	" at northeast corner.
	35	27.75		1888	Creek in local valley flows south to Pierce lake.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

SEVENTEENTH BASE LINE WEST OF THIRD MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 64.

MAP 367

Rge.	Sec.	Distance from N.E. Corner.	Elev.	Feature.
25	34	Chs. Lks. 0.00	Feet. 2021	Ground at northeast corner.
	34	28.30	1893	Creek.
	33	0.00	1921	" "
	32	29.50	2000	Lake.
	31	0.00	2042	Ground at northeast corner.
26	36	0.00	1994	" "
	35	0.00	1895	" "
	35	64.15	1847	Creek flowing south into Waterhen river.
	34	0.00	1877	Ground at northeast corner.
	34	63.42	1825	Creek flowing south into Waterhen river.
	33	0.00	1834	Ground at northeast corner.
	32	9.50	1769	Ground.
	32	25.00	1753	Cold lake, east side.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## EIGHTEENTH BASE LINE WEST OF THIRD MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 68.

MAP 418

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		<i>Chs. Lks</i>		
1	36	0.00	1435	Ground at third meridian.
	35	0.00	1431	" northeast corner.
	34	0.00	1425	" "
	33	6.00	1422	" witness mound.
	33	10.00	1418	Creek flowing north.
	32	0.00	1419	Ground at northeast corner.
	31	0.00	1422	" "
2	36	0.00	1415	" "
	35	7.00	1410	" witness mound.
	35	48.50	1397	Twoforks river.
	34	0.00	1406	Ground at northeast corner.
	33	0.00	1410	" "
	32	0.00	1413	" "
	32	53.30	1394	West branch of Twoforks river.
31	0.00	1416	Ground at northeast corner.	
3	36	0.00	1436	" "
	35	0.00	1467	" "
	34	0.00	1466	" "
	34	32.00	1465	Small lake.
	33	0.00	1465	Ground at northeast corner.
	32	0.00	1471	" "
	31	0.00	1471	" "
4	36	0.00	1406	Swamp water at northeast corner.
	36	58.00	1405	Small lake.
	35	5.00	1404	Ground at witness mound.
	34	0.00	1414	" northeast corner.
	34	7.00	1393	Emmeline lake (southerly expansion).
	34	64.35	1393	Smoothstone river.
	33	8.00	1408	Ground at witness mound.
	32	0.00	1414	" northeast corner.
	31	0.00	1413	" "
	31	62.50	1397	Smoothstone river.
5	36	0.00	1400	Ground at northeast corner.
	35	0.00	1472	" "
	34	0.00	1512	" "
	33	0.00	1533	" "
	32	0.00	1504	" "
	32	58.40	1499	Creek.
	31	0.00	1504	Ground at northeast corner.
6	36	0.00	1519	" "
	35	0.00	1633	" "
	34	0.00	1559	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES  
EIGHTEENTH BASE LINE WEST OF THIRD MERIDIAN.

MAP 418

NORTH BOUNDARY OF TOWNSHIP 68.

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
6	33	0.00	1597	Ground at northeast corner.
	33	79.00	1558	" witness mound.
	32	47.10	1542	Creek flowing southeast.
	31	0.00	1547	Ground at northeast corner.
	31	16.15	1544	Creek flowing southeast to Smoothstone river.
7	36	7.00	1559	Ground at witness mound.
	36	80.00	1558	" "
	35	18.10	1558	Creek flowing northeast.
	34	2.00	1565	Ground at witness mound.
	34	18.30	1569	Creek flowing to Doré Lake.
	33	0.00	1621	Ground at northeast corner.
	32	0.00	1659	" "
	31	0.00	1677	" "
31	50.25	1675	Creek flowing southeast.	
8	36	0.00	1683	Ground at northeast corner.
	35	0.00	1719	" "
	34	0.00	1730	" "
	33	0.00	1720	" "
	32	0.00	1686	" "
9	31	0.00	1690	" "
	36	0.00	1715	" "
	36	35.25	1667	Crossing of Portage from Doré lake to Lac la Plonge.
	35	0.00	1722	Ground at northeast corner.
	34	5.00	1852	" Summit.
	33	0.00	1781	" "
	32	0.00	1653	" "
	32	73.00	1636	Crossing of winter road from Doré lake to Lac la Plonge.
31	0.00	1636	Ground at northeast corner.	
10	36	0.00	1649	" "
			1510	Doré lake, two miles south of line, estimated.
	35	0.00	1649	Ground at northeast corner.
	34	0.00	1620	" "
	34	61.00	1592	Small lake.
	32	0.00	1625	Ground at northeast corner.
11	31	0.00	1595	" "
	36	0.00	1599	" "
	35	3.00	1571	" witness mound.
	34	0.00	1552	" northeast corner.

## ELEVATIONS OF NATURAL FEATURES.

## EIGHTEENTH BASE LINE WEST OF THIRD MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 68.

MAPS 418, (417)

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
11	34	1.25		1551	Winter road from Doré lake to Ile a la Crosse.
	33	0.00		1532	Ground at northeast corner.
	33	33.30		1521	Oisen creek, flowing southwest to Doré river.
	32	0.00		1519	Ground at northeast corner.
	31	0.00		1488	" "
	12	36	0.00		1449
35		0.00		1442	" "
34		0.00		1434	" "
34		65.50		1377	Beaver river, east side. September.
33		0.00		1448	Ground at northeast corner.
32		0.00		1423	" "
31		0.00		1449	" "
13	36	0.00		1420	Lake at northeast corner.
	35	0.00		1429	Ground at northeast corner.
	34	0.00		1462	" "
	33	0.00		1488	" "
	32	0.00		1492	" "
	31	0.00		1504	" "
14	36	9.00		1499	" witness mound.
	35	0.00		1484	" northeast corner.
	35	27.54		1464	Creek, flowing north.
	35	80.50		1473	Keeley river, flowing northerly.
	34	0.00		1477	Ground at northeast corner.
	33	0.00		1509	" "
	33	68.00		1538	" witness mound.
	33	70.00		1486	Keeley lake, east side.
15	34	20.00		1486	Keeley lake, west side.
	34	40.00		1573	Ground at $\frac{1}{4}$ post.
	33	0.00		1622	" northeast corner.
	32	0.00		1649	" "
	31	0.00		1651	" "
16	36	0.00		1661	" "
	35	0.00		1664	" "
	34	0.00		1735	" "
	34	38.50		1780	" Summit.
	33	0.00		1717	" at northeast corner.
	33	65.00		1597	Creek.
	32	0.00		1639	Ground at northeast corner.
	31	0.00		1727	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES

EIGHTEENTH BASE LINE WEST OF THIRD MERIDIAN.

MAP (417)

NORTH BOUNDARY OF TOWNSHIP 6S.

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
16	31	Chs. 72.00	Lks. 1765	Crossing of winter road going north to Canoe river.
17	36	0.00	1772	Ground at northeast corner.
	35	0.00	1772	" "
	34	0.00	1807	" "
	33	0.00	1753	" "
	33	12.00	1742	Creek, flowing southeast to Keeley lake.
	33	40.00	1823	Ground at $\frac{1}{4}$ post.
	32	0.00	1882	" northeast corner.
	31	0.00	1838	" " (flooded)
18	36	0.00	1950	" "
	35	0.00	2019	" "
	34	0.00	2011	Ground at northeast corner.
	34	6.00	1996	Creek.
	33	0.00	2058	Ground at northeast corner.
	32	0.00	2071	" "
	32	43.50	2007	Creek flowing northerly to Canoe lake.
	31	0.00	2045	Ground at northeast corner.
19	31	76.00	2088	" witness mound.
	35	0.00	2147	" northeast corner.
	34	0.00	2174	" "
	33	0.00	2231	" "
	32	0.00	2332	" "
	31	0.00	2268	" " (flooded)
20	36	0.00	2241	" "
	35	0.00	2218	" "
	34	0.00	2205	" "
	33	0.00	2209	" "
	32	0.00	2235	" "
	31	0.00	2191	" "
21	36	0.00	2158	" "
	35	0.00	2155	" "
	35	75.50	2128	Creek flowing southwesterly to Primrose Lake.
	34	0.00	2141	Ground at northeast corner.
	33	0.00	2122	" "
	33	71.00	2096	Creek flowing southwest.
	32	0.00	2108	Ground at northeast corner (flooded).
22	31	0.00	2106	" "
	36	0.00	2102	" "

## ELEVATIONS OF NATURAL FEATURES.

## EIGHTEENTH BASE LINE WEST OF THIRD MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 68.

MAP (417)

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
22	35	0.00		2094	Ground at northeast corner (flooded).
	34	0.00		2093	Lake at northeast corner.
	34	28.00		2095	Ground at witness mound.
	33	0.00		2093	" northeast corner (flooded).
	33	72.00		2084	Small lake.
	32	0.00		2084	Ground at northeast corner (flooded).
	32	44.00		2069	Creek flowing southwest.
	31	0.00		2090	Ground at northeast corner.
	23	36	0.00		2049
35		0.00		2012	" "
34		0.00		2011	" " (flooded)
33		0.00		2003	" " "
32		0.00		1997	" " "
31		0.00		1989	" " "
24	36	0.00		1976	" "
	36	72.00		1963	" witness mound.
	36	75.00		1960	Primrose lake, east side.
26	34	52.10		1960	" west side.
	34	65.00		1964	Crossing of wagon road.
	33	0.00		1968	Ground at northeast corner.
	32	0.00		1978	" "
	32	45.00		1979	Shaver river.
	31	0.00		1995	Ground at northeast corner.
27	36	0.00		2117	" "
	35	0.00		2047	" "
1	36	0.00		2118	" fourth meridian.



Photo by L. O. R. Dozors, D.L.S.  
P.B.M.—F 26 at Battleford Junction,  
Saskatchewan.



Photo by J. N. WALLACE, D.L.S.  
T.B.M. on spike on telegraph pole.



Photo by J. N. WALLACE, D.L.S.  
P.B.M.—H 7 on large boulder near Calgary, Alberta.



LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

NINETEENTH BASE LINE WEST OF THIRD MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 72.

MAP 418

Reg.	Sec.	Distance from NE. Corner.		Elev.	Feature.	
		Chs.	Lks.			
1	36	0.00		1301	Ground at northeast corner.	
	36	13.00		1302	Small lake.	
	35	0.00		1304	Ground at northeast corner.	
	35	18.00		1309	" in swamp.	
	35	40.00		1290	Small lake.	
	34	0.00		1291	Ground at northeast corner.	
	34	24.00		1283	Pond.	
	33	1.00		1281	Ground at witness mound.	
	32	2.00		1288	" "	
	32	43.80		1281	Small lake.	
	31	0.00		1283	Ground at northeast corner.	
	31	62.00		1280	Lake, east side.	
	2	36	0.00		1289	Ground at northeast corner, on island.
		36	43.00		1280	Lake west side.
36		78.00		1294	Ground at witness mound.	
35		66.40		1289	Small lake.	
34		0.00		1288	Ground at northeast corner.	
33		0.00		1324	" "	
33		11.20		1293	Lake, east side.	
32		13.20		1293	" west side.	
32		16.00		1313	Ground at witness mound.	
32		62.00		1295	Creek.	
32		73.00		1319	Ground.	
31		0.00		1301	Lake at northeast corner.	
31		26.00		1325	Ground, Summit.	
3		36	0.00		1313	Ground at northeast corner.
	36	79.50		1280	Creek.	
	35	0.00		1280	Ground at northeast corner.	
	35	20.00		1284	Small lake.	
	34	0.00		1337	Ground at northeast corner.	
	33	0.00		1308	" "	
	32	0.00		1325	" "	
	32	65.60		1275	Creek.	
	31	0.00		1279	Ground at northeast corner.	
	31	20.00		1293	" witness mound.	
	4	36	0.00		1293	" northeast corner.
36		28.00		1272	" in swamp.	
36		78.50		1261	Wistigo creek.	
				1260	Snake lake, north of line.	
35		0.00		1262	Ground at northeast corner.	
34		4.00		1274	" witness mound.	
33		0.00		1269	" northeast corner.	
32		0.00		1280	" "	
31		0.00		1272	" "	

ELEVATIONS OF NATURAL FEATURES.  
 NINETEENTH BASE LINE WEST OF THIRD MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 12

MAP 418

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
4	31	Obs. Lks. 70.00	1260	Smoothstone river, lowest elevation on this line.
5	36	4.00	1266	Ground at witness mound.
	35	0.00	1275	" northeast corner.
	34	0.00	1289	" "
	34	27.00	1305	Lake.
	33	0.00	1330	Ground at northeast corner.
	33	24.80	1345	"
	33	59.00	1262	Tippo river, flowing north.
	32	4.00	1297	Ground at witness mound.
	31	0.00	1376	" northeast corner.
6	36	0.00	1389	" "
	35	0.00	1428	" "
	35	15.47	1455	" Summit.
	35	70.75	1398	Creek.
	34	0.00	1423	Ground at northeast corner.
	34	24.00	1387	Creek.
	34	57.80	1391	"
	33	0.00	1424	Ground at northeast corner.
	33	20.00	1467	"
	32	0.00	1523	" at northeast corner.
	31	0.00	1541	" "
7	36	0.00	1557	" "
	35	0.00	1609	" "
	35	40.00	1637	" $\frac{1}{4}$ post Summit.
	34	0.00	1611	" northeast corner.
	34	20.00	1610	Water in swamp.
	33	0.00	1612	Ground at northeast corner.
	32	0.00	1571	" "
	31	0.00	1526	" "
	31	25.20	1494	Massinahigan river.
8	36	0.00	1527	Ground at northeast corner.
	35	4.00	1563	"
	34	0.00	1614	" at northeast corner.
	33	0.00	1604	" "
	33	29.00	1611	Small lake.
	32	0.00	1639	Ground at northeast corner.
	31	0.00	1690	" " Summit.
9	36	0.00	1686	" "
	35	0.00	1645	" "
	34	0.00	1636	" "
	33	0.00	1643	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.  
NINETEENTH BASE LINE WEST OF THIRD MERIDIAN.

MAP 418

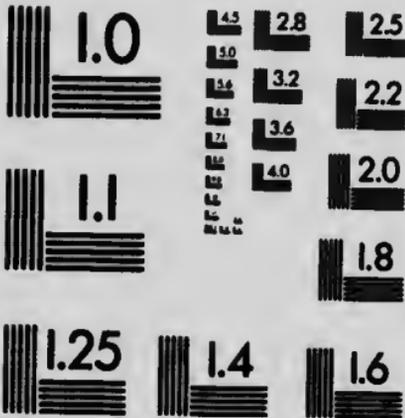
NORTH BOUNDARY OF TOWNSHIP 72.

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
9	32	Chs. Lks.	Feet.	
	31	0.00	1641	Ground at northeast corner.
		0.00	1621	" "
10	36	0.00	1617	" "
	36	40.00	1573	Small lake.
	35	8.00	1584	Ground at witness mound.
	35	15.40	1607	" "
	35	40.00	1567	" at 1/4 post.
	34	0.00	1507	" northeast corner.
	33	0.00	1501	" "
	32	0.00	1517	" "
	31	0.00	1475	" "
11	36	0.00	1475	" "
	35	0.00	1459	" "
	34	0.00	1415	" "
	34	54.00	1444	" "
	33	48.00	1378	Beaver river, February (water probably flooding back from Ile a la Crosse lake).
	33	70.00	1389	Ground.
	32	0.00	1417	Ground at northeast corner.
	32	28.50	1432	Ground.
	31	0.00	1408	" at northeast corner (flooded).
12	36	0.00	1416	" "
	35	0.00	1414	" "
	34	0.00	1410	" "
	34	77.00	1405	" witness mound.
	32	0.00	1378	Ile a la Crosse lake.
	31	2.00	1389	Ground at witness mound.
	31	55.16	1457	" "
13	36	0.00	1425	" at northeast corner.
	36	76.00	1411	" witness mound.
	35	0.00	1413	Lake.
	34	0.00	1416	Ground at northeast corner.
	33	0.00	1433	" "
	32	0.00	1426	" "
	31	0.00	1427	" "
14	36	0.00	1415	" "
	35	0.00	1413	" "
	34	0.00	1411	" "
	34	45.00	1401	Canoe river.
	33	0.00	1409	Ground at northeast corner.
	32	0.00	1413	" "
	31	0.00	1417	" "



# MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



**APPLIED IMAGE Inc**

1653 East Main Street  
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(716) 482-0300 - Phone  
(718) 288-5989 - Fax

## ELEVATIONS OF NATURAL FEATURES.

## NINETEENTH BASE LINE WEST OF THIRD MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 72.

MAP (417)

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
15	36	0.00	1420	Ground at northeast corner.
	35	0.00	1431	" "
	34	2.00	1440	" witness mound.
	33	0.00	1438	" northeast corner.
			1405	Canoe lake, south of line, estimated.
	32	0.00	1438	Ground at northeast corner.
	31	0.00	1439	" "
	16	36	0.00	1440
35		0.00	1457	" "
34		0.00	1442	" "
33		0.00	1449	" "
32		0.00	1454	" "
31		0.00	1461	" "
17	36	0.00	1473	Ground at northeast corner.
	35	0.00	1517	" "
	34	0.00	1514	" "
	33	0.00	1513	" "
	32	0.00	1521	" "
	32	24.00	1549	" witness mound.
	32	29.67	1631	" Summit.
	31	0.00	1545	" at northeast corner.
18	36	0.00	1542	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

FOURTH MERIDIAN.

MAPS 366, 416

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.	
		Chs.	Lks.			
60	36	80.00		1774	Ground at northeast corner.	
61	1	52.50		1709	Creek.	
	12	10.00		1749	Ground.	
	12	80.00		1676	" at northeast corner.	
	13			1597	Beaver river. August.	
	13	40.00		1744	Ground at 1/4 post.	
	24	10.00		1764	Small lake.	
	25	1.00		1765	Ground.	
	25	80.00		1776	" at northeast corner.	
	36	40.00		1857	" 1/4 post.	
	62	1	1.00		1831	" witness mound.
1		35.20		1790	" crossing of wagon road.	
1		80.00		1866	" northeast corner.	
12		40.00		1838	" 1/4 post.	
12		79.00		1753	"	
13		80.00		1769	" at northeast corner.	
24		57.00		1790	"	
25		4.00		1754	"	
25		80.00		1756	" at northeast corner.	
36		40.00		1820	" 1/4 post.	
36		80.00		2047	" northeast corner.	
63		1	76.00		2178	"
		12	80.00		1955	" at northeast corner.
	13	40.00		1780	" 1/4 post.	
	13	42.00		1753	Cold lake, south side.	
65	24	9.00		1753	" north "	
	24	21.00		1789	Ground.	
	24	25.00		1836	"	
	24	40.00		1926	" at 1/4 post.	
	24	80.00		1982	" northeast corner.	
	25	58.50		1973	"	
	25	80.00		1893	" at northeast corner.	
	36	80.00		1907	"	
	66	1	25.25		1838	"
1		80.00		1845	" at northeast corner.	
12		36.50		1808	Martineau river.	
12		66.00		1846	Ground.	
13		80.00		1948	" at northeast corner.	
24		80.00		1984	"	
25		40.00		1959	" 1/4 post.	
25		80.00		1981	" northeast corner.	
36		59.00		1993	"	
36		80.00		1980	Small lake at northeast corner.	

## ELEVATIONS OF NATURAL FEATURES.

## FOURTH MERIDIAN.

MAPS 416

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
67	1	52.00		2023	Ground, highest elevation between Cold lake and Primrose lake.
	1	60.00		1961	Primrose lake, south side.
	35			1961	" " north "
	36	40.00		2020	Ground at $\frac{1}{4}$ post.
	36			1993	Creek.
68	36	80.00		2009	Ground at northeast corner.
	1	80.00		2006	" "
	12	80.00		2017	" "
	13	80.00		2014	" "
	24	80.00		2043	" "
69	25	77.00		2049	" witness mound.
	36	80.00		2118	" northeast corner.
	1	76.15		2038	Shaver river.
	12	40.00		2100	Ground at $\frac{1}{4}$ post.
	12	80.00		2132	" northeast corner.
70	13	80.00		2168	" "
	24	80.00		2179	" "
	25	40.00		2220	" $\frac{1}{4}$ post.
	25	80.00		2285	" northeast corner.
	36	20.00		2321	" "
	36	80.00		2324	" at northeast corner. Summit.
	1	64.60		2260	Small lake.
71	12	80.00		2274	Ground at northeast corner.
	13	41.50		2262	Farrier creek.
	24	20.00		2273	Ground.
	24	79.90		2266	Farrier Creek.
	25	80.00		2274	Ground at northeast corner.
	36	80.00		2313	" "
72	1	80.00		2311	" "
	12	80.00		2332	" "
	24	35.40		2288	Lake.
	25	29.30		2258	Victor creek. July.
	25	80.00		2250	Ground at northeast corner.
	36	48.24		2205	Creek.
73	36	80.00		2229	Ground at northeast corner.
	1	80.00		2244	" "
	12	67.00		2245	Lake.
	13	40.00		2272	Ground at $\frac{1}{4}$ post.
	24	28.30		2221	Lake.
	24	80.00		2223	Ground at northeast corner.
	36	7.04		2195	Creek.
	36	80.00		2198	Ground at northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

FOURTH MERIDIAN.

MAP 466

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
73	1	61.00		2175	Calder river.
	12	80.00		2183	Ground at northeast corner.
	13	60.00		2197	" "
	24	14.86		2182	Neath creek.
	24	80.00		2192	Ground at northeast corner.
	25	80.00		2224	" "
	36	80.00		2275	" "
74	1	80.00		2353	" "
	12	80.00		2372	" "
	13	60.00		2404	Highest elevation on 4th meridian, north of township 36.
	24	80.00		2366	Ground at northeast corner.
	25	80.00		2322	" "
	36	80.00		2337	" "
75	1	80.00		2295	" "
	12	80.00		2276	" "
	24	20.00		2185	Creek.
	24	80.00		2190	Ground at northeast corner.
	25	80.00		2141	" "
	36	80.00		2040	" "
76	1	60.00		1972	" "
	12	16.00		1937	Clatte river, east of line.
	12	40.00		1953	Ground at $\frac{1}{4}$ post.
	13	40.00		1927	" "
	13	80.00		1932	" northeast corner.
	24	60.00		1939	" "
	25	63.65		1908	Small lake, south side.
	36	80.00		1915	Ground at northeast corner.
77	12	40.00		1871	" $\frac{1}{4}$ post.
	13	60.00		1838	" "
	24	40.00		1882	" at $\frac{1}{4}$ post.
	25	41.40		1824	Creek.
	36	20.00		1967	Ground.
	36	80.00		1898	" at northeast corner.
78	1	25.05		1823	Dillon river (watershed of Churchill river)
	1	40.00		1918	Ground at $\frac{1}{4}$ post.
	12	40.00		1923	Crossing of height of land between Hudson Bay and Arctic Ocean.
	12	80.00		1893	Ground at northeast corner.
	13	80.00		1954	" "
	24	80.00		1886	" "
	25	80.00		1853	" "
	36	80.00		1813	" "

## ELEVATIONS OF NATURAL FEATURES

## FOURTH MERIDIAN.

MAPS 466, 516

Rge.	Sec.	Distance from SE. Corner.	Elev.	Feature.
79	1	Chs. Lks. 43.60	Feet. 1771	Sweezy creek (watershed of Athabaska river)
	12	80.00	1816	Ground at northeast corner.
	13	80.00	1808	" "
	24	80.00	1796	" "
	36	40.00	1777	" $\frac{1}{4}$ post.
	36	79.00	1726	" witness mound.
80	1	11.61	1716	Graham creek.
			1719	Graham lake, east of line, estimated.
			1700	Landels river, four miles west of line, estimated.
	1	80.00	1769	Ground at northeast corner.
	12	80.00	1804	" "
	13	40.00	1780	" at $\frac{1}{4}$ post.
	24	80.00	1759	" northeast corner.
	25	80.00	1742	" "
36	80.00	1722	" "	
81	1	21.20	1713	Creek flowing east.
	1	80.00	1726	Ground at northeast corner.
	12	29.44	1752	" "
	13	12.08	1708	Creek flowing east.
	13	80.00	1746	Ground at northeast corner.
	25	20.00	1803	" Summit.
	36	40.00	1683	" at $\frac{1}{4}$ post.
82	1	40.00	1696	" "
	12	42.03	1619	Newby river.
	12	80.00	1652	Ground at northeast corner.
	13	40.00	1667	" $\frac{1}{4}$ post.
	24	16.92	1648	Creek flowing east.
	24	80.00	1616	Ground at northeast corner.
	25	31.00	1580	Creek flowing west.
	36	20.00	1614	Ground.
	36	80.00	1621	" at northeast corner.
83	1	40.00	1625	Crossing of the Height of land.
	12	40.00	1614	Ground at $\frac{1}{4}$ post.
	13	20.00	1532	" northeast corner.
	24	40.58	1537	Kimiwan creek (water high), draining to Churchill river.
	25	20.00	1555	Ground.
	25	76.00	1578	Crossing of the Height of land.
	25	80.00	1574	Ground at northeast corner.
	36	34.05	1532	Formby lake, draining to Athabaska river.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

FOURTH MERIDIAN.

MAPS 516, 566

Tp.	Sec.	Distance from SE. Corner.	Elev.	Feature.	
84	1	Cl.. Lks.	Feet.		
	12	80.00	1536	Ground at northeast corner.	
	13	80.00	1597	" " " Height of land.	
	13	40.00	1549	Ground at 1/4 post.	
	13	48.00	1537	Garson lake, south side (water high).	
85	13	23.00	1537	" " north side.	
	13	40.00	1539	This lake drains to Churchill river.	
	13	80.00	1548	Ground at 1/4 post.	
	24	80.00	1567	" northeast corner.	
	25	40.00	1568	" "	
	36	40.00	1588	" 1/4 post.	
	36	80.00	1580	Ground at 1/4 post.	
				" northeast corner.	
86	1	25.00	1580	Raft lake (water high).	
	1	80.00	1588	Ground at northeast corner.	
	12	80.00	1607	" "	
	13	80.00	1643	" "	
	24	80.00	1662	" "	
	25	36.00	1688	Crossing of the Height of land. North of here all water drains to Athabaska river.	
	25	80.00	1669	Ground at northeast corner.	
	36	80.00	1656	" "	
	87	1	80.00	1657	" "
		12	80.00	1640	" "
24		20.00	1649	" "	
25		20.00	1607	" "	
25		43.30	1595	Edwin river.	
25		80.00	1622	Ground at northeast corner.	
36		80.00	1614	" "	
88		1	80.00	1605	" "
	12	42.56	1594	Rattlepan creek flowing west.	
	13	80.00	1615	Ground at northeast corner.	
	24	80.00	1632	" "	
	25	46.26	1627	Crossing of trail to Methye Portage.	
	25	80.00	1629	Ground at northeast corner.	
	36	80.00	1608	" "	
89	1	14.00	1602	"	
	1	23.00	1480	"	
	1	40.00	1266	" at 3/4 post.	
	1	80.00	1012	" northeast corner.	
	12	39.20	1002	Clearwater river, south side.	
	12	45.77	1002	" " north side.	

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

MAP 566

## FOURTH MERIDIAN.

Tp.	Sec.	Distance from SE. Corner.	Elev.	Feature.
89	12	Chs. Lks. 45.98	Feet. 1006	Bench mark, top of iron post, in centre of line, 14 feet north of edge of bank of river.
	12	80.00	1255	Ground at northeast corner.
	13	9.51	1386	"
	13	40.00	1603	" at $\frac{1}{4}$ post.
	13	80.00	1618	" northeast corner.
	24	37.15	1769	"
	24	40.00	1660	" at $\frac{1}{4}$ post in ravine.
	24	55.60	1824	"
	24	80.00	1792	" northeast corner.
	25	80.00	1768	" "
36	80.00	1820	" "	
90	1	20.00	1840	" Summit.
	1	80.00	1701	" at northeast corner.
	12	80.00	1654	" "
	13	80.00	1615	" "
	24	18.00	1674	"
	25	32.45	1604	Sutton creek. Depression.
	25	80.00	1621	Ground at northeast corner.
	36	80.00	1700	" "
91	1	21.00	1660	Creek flowing west.
	1	80.00	1676	Ground at northeast corner.
	12	80.00	1721	" "
	13	80.00	1710	" "
	24	63.60	1743	"
	25		1683	Gordon creek.
	25	80.00	1702	Ground at northeast corner.
	36	80.00	1791	" "
92	1	49.37	1676	Creek flowing west.
	12	40.00	1771	Ground at $\frac{1}{4}$ post.
	12	80.00	1771	" northeast corner.
	13	63.12	1822	"
	13	73.23	1735	Lake.
				Many small lakes among hills in townships 92 to 95. These lakes have no outlet and are all at the same elevation within a few feet.
92	24	48.66	1920	Ground. Summit.
	25	80.00	1852	" at northeast corner.
	36	80.00	1752	" "
93	1	16.85	1900	"
	1	80.00	1873	" at northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NAT' FEATURES.

FOURTH MERIDIAN.

MAPS 566, (616)

Tp.	Sec.	Distance from SE. Corner.	Elev.	Feature.	
93	12	Chs. Lks. 32.60	Feet. 1950	Ground. Summit.	
	13	40.00	1833	" at 1/4 post.	
	24	22.39	1912	"	
	24	80.00	1810	" at northeast corner.	
	25	80.00	1786	" "	
	36	68.56	1919	" Summit.	
	36	80.00	1848	" at northeast corner.	
94	1	52.00	1738	Small lake.	
	1	80.00	1774	Ground at northeast corner.	
	12	80.00	1760	" "	
	13	56.63	1846	"	
	13	80.00	1788	" at northeast corner.	
	24	10.00	1750	"	
	24	60.00	1876	" Summit.	
	25	73.00	1738	Small lake.	
	36	80.00	1787	Ground at northeast corner.	
95	1	80.00	1802	" "	
	12	40.00	1748	" 1/4 post.	
	12	76.00	1952	Summit of high ridge.	
	13	40.00	1775	Ground at 1/4 post.	
	13	70.00	1799	"	
	24	80.00	1714	" at northeast corner.	
	25	80.00	1727	" "	
	36	50.00	1648	Creek.	
	36	80.00	1690	Ground at northeast corner.	
		1	64.50	1663	Creek.
		1	80.00	1676	Ground at northeast corner.
		12	38.00	1596	" witness mound.
		13	10.00	1665	"
		13	80.00	1650	" at northeast corner.
		24	80.00	1722	Ground at northeast corner.
		25	49.00	1645	Firebag river.
		25	80.00	1713	Ground at northeast corner.
	36	66.10	1802	"	
	36	80.00	1738	" at northeast corner.	
97	1	40.00	1742	" 1/4 post.	
	12	7.95	1660	Creek.	
	12	80.00	1752	Ground at northeast corner.	
	24	15.20	1876	"	
	24	80.00	1745	" at northeast corner.	
	25	18.55	1672	Creek.	
	25	80.00	1800	Ground at northeast corner.	
	36	13.75	1750	Creek.	
	36	80.00	1858	Ground at northeast corner.	

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## FOURTH MERIDIAN.

MAP (616)

Tp.	Sec.	Distance	Elev.	Feature.	
		from SE. Corner.			
98		Chs. Lks.			
	1	5.39	1788	Lake.	
	1	80.00	1886	Ground at northeast corner.	
	12	40.00	1919	" $\frac{1}{4}$ post.	
	12	80.00	1918	" northeast corner.	
	13	76.30	1993	Highest elevation on meridian north of Clearwater river.	
	24	40.00	1882	Ground at $\frac{1}{4}$ post.	
	24	64.00	1923	"	
	25	10.00	1834	"	
	25	80.00	1887	" at northeast corner.	
	36	60.00	1901	"	
	36	80.00	1774	" at northeast corner.	
	99	1	24.20	1713	Creek, headwaters of Firebag river.
		1	80.00	1824	Ground at northeast corner.
		12	80.00	1672	" "
13		40.00	1688	" $\frac{1}{4}$ post.	
13		80.00	1808	" northeast corner.	
24		80.00	1825	" "	
25		80.00	1817	" "	
36		14.60	1808	" "	
36		80.00	1871	" "	
100	1	46.30	1962	" Summit.	
	1	80.00	1947	" at northeast corner.	
	12	24.60	1909	"	
	12	65.60	1682	"	
	12	80.00	1816	" at northeast corner.	
	13	20.00	1878	"	
	13	80.00	1656	" north east corner.	
	24	60.00	1596	"	
	25	10.00	1496	"	
	25	80.00	1478	" at northeast corner.	
	36	73.82	1413	Richardson river, 30C feet wide.	
101	1	40.00	1587	Ground at $\frac{1}{4}$ post.	
	1	51.60	1554	Creek.	
	12	24.90	1844	Ground.	
	12	80.00	1629	" at northeast corner. Summit.	
	13	22.00	1784	"	
	13	60.00	1524	Creek.	
	13	80.00	1600	Ground at northeast corner.	
	24	32.40	1702	"	
	24	80.00	1478	" at northeast corner.	
	25	25.00	1603	"	
	25	80.00	1402	" at northeast corner.	
	36	17.90	1384	Creek. Depression.	
	36	80.00	1535	Ground at northeast corner.	

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

FOURTH MERIDIAN.

MAP (616)

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
102	1	40.00		1570	Ground at $\frac{1}{4}$ post.
	1	80.00		1503	" northeast corner.
	12	54.00		1385	Cache creek.
	12	80.00		1415	Ground at northeast corner.
	13	40.00		1462	" $\frac{1}{4}$ post
	13	73.30		1608	"
	24	24.20		1472	" Summit.
	24	40.00		1460	"
	24	80.00		1488	" at $\frac{1}{4}$ post.
	25	80.00		1444	" northeast corner.
	36	47.00		1368	"
	36	80.00		1420	Creek.
	103	1	80.00		1354
12		80.00		1351	" "
13		51.65		1305	" "
13		80.00		1323	Lake, source of south branch Old Fort river.
24		42.15		1320	Ground at northeast corner.
24		80.00		1332	Lake.
25		80.00		1348	Ground at northeast corner.
36		68.45		1324	" "
					Lake.
104	1	80.00		1322	Ground at northeast corner.
	12	43.30		1307	Creek, headwaters of Old Fort river.
	13	0.00		1289	Ground at witness mound.
	13	27.40		1332	"
	13	54.30		1284	Lake.
	24	40.00		1292	Ground at $\frac{1}{4}$ post.
	24	80.00		1278	" at northeast corner.
	25	20.60		1252	Lake.
	25	.00		1291	Ground at northeast corner.
	36	0.00		1254	" "
105	1	37.00		1188	Lake.
	1	80.00		1186	Ground at northeast corner.
	12	11.40		1156	Old Fort river.
	12	80.00		1171	Ground at northeast corner.
	13	48.60		1126	Lake, draining to Old Fort river, half a mile east.
	13	80.00		1129	Ground at northeast corner.
	24	80.00		1119	" "
	25	33.20		1114	Lake.
	25	80.00		1115	Ground at northeast corner.
	36	5.90		1109	Old Fort river.
	36	80.00		1120	Ground at northeast corner.
106	1	80.00		1120	" "

## ELEVATIONS OF NATURAL FEATURES.

## FOURTH MERIDIAN.

MAP (666)

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
106	12	16.30	1060	Lake.	
	12	40.00	1086	Ground at $\frac{1}{4}$ post.	
	13	26.50	1021	Lake.	
	13	80.00	1014	Beatty river, flowing to Old Fort river.	
	24	6.00	1024	Ground.	
	24	25.00	1013	Beatty river.	
	24	80.00	1011	Ground at northeast corner.	
	25	4.15	1010	Old Fort river, 80 ft. wide.	
	25	59.00	1079	Ground.	
	36	71.15	1004	Old Fort river.	
107	1	40.00	1060	Ground at $\frac{1}{4}$ post.	
	12	80.00	1007	" northeast corner.	
	13	34.40	1002	Lake.	
	24	80.00	998	Ground at northeast corner.	
	25	60.30	978	Lake.	
	36	80.00	965	Ground at northeast corner.	
108	1	50.50	942	Creek.	
	12	60.40	896	Douglas river, 100 ft. wide, flowing to Old Fort river, half a mile west.	
	13	80.00	914	Ground at northeast corner.	
	24	79.30	902	Lake, south side, draining to Old Fort river, two miles west.	
	25	21.40	949	Ground, point of land..	
	25	40.50	902	Lake, north side.	
	25	80.00	951	Ground at northeast corner.	
	36	80.00	951	" "	
	109	1	57.80	928	Lake.
12		80.00	947	Ground at northeast corner.	
13		80.00	956	" "	
24		80.00	942	" "	
25		59.60	919	Lake, expansion of Harrison river.	
110	1	40.00	924	Ground at $\frac{1}{4}$ post.	
	12	80.00	930	" northeast corner.	
	13	79.70	930	Lake.	
	25	40.00	946	Ground, at $\frac{1}{4}$ post.	
	36	80.00	968	Ground at northeast corner.	
111	1	80.00	935	" "	
	13	40.00	937	" $\frac{1}{4}$ post.	
	24	63.00	989	" "	
	25	80.00	950	" northeast corner.	
	36	12.80	913	Lake.	
	36	80.00	930	Ground at northeast corner.	

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

FOURTH MERIDIAN.

MAP (716)

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
112	1	30.50		898	Lake.
	12	40.00		899	Ground at $\frac{1}{4}$ post.
	13	80.00		860	" northeast corner.
	24	40.00		860	Swamp, headwaters of Claussen creek.
	25	40.00		936	Ground at $\frac{1}{4}$ post.
	36	80.00		878	" northeast corner.
113	12	40.00		866	" $\frac{1}{4}$ post.
	13	80.00		874	" northeast corner.
	24	80.00		880	" "
	36	40.00		856	" $\frac{1}{4}$ post.
	36	68.70		850	Lillaboo lake, south side.
114	13	0.70		850	" north side.
	13	80.00		861	Ground at northeast corner.
	25	49.20		775	Creek, flowing from Lillaboo lake.
	36	36.30		729	Creek, flowing northwest to lake Athabaska.
	36	80.00		734	Ground at northeast corner.
	115	1	14.90		698
1		78.00		724	Ground at witness mound.
12		14.00		718	" "
12		15.60		703	Lake Athabaska, high water mark.
12		65.00		695	" south side, September 9th, 1912.

## ELEVATIONS OF NATURAL FEATURES.

## EIGHTEENTH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 68.

MAH 416

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		2118	Ground at northeast corner.
	35	0.00		2151	" "
	35	40.00		2221	" $\frac{1}{4}$ post.
	34	0.00		2266	" northeast corner.
	33	0.00		2313	" "
	32	0.00		2298	" "
	31	0.00		2287	" "
2	36	0.00		2271	" "
	36	61.00		2235	Medley river, flowing south.
	35	50.00		2320	Ground.
	34	0.00		2313	" at northeast corner.
	33	0.00		2353	" "
	33	70.00		2330	" witness mound.
	32	18.00		2329	Medley river flowing north.
31	0.00		2339	Ground at northeast corner.	
3	36	0.00		2369	" "
	36	14.25		2346	Medley river.
	35	0.00		2383	Ground at northeast corner.
	34	0.00		2445	" "
	34	8.50		2479	" Summit.
	33	0.00		2438	" at northeast corner.
	32	0.00		2460	" "
31	0.00		2384	" "	
4	36	0.00		2382	" "
	35	0.00		2396	" "
	35			2401	" witness mound.
	33	40.00		2390	" $\frac{1}{4}$ post.
	32	0.00		2349	" northeast corner.
	32	30.00		2321	" "
	31	0.00		2342	" at northeast corner.
5	36	2.00		2307	" witness mound.
	35	0.00		2280	" northeast corner.
	34	0.00		2277	" "
	33	0.00		2233	" "
	33	61.20		2227	Lake, emptying to Sand river.
	32	0.00		2278	Ground at northeast corner.
	31	0.00		2277	" "
6	36	0.00		2341	" "
	36	60.00		2371	" Summit.
	34	0.00		2345	" at northeast corner.
	33	0.00		2318	" "
	32	0.00		2284	" "



Photo by L. O. R. Dozors, D.L.S.  
P.B.M.—L 1 on Queen's Avenue school, Edmonton, Alberta.



Photo by L.O. R. Dozors, "D.L.S."  
P.B.M.—H 28 on court-house, Red Deer, Alberta.



LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

EIGHTEENTH BASE LINE WEST OF FOURTH MERIDIAN.

MAP 416

NORTH BOUNDARY OF TOWNSHIP 68.

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
6	31	0.00		2181	Ground at northeast corner. Creek.
	31	33.11		2109	
7	36	0.00		2163	Ground at northeast corner.
	35	0.00		2061	
	34	0.00		2060	" "
	34	48.00		2021	" "
	33	4.00		2017	Lake emptying to Sand river.
	32	0.00		2045	Ground at northeast corner.
	31	0.00		2039	" "
	31	50.00		2084	" "
8	36	0.00		2048	" at northeast corner.
	35	15.00		1978	
	35	26.40		1928	Sand river, Depression.
	34	0.00		1944	Ground at northeast corner.
	34	40.00		2057	" 1/4 post.
	33	26.50		2108	Creek.
	32	0.00		2158	Ground at northeast corner.
	31	0.00		2341	" "
	31	40.00		2323	" 1/4 post.
	9	36	0.00		2362
35		0.00		2445	
34		40.00		2545	" "
33		0.00		2590	" 1/4 post.
33		39.50		2515	" northeast corner.
32		0.00		2557	Creek.
32		18.25		2494	Ground at northeast corner.
31		10.50		2655	Creek.
					Ground Summit.
10	36	0.00		2582	Ground at northeast corner.
	36	67.35		2500	
	35	20.00		2665	Creek, flowing south to Touchwood lake,
	34	0.00		2452	Ground, highest point on this line.
	33	0.00		2504	Ground at northeast corner.
	32	0.00		2319	" "
	32	40.00		2254	" "
	31	0.00		2047	" 1/4 post.
31	49.50		2030	" northeast corner.	
				Creek, flowing north to Heart lake.	
11	36	0.00		2125	Ground at northeast corner.
	35	0.00		2008	
	34	19.00		2130	Ground at northeast corner.
	34	36.00		2059	" Summit.
	33	0.00		2014	Crossing of road to MacMurray.
	32	0.00		1998	Ground at northeast corner.
31	0.00		1956	" "	

## ELEVATIONS OF NATURAL FEATURES.

## EIGHTEENTH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 68.

MAP 416

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
12	36	0.00		1943	Ground at northeast corner.
	35	0.00		1923	" "
	34	26.00		1900	Creek, flowing northeast.
	33	25.00		1916	Small lake south of line.
	33	54.00		2003	Ground.
	32	40.00		1979	" at $\frac{1}{4}$ post.
	31	0.00		1946	" at northeast corner.
	31	55.00		1913	Small lake.
	31	64.00		1947	Ground.
13	36	0.00		1902	Square lake (northerly bay).
				1780	Lac la Biche, estimated.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

NINETEENTH BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 72.

MAP 416

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
1	36	Chs. Lks.	Feet.	
	35	0.00	2198	Ground at northeast corner.
	35	0.00	2187	" "
	34		2174	Foster creek.
	33	0.00	2187	Ground at northeast corner.
	33	0.00	2204	" "
	32	24.00	2221	Creek.
	31	0.00	2259	Ground at northeast corner.
		0.00	2272	" "
2	36	0.00	2323	" "
	35	0.00	2368	" "
	34	0.00	2363	" "
	35	0.00	2353	" "
	32	0.00	2386	" "
	31	0.00	2366	" "
3	36	0.00	2311	" "
	36	40.00	2285	Creek.
	35	0.00	2299	Ground at northeast corner.
	34	0.00	2283	" "
	33	2.00	2276	" at witness mound.
	33	7.00	2277	Underwood lake.
	31	0.00	2289	Ground at northeast corner.
4	36	0.00	2277	" "
	36	21.00	2275	Lake.
	35	16.00	2299	Ground.
	34	0.00	2300	Ground at northeast corner.
	33	0.00	2324	" "
	32	0.00	2321	" "
	32	65.00	2343	" "
5	36	0.00	2309	" at northeast corner.
	35	0.00	2271	" "
	34	0.00	2235	" "
	33	0.00	2232	" "
	32	0.00	2250	" "
	31	0.00	2345	" "
6	36	0.00	2321	" "
	36	37.00	2325	Lake.
	34	0.00	2314	Ground at northeast corner
	33	17.15	2333	" "
	32	0.00	2306	" at northeast corner
	31	0.00	2368	" "
7	36	0.00	2412	" "

## ELEVATIONS OF NATURAL FEATURES.

## NINETEENTH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 72.

MAP 416

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
7	35	0.00		2403	Ground at northeast corner.
	34	0.00		2344	" "
	33	0.00		2286	" "
	32	0.00		2225	" "
	32			2222	Ipiatik lake, east side.
	31			2222	" west "
					This lake is source of Sand river.
8	36	0.00		2252	Ground at northeast corner.
	35	0.00		2242	" "
	34	0.00		2271	" "
	33	40.00		2280	" $\frac{1}{4}$ post.
	33	61.30		2252	Creek flowing southwest to Sand river.
	32	0.00		2254	Ground at northeast corner.
	32	20.00		2247	Pond draining to Sand river.
	31	40.00		2287	Ground at $\frac{1}{4}$ post.
9	36	0.00		2252	" northeast corner.
	36	73.50		2233	Pond draining to Clyde river.
	35	0.00		2234	Ground at northeast corner.
	34	0.00		2214	" "
	33	30.23		2201	" "
	33	65.00		2151	Lake, east side.
	31	0.00		2161	Ground at northeast corner.
	31	60.50		2148	Clyde river, flowing northwest.
10	36	0.00		2156	Ground at northeast corner.
	35	0.00		2168	" "
	34	0.00		2177	" "
				2140	Clyde lake, one mile north of line, estimated.
	33	0.00		2180	Ground at northeast corner.
	32	0.00		2190	" "
	31	0.00		2159	" "
	31	42.90		2144	Behan lake, east side.
11	35	10.00		2146	Ground on witness mound on point of land.
	34	27.50		2144	Behan lake, west side.
	33	0.00		2155	Ground at northeast corner.
	33	56.16		2167	" "
	31	0.00		2138	" at northeast corner.
	31	47.95		2089	Clyde river flowing south.
12	36	0.00		2126	Ground at northeast corner.
	35	0.00		2128	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

NINETEENTH BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 72.

MAP 416, 415

Rge.	Sec.	Distance from N.E. Corner.	Elev.	Feature.
12	34	0.00	2085	Ground at northeast corner.
	33	4 25	1967	Logan river flowing south.
	32	0.00	2067	Ground at northeast corner.
	31	0.00	2139	" "
13	36	0.00	2134	" "
	35	0.00	2173	" "
	34	0.00	2143	" "
	33	30.40	2128	Creek flowing south.
	33	40.00	2132	Ground at $\frac{1}{4}$ post.
	32	0.00	2142	" northeast corner.
	31	0.00	2210	" "
14	36	0.00	2142	" "
	35	0.00	2167	" "
	34	0.00	2145	" "
	34	10.45	2145	Pond.
	33	0.00	2141	Ground at northeast corner.
	32	0.00	2099	" "
	31	44.00	1994	Wandering river, east branch.
	31	61.50	1980	" , west "
15	36	0.00	1987	Ground at northeast corner.
	35	0.00	1989	" "
	34	0.00	1924	" "
	33	22.50	1885	Wandering river.
	32	0 00	1886	Ground at northeast corner.
	31	0.00	1879	" "
16	36	1.00	1876	" witness mound.
	36	3.80	1867	Wandering river, flowing north.
	35	0.00	1872	Ground at northeast corner.
	35	35.00	1862	Wandering river, flowing south.
	34	0.00	1875	Ground at northeast corner.
	33	0.00	1883	" "
	32	0.00	1899	" "
	31	0.00	1882	" "
	31	30.86	1869	Creek flowing north.
17	36	0.00	1882	Ground at northeast corner.
	35	0.00	1941	" "
	35	61.50	1832	Wandering river, flowing south to La Biche river.
	34	0.00	1843	Ground at northeast corner.
	33	0.00	1866	" "
	32	0.00	1881	" "
	31	0.00	1891	" "

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## NINETEENTH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 72.

MAP 415

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
18	36	0.00		1919	Ground at northeast corner.
	34	0.00		1925	" "
	34	18.50		1827	Creek.
	34	40.00		1913	Ground at $\frac{1}{4}$ post.
	34	79.00		1607	" witness mound.
	34	80.84		1574	Athabaska river, easterly crossing.
	33	67.00		1838	Ground.
	32	40.00		1596	Ground at $\frac{1}{4}$ post.
	32	69.70		1580	Athabaska river, westerly crossing.
	31	0.00		1613	Ground at northeast corner.
	31	40.00		1913	" $\frac{1}{4}$ post.
19	36	0.00		2038	" northeast corner.
	35	0.00		2165	" "
	35	19.58		2158	Creek flowing south to Athabaska river.
	34	0.00		2089	Ground at northeast corner.
	33	0.00		2092	" "
	32	0.00		2115	" "
	32	60.00		2170	" "
20	36	0.00		2167	" at northeast corner.
	35	44.55		2105	Creek flowing southwest to Calling lake.
	33	0.00		2168	Ground at northeast corner.
	32	14.30		2249	" "
	31	6.80		2200	Creek.
21	36	0.00		2174	Ground at northeast corner.
	35	0.00		2138	" "
	34	0.00		2127	" "
	34	32.40		2109	Creek.
	33	0.00		2122	Ground at northeast corner.
	32	0.00		2114	" "
	31	0.00		2096	" "
22	36	0.00		2041	" "
	36	16.42		2011	Creek flowing south.
	36	64.45		1975	Ground.
	36	69.75		1947	Calling lake, high water mark.
	36	69.75		1945	" east side.
23	35	41.75		1945	" west side.
	35	62.00		2058	Ground.
	33	0.00		2181	" at northeast corner.
	33	29.00		2182	Lake, east side.
	32	43.00		2182	" west side.
24	36	0.00		2151	Ground at northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

NINETEENTH BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 72.

MAP 415

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
24	35	0.00	2149	Ground at northeast corner.
	34	0.00	2172	" "
	34	66.07	2236	"
	32	0.48	2171	"
	32	21.15	2154	Lake, east shore.
	32	52.20	2184	Ground.
	31	0.00	2145	" at northeast corner.
	25	36	0.00	2103
36		75.00	2097	Small lake to north of line.
35		8.30	2130	Ground.
34		20.00	2120	"
33		0.00	2156	" at northeast corner.
32		40.00	2165	" $\frac{1}{4}$ post.
26	36	0.00	2088	" northeast corner.
	35	0.00	2066	" "
			2001	Faweett lake, on north side of line.
	34	0.00	2054	Ground at northeast corner.
	34	44.53	2039	Creek.
	33	0.00	2107	Ground at northeast corner.
	32	0.00	2089	" "
	31	0.00	2141	" "
	31		2085	Lake Peter, on fifth meridian.

## ELEVATIONS OF NATURAL FEATURES.

## TWENTIETH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 76.

MAP 466

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
1	36	0.00	1915	Ground at northeast corner.
	35	14.00	1910	" "
	34	0.00	1906	Ground at northeast corner.
	34	0.00	1945	" $\frac{1}{4}$ post.
	33	40.00	1927	" "
	33	79.90	1904	Dillon river.
	32	40.00	1962	Ground at $\frac{1}{4}$ post.
	31	7.80	2024	"
	31	18.65	1979	Creek.
	2	36	0.00	2014
35		0.00	1975	" "
34		22.75	1959	Landels river.
33		0.00	2037	Ground at northeast corner.
33		40.00	2060	" $\frac{1}{4}$ post.
32		0.00	2039	" northeast corner.
31		0.00	2027	" "
31		60.00	2006	"
3	36	35.95	1993	Creek.
	35	0.00	1990	Ground at northeast corner.
	34	0.00	1957	" "
	33	0.00	1981	" "
	32	0.00	1905	" "
	32	40.00	1877	" $\frac{1}{4}$ post.
	32	72.50	1857	Winefred river,
	31	40.00	1883	Ground at $\frac{1}{4}$ post.
4	36	0.00	1891	" northeast corner.
	35	0.00	1892	" "
	34	0.00	1897	" "
	34	46.00	1939	"
			1910	Winefred lake, three miles south of line estimated.
	33	60.25	1869	Creek.
	32	0.00	1908	Ground at northeast corner.
	32	40.00	1917	" $\frac{1}{4}$ post.
	31	0.00	1887	" northeast corner.
	5	36	0.00	1886
36		40.00	1875	" $\frac{1}{4}$ post.
35		0.00	1872	" northeast corner.
34		0.00	1862	" "
34		44.70	1834	Creek flowing to Christina lake.
34		74.32	1843	" "
32		0.00	1886	Ground at northeast corner.
31		0.00	1912	" "

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

TWENTIETH BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 76.

MAP 466

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
5	31		73.00	1924	Ground.
6	36	0.00		1875	" at northeast corner.
	36	61.30		1828	Small lake.
	35	11.00		1819	Christina lake, east side.
	34	0.00		1823	Ground at northeast corner.
	32	0.00		1828	" "
	31	0.00		1836	" "
7	36	0.00		1853	" "
	35	0.00		1840	" "
	34	0.00		1848	" "
	33	0.00		1840	" "
	33	75.00		1819	Lake.
	31	0.00		1870	Ground at northeast corner.
	31	41.20		1832	Creek.
8				1750	Christina river, at its southerly bend, seven miles north of line, estimated.
	36	0.00		1881	Ground at northeast corner.
	35	0.00		2030	" "
	35	47.00		2003	" "
	33	0.00		1963	" at northeast corner.
	32	0.00		1974	" "
9	31	0.00		2013	" "
	36	0.00		2041	" "
	36	40.00		2094	" $\frac{1}{4}$ post.
	35	36.00		2081	Creek flowing to Christina river
	34	0.00		2086	Ground at northeast corner.
	34	79.55		2081	Creek.
	32	0.00		2077	Ground at northeast corner.
	31	0.00		2084	" "
10	31	40.00		2079	" $\frac{1}{4}$ post.
	36	14.10		2023	May river, flowing from Wappau lake.
	36	40.00		2083	Ground at $\frac{1}{4}$ post.
	35	4.32		2106	Creek.
	34	0.00		2216	Ground at northeast corner.
	33	0.00		2242	" "
	32	0.00		2249	" "
11	31	20.00		2228	" "
				2100	Wappau lake, eight miles south of line, estimated.
	36	0.00		2215	Ground at northeast corner.
	35	0.00		2202	" "

## ELEVATIONS OF NATURAL FEATURES.

## TWENTIETH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 75.

MAPS 466, 465

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
11	34	0.00		2194	Ground at northeast corner.
	33	0.00		2189	Lake at northeast corner.
	32	0.00		2181	Ground at northeast corner.
	32	79.00		2161	" witness mound.
12	36	0.00		2167	" northeast corner.
	35	58.10		2163	Creek flowing south.
	33	0.00		2194	Ground at northeast corner.
	32	0.00		2228	" "
	31	0.00		2261	" "
13	32	0.00		2277	" " Summit.
	35	41.96		2169	Creek.
	33	0.00		2252	Ground at northeast corner.
	32	0.00		2221	" "
	31	0.00		2227	" "
14	36	0.00		2198	" "
	35	0.00		2203	" "
	35	40.00		2190	" $\frac{1}{4}$ post.
	34	32.62		2074	House river, near its southerly bend.
	33	4.00		2087	Ground at witness mound.
	32	0.00		2201	" northeast corner.
	31	0.00		2230	" "
15	36	0.00		2213	" "
	36	61.80		2090	Creek, flowing northeast to House river.
	35	0.00		2186	Ground at northeast corner.
	34	0.00		2195	" "
	33	0.00		2224	" "
	33	69.15		2187	Creek (same as in section 36).
16	31	0.00		2257	Ground at northeast corner.
	36	0.00		2348	" "
	35	0.00		2346	" "
	35	67.30		2391	" Summit.
	33	0.00		2318	" at northeast corner.
	32	0.00		2224	" "
	32	32.90		2164	Creek, flowing direct to Athabaska river.
	31	0.00		2224	Ground at northeast corner.
17	36	0.00		2206	" "
	35	21.64		2152	Creek.
	34	0.00		2219	Ground at northeast corner.
	33	0.00		2239	" "
	32	0.00		2073	" "
	31	0.00		2041	" "

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES,  
 TWENTIETH BASE LINE WEST OF FOURTH MERIDIAN,  
 NORTH BOUNDARY OF TOWNSHIP 76

A 465

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
18	36	0.00		1975	Ground at northeast corner.
	35	0.00		1960	" "
	34	0.00		1932	" "
	33	0.00		1913	" "
	32	0.00		1884	" "
	32	47.30		1874	"
	31			1502	Athabaska river, east side. August.
	31			1562	" west side "
	31	38.90		1520	Ground.
	31	47.70		1616	"
19	36	0.00		1852	Ground at northeast corner.
	35	0.00		1845	" "
	34	0.00		1843	" "
	33	0.00		1851	" "
	32	0.00		1861	" "
	31	0.00		1875	" "
20	36	0.00		1871	" "
	35	0.00		1884	" "
	34	40.00		1893	" 1/4 post.
	33	6.00		1897	" witness mound.
	32	0.00		1921	" northeast corner.
	31	0.00		1938	" "
21	36	40.00		2295	" 1/4 post.
	35	0.00		2415	" northeast corner.
	35	67.50		2506	" Summit.
	33	0.00		2376	" northeast corner.
	33	48.00		2305	Creek flowing to Pelican river.
	31	0.00		2383	Ground at northeast corner.
22	36	24.84		2280	Creek.
	35	0.00		2357	Ground at northeast corner.
	35	60.00		2472	"
	34	0.00		2520	" at northeast corner.
	34	28.80		2682	" Summit.
	33	0.00		2499	" at northeast corner.
	32	30.20		2360	Creek.
	31	0.00		2530	Ground at northeast corner.
23	36	0.00		2779	" "
	35	0.00		2965	" "
	34	0.00		2871	" "
	34	40.00		2759	" 1/4 post.
	34	76.50		2623	Creek.
	33	40.00		2716	Ground at 1/4 post.

## ELEVATIONS OF NATURAL FEATURES.

## TWENTIETH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 76.

MAP 465

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
23	32	0.00	2972	Ground at northeast corner.
	32	40.00	2837	" $\frac{1}{4}$ post.
	31	0.00	2761	" northeast corner.
24	36	0.00	2638	" "
	35	26.75	2588	Creek.
	34	0.00	2688	Ground at northeast corner.
	33	0.00	2696	" "
	32	0.00	2772	" "
	31	11.25	2737	Creek, flowing to Sandy lake.
	31	40.00	2792	Ground at $\frac{1}{4}$ post.
25	36	0.00	2948	" northeast corner.
	35	0.00	2875	" "
	35	60.00	2982	Highest elevation on this line.
	34	16.80	2903	Creek flowing to South Wabiskaw lake.
	33	0.00	2725	Ground at northeast corner.
	32	0.00	2585	" "
	32	40.00	2663	" $\frac{1}{4}$ post.
	31	0.00	2758	" northeast corner.
26	36	0.00	2808	" "
	35	0.00	2743	" "
	35	64.85	2677	Creek.
	34	40.00	2753	Ground at $\frac{1}{4}$ post.
	33	0.00	2864	" northeast corner.
	32	0.00	2785	" "
	32	34.92	2871	" fifth meridian.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

TWENTY-FIRST BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 80.

MAP 466

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		1722	Ground at fourth meridian.
	35	0.00		1721	" northeast corner.
	35	42.44		1706	Creek flowing to Newby river.
	34	0.00		1791	Ground at northeast corner.
	33	0.00		1669	" "
	32	0.00		1706	" "
	32	37.15		1648	Creek flowing to Newby river.
	31	0.00		1682	Ground at northeast corner.
	2	36	0.00		1672
35		0.00		1639	" "
35		44.50		1614	Creek.
34		0.00		1659	Ground at northeast corner.
33		0.00		1659	" "
32		0.00		1623	" "
32				1500	Landels river at confluence with Winefred river, one mile south of line, estimated.
31		0.00		1495	Ground at northeast corner.
31		14.00		1489	Winefred river.
3	36	0.00		1580	Ground at northeast corner.
	35	0.00		1628	" "
	35	23.00		1614	Small lake.
	34	0.00		1609	Ground at northeast corner.
	33	0.00		1495	" "
				1500	Cowpar lake, 4 miles south of line, estimated.
	32	0.00		1486	Ground at northeast corner.
	31	0.00		1477	" "
	31	49.10		1456	Cowpar creek.
4	36	0.00		1460	Ground at northeast corner.
	35	0.00		1459	Lake at "
	34	0.00		1457	Ground at "
	33	0.00		1460	" "
	33	20.00		1461	Creek flowing north from Bohn lake.
	32	0.00		1488	Ground at northeast corner.
	31	0.00		1458	Ground at northeast corner.
5	36	0.00		1451	" "
	35	0.00		1457	" "
	35	47.80		1449	Christina river, flowing north, Junc.
	34	0.00		1456	Ground at northeast corner.
	33	0.00		1462	" "
	32	0.00		1491	" "
	31	0.00		1572	" "

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-FIRST BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 80.

MAP 466

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
6	36	0.00		1563	Ground at northeast corner.
	36	31.20		1527	" Prairie" creek.
	35	0.00		1552	Ground at northeast corner.
	34	0.00		1599	" "
	34	40.00		1668	" 1/4 post.
	33	0.00		1710	" northeast corner.
	32	0.00		1662	" "
	32	15.86		1609	" Prairie" creek.
	31	0.00		1658	Ground at northeast corner.
	31	37.35		1646	" Prairie" creek.
7	36	40.00		1744	Ground at 1/4 post.
	36	60.00		1777	" "
	35	0.00		1857	" at northeast corner.
	34	0.00		1955	" "
	33	0.00		1993	" "
	32	0.00		2068	" "
	31	0.00		2067	" "
8	36	0.00		2165	" "
	35	0.00		2222	" "
	34	0.00		2313	" "
	33	0.00		2320	" "
	32	0.00		2381	" "
	32	48.74		2405	Highest elevation on this line.
9	36	0.00		2389	Ground at northeast corner.
	35	0.00		2340	" "
	34	0.00		2319	" "
	33	0.00		2314	" "
	32	0.00		2299	" "
	32	63.40		2276	Christina river (east branch), flowing south. June.
10	31	0.00		2288	Ground at northeast corner.
	36	0.00		2289	" "
	35	0.00		2284	" "
	34	0.00		2281	" "
	33	0.00		2276	" "
	32	0.00		2269	" "
	32	48.25		2270	Small lake. July.
11	31	0.00		2283	Ground at northeast corner.
	36	0.00		2269	" "
	36	80.00		2227	Christina river (west branch), flowing south.
	35	40.00		2264	Ground at 1/4 post.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

TWENTY-FIRST BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 80.

MAP 466, 465

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		<i>Chs. Lks.</i>		
11	34	0.00	2261	Ground at northeast corner.
	34	32.65	2256	Creek flowing to Christina river.
	33	0.00	2271	Ground at northeast corner.
	32	0.00	2279	" "
	31	0.00	2286	" "
12	36	0.00	2294	" "
	36	60.35	2291	Creek. This stream flows southerly and joins Christina river in Tp. 78, R. 10.
	35	0.00	2295	Ground at northeast corner.
	34	0.00	2321	" "
	33	0.00	2341	" "
	32	0.00	2356	" "
	31	0.00	2333	" "
	31	46.50	2299	House river, flowing south, near its source.
13	36	0.00	2307	Ground at northeast corner.
	35	0.00	2291	" "
	34	0.00	2290	" "
	33	0.00	2296	Ground at northeast corner.
	32	0.00	2251	Small lake.
	31	0.00	2275	Ground at northeast corner.
14	36	0.00	2224	" "
	35	0.00	2167	" "
	34	0.00	2129	" "
	34	11.70	2123	Dropoff creek.
	33	0.00	2102	Ground at northeast corner.
	32	0.00	2061	" "
	31	0.00	1966	" "
31	49.65	1925	Creek flowing to Dropoff creek.	
15	36	0.00	1917	Ground at northeast corner.
	35	40.00	1897	" $\frac{1}{4}$ post.
	34	0.00	1891	" northeast corner.
	34	23.52	1872	Dropoff creek.
	33	0.00	1889	Ground at northeast corner.
	33	68.15	1841	Dropoff creek.
	32	0.00	1848	Ground at northeast corner.
	31	0.00	1854	" "
16	36	0.00	1877	" "
	35	40.00	1848	" $\frac{1}{4}$ post.
	35	68.90	1809	Creek flowing to House river.
	34	0.00	1839	" "
	33	0.00	1849	" "

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-FIRST BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 80.

MAP 465

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
16	33-	Chs. Lks. 40.00	Feet. 1832	Ground at $\frac{1}{4}$ post.
	33	65.20	1585	House river.
	32	0.00	1680	Ground at northeast corner.
	32	40.00	1784	" $\frac{1}{4}$ post.
	31	0.00	1794	" northeast corner.
17	36	0.00	1792	" "
	35	0.00	1790	" "
	35	36.26	1777	Creek flowing to Athabaska river.
	34	0.00	1789	Ground at northeast corner.
	33	0.00	1799	" "
	32	0.00	1678	" "
	32	40.00	1407	" $\frac{1}{4}$ post.
	32	46.00	1360	Athabaska river, east side.
	32	69.30	1360	" west "
	31	0.00	1395	Ground at northeast corner.
	31	40.00	1592	" $\frac{1}{4}$ post.
18	36	0.00	1782	" northeast corner.
	35	0.00	1796	" "
	34	0.00	1814	" "
	33	13.00	1841	Ground at witness mound.
	32	0.00	1859	" northeast corner.
	31	0.00	1868	" "
19	36	40.00	1872	" $\frac{1}{4}$ post.
	35	40.00	1873	" "
	34	0.00	1871	" northeast corner.
	34	78.00	1883	" witness mound.
	32	0.00	1895	" northeast corner.
	31	0.00	1903	" "
20	36	0.00	1905	" "
	35	0.00	1898	" "
	35	60.00	1883	Creek flowing to Pelican river.
	34	0.00	1892	Ground at northeast corner.
	33	0.00	1889	" "
	32	0.00	1896	" "
	31	0.00	1900	" "
21	36	20.00	1910	" witness mound.
	35	0.00	1916	" northeast corner.
	34	0.00	1931	" "
	33	0.00	1940	" "
	32	0.85	1942	Creek.
	31	0.00	1971	Ground at northeast corner.



Photo by L. O. R. Dozois, D.L.S.  
P.B.M.—L 5 on school-house, Fort Saskatchewan, Alberta, showing method of holding rod.



Photo by L. O. R. Dozois, D.L.S.  
Headclear used by Precise Level party.

Vertical text along the left edge, likely bleed-through from the reverse side of the page. The text is extremely faint and illegible.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

TWENTY-FIRST BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 80.

MAP 465

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
22	36	10.00		1979	Ground at witness mound.
	35	0.00		1988	" northeast corner.
	34	0.00		1975	" "
	33	0.00		1939	" "
	33	20.00		1932	Small lake.
	32	0.00		1933	Ground at northeast corner.
	32	21.15		1933	Hoole creek, flowing to South Wabiskaw lake.
	31	0.00		1928	Ground at northeast corner.
23	36	20.00		1941	"
	35	0.00		1954	" northeast corner.
	34	0.00		1963	" "
	33	0.00		1972	" "
	32	0.00		1980	" "
	31	0.00		1964	" "
24	36	0.00		1970	" "
	36	32.00		1913	Creek flowing south to Hoole creek.
	35	0.00		1908	Ground at northeast corner.
	34	0.00		1960	" "
	33	0.00		1908	" "
	32	0.00		1923	" "
	31	9.00		1846	" "
				1800	South Wabiskaw lake, four miles south of line, estimated.
25	36	0.00		1869	Ground at northeast corner.
	35	0.00		1858	" "
	34	0.00		1928	" "
	34	40.00		1883	Small lake.
	33	0.00		1866	Ground at northeast corner.
	32	0.00		1807	" "
	32	57.00		1787	North Wabiskaw lake, east side.
	32	76.00		1806	Ground at witness mound on point of land.
				1794	Wabiskaw, ground 350 feet southeast of Revillon's store.
				1826	Wabiskaw, ground 360 feet north of Anglican mission.
26	35	52.50		1787	North Wabiskaw lake, west side.
	34	0.00		1806	Ground at northeast corner.
	33	0.00		1850	" "
	33	8.67		1874	" fifth meridian.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-SECOND BASE LINE WEST OF FOURTH MERIDIAN

## NORTH BOUNDARY OF TOWNSHIP 84.

MAP 516

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
1	36	Chs. Lks. 0.00	1535	Garson lake on fourth meridian.
		5.00	1535	" west side.
		40.00	1542	Ground at $\frac{1}{4}$ post.
		0.00	1559	" northeast corner.
		40.00	1576	" $\frac{1}{4}$ post.
		0.00	1613	" northeast corner.
		0.00	1596	" "
2	36	0.00	1594	" "
		0.00	1580	" "
		0.00	1576	" "
		0.00	1601	" "
		0.00	1470	Gipsy lake, north of line, estimated.
		0.00	1555	Ground at northeast corner.
3	36	0.00	1561	" "
		0.00	1521	" "
		0.00	1503	" "
		55.20	1493	Creek, flowing to Christina river.
		0.00	1495	Ground at northeast corner.
		0.00	1506	" "
4	36	0.00	1420	Gordon lake, north of line, estimated.
		0.00	1547	Ground at northeast corner.
		60.00	1626	" "
		0.00	1691	" at northeast corner.
		76.00	1537	" witness mound.
		0.00	1531	" northeast corner.
		52.50	1473	" "
		65.00	1359	Christina river, flowing north.
			1368	" high water mark.
		0.00	1374	Ground at northeast corner.
		24.20	1462	" "
0.00	1523	" at northeast corner.		
40.00	1473	" $\frac{1}{4}$ post.		
5	36	0.00	1418	" northeast corner.
		1.50	1413	Creek, flowing to Christina river.
		40.00	1489	Ground at $\frac{1}{4}$ post.
		0.00	1511	" northeast corner.
		0.00	1557	" "
		0.00	1564	" "
		0.00	1495	" "
		18.70	1472	Georges creek.
		0.00	1490	Ground at northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

TWENTY-SECOND BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 54.

MAP 316

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
6	36	0.00		1545	Ground at northeast corner.
	35	4.00		1545	" witness mound.
	34	0.00		1605	" northeast corner.
	33	0.00		1627	" "
	32	0.00		1605	" "
	32	35.00		1667	"
	32	60.00		1542	"
7	36	5.00		1521	" at witness mound.
	36	30.63		1523	Creek.
	34	0.00		1613	Ground at northeast corner.
	34	15.75		1582	Lake.
	33	0.00		1647	Ground at northeast corner.
	33	50.00		1642	Creek.
	32	0.00		1713	Ground at northeast corner.
	32	40.00		1823	" 1/4 post.
	31	0.00		1909	" northeast corner.
	31	40.00		1957	" 1/4 post.
31	58.00		2068	"	
8	36	0.00		2114	" at northeast corner.
	36	40.00		2225	" 1/4 post.
	35	0.00		2384	" northeast corner.
	35	69.33		2447	Highest point on this line.
	34	0.00		2434	Ground at northeast corner.
	34	63.50		2323	Creek.
	33	0.00		2346	Ground at northeast corner.
	33	44.13		2151	Surmont creek, flowing to Gregoire lake.
	32	0.00		2341	Ground at northeast corner.
	31	12.00		2380	" witness mound.
9	36	0.00		2416	" northeast corner.
	36	42.50		2367	Creek.
	35	0.00		2414	Ground at northeast corner.
	35	49.62		2413	Lake.
	34	8.70		2428	Ground.
	34	64.00		2357	Creek.
	33	0.00		2395	Ground at northeast corner.
	32	0.00		2343	" "
	32	20.00		2244	"
	32	40.00		2125	" at 1/4 post.
	32	65.00		1940	Creek flowing to Mangingstone river.
	31	0.00		2045	Ground at northeast corner.
	31	4.10		2158	"
31	10.48		2009	Lake.	
31	40.00		2125	Ground at 1/4 post.	

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-SECOND BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 84.

MAPS 516, 515

Rgc.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
10	36	0.00		2159	Ground at northeast corner.
	35	2.00		2021	" witness mound.
	34	0.00		1940	" northeast corner.
	33	0.00		1865	" "
	33	57.70		1849	Hangingstone river.
	32	0.00		1871	Ground at northeast corner.
	31	40.00		1888	" 1/4 post.
11	36	17.00		1869	" witness mound.
	35	0.00		1844	" northeast corner.
	34	0.00		1814	" "
	32	19.00		1774	" witness mound.
	31	0.00		1769	" northeast corner.
12	36	0.00		1753	" "
	36	11.77		1708	Creek flowing to Horse river.
	35	0.00		1742	Ground at northeast corner.
	34	27.90		1765	Creek.
	33	0.00		1790	Ground at northeast corner.
	32	0.00		18c6	" "
	31	0.00		1797	" "
13	36	0.00		1831	" "
	36	41.00		1817	Creek.
	35	0.00		1820	Ground at northeast corner.
	34	0.00		1822	" "
	33	0.00		1806	" "
	32	0.00		1808	" "
	32	30.00		1803	Creek.
	31	0.00		1796	Ground at northeast corner.
14	36	0.00		1776	" "
	35	10.10		1760	Creek.
	34	0.00		1776	Ground at northeast corner.
	34	75.50		1783	Lake.
	33	40.00		1770	Ground at 1/4 post.
	33	55.00		1743	" "
	33	64.31		1677	Horse river.
	32	0.00		1687	Ground at northeast corner.
	32	10.85		1744	" "
	31	77.70		1739	" McMurray road crossing.
15	36	5.00		1739	" at witness mound.
	35	0.00		1734	" at northeast corner.
	34	0.00		1734	" "
	34	55.81		1727	Algar river, east branch.
	32	0.00		1748	Ground at north east corner.
	31	0.00		1720	" "

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

TWENTY-SECOND BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 34.

MAP 515

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
16	36	10.74		1710	Algar river, west branch.
		0.00		1720	Algar lake south of line, estimated.
		0.00		1727	Ground at northeast corner.
		0.00		1729	" "
		0.00		1723	" "
		0.00		1727	" "
17	36	0.00		1700	" "
		0.00		1683	" "
		0.00		1676	" "
		0.00		1650	" "
		37.57		1674	" "
		72.26		1427	" "
		0.00		1275	" at northeast corner.
		21.34		1227	Athabaska river, at foot of Grand Rapids.
		40.00		1315	Ground at 1/4 post.
		61.17		1594	" "
		68.12		1479	Creek.
		0.00		1612	Ground at northeast corner.
		0.00		1693	" "
		40.00		1727	" 1/4 post.
75.25		1592	Creek.		
18	36	20.00		1735	Ground.
		0.00		1789	Ground at northeast corner.
		0.00		1841	" "
		0.00		1846	" "
19	36	0.00		1912	" "
		0.00		1942	" "
		0.00		1957	" "
		0.00		2001	" "
		0.00		2015	" "
		44.00		2012	Creek, flowing to Athabaska river. The line passes through a continuous area of swamp from here to Wabiskaw river. Elevations are given closely to illustrate varying elevations over a swamp.
20	36	0.00		2022	Ground at north east corner.
		40.00		2025	" 1/4 post.
		0.00		2032	" north east corner.
		40.00		2035	" 1/4 post.
		0.00		2036	" north east corner.
		60.00		2042	" Summit.
		40.00		2034	Ground at 1/4 post.

Rge.	Sec.	Distance from N.E. Corner.	Elev.	Feature.
		Chs. Lks.	Feet.	
20	32	0.00	2023	Ground at northeast corner.
	32	60.00	2015	"
	31	0.00	2021	" at northeast corner.
	31	40.00	2020	" $\frac{1}{4}$ post.
21	36	0.00	2022	" northeast corner.
	36	40.00	2024	" $\frac{1}{4}$ post
	35	0.00	2048	" northeast corner, highest elevation between Athabaska river and fifth meridian.
	35	40.00	2029	Ground at $\frac{1}{4}$ post.
	34	0.00	2016	" north east corner.
	34	40.00	2001	" $\frac{1}{4}$ post.
	34	70.10	1992	Wood Buffalo river.
	33	0.00	1999	Ground at northeast corner.
	33	60.00	2011	Ground.
	32	0.00	2004	Ground at northeast corner.
	32	40.00	1990	" $\frac{1}{4}$ post.
	31	0.00	1988	" northeast corner.
	31	53.34	1989	"
	22	36	0.00	1990
36		40.00	2016	" $\frac{1}{4}$ post.
35		0.00	2039	" northeast corner.
34		0.00	2024	" "
34		40.00	2035	" $\frac{1}{4}$ post.
33		0.00	2010	" north east corner.
33		40.00	1990	" $\frac{1}{4}$ post.
32		0.00	1986	" north east corner.
31		0.00	1942	" "
23	36	0.00	1915	" "
	35	0.00	1905	" "
	34	0.00	1897	" "
	33	0.00	1887	" "
	33	60.00	1873	"
	32	0.00	1877	Ground at north east corner.
	32	40.00	1885	" $\frac{1}{4}$ post.
	31	0.00	1882	" northeast corner.
24	36	0.00	1865	" "
	35	0.00	1856	Lake.
	35	5.00	1860	Ground at witness mound.
	35	47.00	1918	" Summit.
	34	0.00	1889	" northeast corner.
	34	40.00	1840	" $\frac{1}{4}$ post.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

TWENTY-SECOND BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 84

MAP 515

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
24	33	0.00		1834	Ground at northeast corner.
	32	0.00		1805	" "
	32	40.00		1797	" $\frac{1}{4}$ post.
				1739	Wabiskaw river, high water mark.
	31	0.00		1734	" January.
	31	40.00		1743	Ground at $\frac{1}{4}$ post.
25	36	0.00		1777	" northeast corner.
	35	0.00		1791	" "
	34	0.00		1797	" "
	33	0.00		1825	" "
	32	20.00		1852	" "
	32	40.00		1757	" $\frac{1}{4}$ post.
	31	0.00		1861	" northeast corner.
26	36	0.00		1896	" "
	35	0.00		1942	" "
	35	40.00		1961	" $\frac{1}{4}$ post.
	35	68.00		1982	" fifth meridian.

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-THIRD BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 88.

MAP 516

Rge.	Sec.	Distance from N.E. Corner.	Elev.	Feature.
1	36	0.00	1608	Ground at northeast corner.
	35	0.00	1611	" "
	35	15.00	1533	"
	35	40.00	1234	" $\frac{1}{4}$ post.
	35	60.00	1077	Creek.
	34	0.00	1249	Ground at northeast corner.
	34	58.00	1266	Creek.
	33	0.00	1433	Ground at northeast corner.
	33	40.00	1586	" $\frac{1}{4}$ post.
	32	0.00	1575	" northeast corner.
	32	14.07	1465	Creek.
	31	0.00	1547	Ground at northeast corner.
	31	29.23	1385	Rattlepan creek.
	2	36	0.00	1435
36		19.00	1559	Ground.
36		45.81	1391	Creek.
35		0.00	1549	Ground at northeast corner.
34		0.00	1561	" "
34		73.00	1573	"
33		14.85	1429	Creek.
33		40.00	1369	Ground at $\frac{1}{4}$ post.
33		79.00	1587	" witness mound.
31		0.00	1553	" northeast corner.
3	36	0.00	1539	" "
	35	0.00	1516	" "
	35	40.00	1434	" $\frac{1}{4}$ post.
	34	0.00	1214	" northeast corner.
	34	15.54	1081	Edwin river.
	34	40.00	1304	Ground at $\frac{1}{4}$ post.
	33	0.00	1512	" northeast corner.
	32	0.00	1523	" "
	32	78.00	1538	" witness mound.
4	36	0.00	1544	" northeast corner.
	34	0.00	1555	" " Summit.
	33	20.00	1542	"
	33		1490	Lake, three miles south of line, estimated.
	32	0.00	1541	Ground at northeast corner.
5	36	0.00	1524	" "
	35	0.00	1529	" "
	34	0.00	1498	" "
	34	66.47	1433	Creek.
	33	0.00	1314	Ground at northeast corner.
	33	8.80	1242	Cottonwood creek.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

TWENTY-THIRD BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 88.

MAP 516

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
5	33	Chs. I.Fc. 26.10	Feet. 1468	Ground.
	32	0.00	1502	" northeast corner.
	32	41.00	1314	" 1/4 post.
	31	40.00	923	" "
6	36	1.45	840	Clearwater river, at mouth of Cottonwood creek.
	36	4.20	851	Ground on island.
	36	40.00	844	" 1/4 post.
	36	72.85	839	Clearwater river.
	35	8.00	947	Ground.
	35	40.00	1142	" 1/4 post.
	34	0.00	1372	" northeast corner.
	33	0.00	1329	" "
	33	40.00	1428	" 1/4 post.
	32	0.00	1436	" northeast corner.
	32	54.00	1402	Creek.
	31	0.00	1368	Ground at northeast corner.
	31	8.00	1435	"
7	36	0.00	1409	" "
	35	0.00	1226	" "
	35	46.70	1276	Creek.
	34	0.00	1364	Ground at northeast corner.
	33	0.00	1342	" "
	32	0.00	1304	" "
	31	0.00	1216	" "
	31	30.96	902	Rainbow creek.
	31	40.00	1091	Ground at 1/4 post.
8	36	0.00	929	" northeast corner.
	35	0.00	837	" "
	34	0.00	831	" "
		61.00	804	Clearwater river. August.
	33	80.00	828	Ground at witness mound.
	32	62.89	800	Clearwater river.
	31	0.00	812	Ground at northeast corner.
	31	40.00	814	" 1/4 post.
9	36	0.00	806	" northeast corner.
	36	28.00	798	Clearwater river.
	36	60.00	821	Ground.
	35	0.00	942	" at northeast corner.
	35	40.00	1189	" 1/4 post.
	35	77.00	982	Saline creek.
	34	40.00	1169	Ground at 1/4 post.

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-THIRD BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 88.

MAPS 516, 515

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
9	34	80.00	921	Hangingsstone river.	
	33	7.00	1041	Ground.	
	33	40.00	1187	" at $\frac{1}{4}$ post.	
	32	59.90	1175	"	
				795	Athabaska river at McMurray, 3 miles north of line, estimated.
	31	0.00	970	Ground at northeast corner.	
	31	6.34	901	Horse river.	
10	36	0.00	1192	Ground at northeast corner.	
	35	0.00	1202	" "	
	35	68.50	1218	"	
	34	2.00	986	Top of tar sand cut bank on east side.	
	34	46.10	817	Athabaska river, west side. September.	
	34	69.00	1067	Ground.	
	33	0.00	1236	" at northeast corner.	
	33	65.65	1135	Creek.	
	32	0.00	1250	Ground at northeast corner.	
	31	0.00	1271	" "	
11	36	0.00	1298	" "	
	34	0.00	1382	" "	
	33	0.00	1403	" "	
	32	0.00	1446	" "	
	31	0.00	1472	" "	
12	36	0.00	1499	" "	
	35	2.00	1512	" witness mound.	
	34	0.00	1525	" northeast corner.	
	32	0.00	1555	" "	
13	36	0.00	1588	" "	
	34	6.00	1605	Water in swamp, source of Mountain creek.	
	32	0.00	1616	Ground at northeast corner.	
14	36	0.00	1624	" "	
	34	0.00	1640	" "	
	32	10.00	1636	Water in swamp.	
15	36	0.00	1662	Ground at northeast corner.	
	35	40.00	1698	" $\frac{1}{4}$ post.	
	34	0.00	1755	" northeast corner.	
	33	0.00	1768	" Summit.	
	32	0.00	1749	" "	
16	36	0.00	1746	" "	

ELEVATIONS OF NATURAL FEATURES.

TWENTY-THIRD BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 88.

MAP 515

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
16	34	0.00		1760	Ground at northeast corner.
	33	3.00		1712	Ground.
	32	0.00		1664	" at northeast corner.
	31	70.00		1619	Creek, flowing north to McKay river.
17	36	0.00		1625	Ground at northeast corner.
	35	0.00		1650	" "
	34	0.00		1631	" "
	33	14.70		1581	Creek, flowing north to McKay river.
	32	0.00		1580	Ground at northeast corner, lowest point between valleys of Athabaska and Peace rivers.
	31	0.00		1581	Ground at northeast corner.
18	36	0.00		1585	" "
	34	0.00		1595	" "
	32	0.00		1604	" "
19	36	0.00		1630	" "
	34	0.00		1640	" "
	32	0.00		1665	" "
20	36	0.00		1681	" "
	36	43.10		1667	McKay river.
	3	0.00		1687	Ground at northeast corner.
	32	0.00		1722	" "
	31	0.00		1697	Lake.
21	36	0.00		1725	Ground at northeast corner.
	35	21.00		1721	Lake.
	33	0.00		1731	Ground at northeast corner. Height of land between Athabaska and Peace rivers.
	32	0.00		1712	Ground at northeast corner.
22	36	0.00		1696	" "
	35	0.00		1680	Creek, flowing to Wabiskaw river.
	34	0.00		1689	Lake.
	33	0.00		1708	Ground at northeast corner.
	32	0.00		1694	" "
	32	0.00		1672	" "
23	36	0.00		1699	" "
	35	0.00		1696	" "
	34	40.00		1648	" $\frac{1}{4}$ post.
	34	73.50		1606	Wabiskaw river.
	33	0.00		1633	Ground at northeast corner.
	32	0.00		1672	" "
	32	0.00		1672	" "

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-THIRD BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 68.

MAP 515

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
24	36	0.00	1683	Ground at northeast corner.
	34	0.00	1715	" "
	33	0.00	1773	" "
	32	0.00	1868	" "
	31	0.00	1940	" "
Elevations taken along trial line.				
25	36	10.00	2013	Ground.
	36	40.00	2050	" at $\frac{1}{4}$ post.
	35	0.00	2024	" northeast corner.
	34	0.00	2064	" "
	34	33.00	2117	"
	33	0.00	2094	" at northeast corner
	33	40.50	1986	Creek.
	33	62.00	2134	Ground.
	32	3.00	2259	"
31	50.00	2339	"	
26	36		2312	Ground at fifth meridian.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

TWENTY-FOURTH BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 92.

MAP 566

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		1752	Ground at northeast corner.
	35	0.00		1747	" "
	35	57.50		1864	" "
	34	0.00		1801	" northeast corner.
	34	32.00		1917	" "
	33	0.00		1862	" northeast corner.
	33	40.00		1834	" 1/4 post.
	32	0.00		1857	" northeast corner.
	32	28.10		1812	" "
	31	0.00		1895	" northeast corner.
	31	30.00		1818	" "
	31	63.30		1892	" "
2	36	0.00		1864	" northeast corner.
	35	0.00		1776	" "
	35	36.70		1897	" "
	34	0.00		1808	" northeast corner.
	33	0.00		1696	" "
	33	42.00		1756	" "
	32	0.00		1692	" northeast corner.
	31	0.00		1655	" "
	31	40.00		1676	" 1/4 post.
	31	60.40		1625	Creek flowing northwest to Firebag river.
3	36	0.00		1634	Ground at northeast corner.
	35	0.00		1697	" "
	34	0.00		1784	" "
	33	0.00		1845	" "
	33	10.60		1828	Creek flowing east to above creek.
	32	0.00		1987	Ground at northeast corner.
	31	0.00		2069	" "
	31	55.00		2055	Same creek as before.
4	36	0.00		2067	Ground at northeast corner.
	35	0.00		2124	" "
	34	0.00		2146	" "
	33	14.00		2203	Highest point on this line.
	31	0.00		2141	Ground at northeast corner.
5	36	0.00		2126	" "
	35	0.00		2081	" "
	34	1.70		2014	Creek flowing southerly to Clearwater river.
	33	0.00		1954	Ground at northeast corner.
	33	40.00		1853	" 1/4 post.
	32	40.00		1796	" "

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-FOURTH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 92.

MAP 566

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
5	31		35.90	1770	Creek flowing southerly to Clearwater river.
6	36	0.00		1797	Ground at northeast corner.
	35	0.00		1867	" "
	35	43.60		1900	" "
	34	0.00		1860	" northeast corner.
	33	0.00		1875	" "
	32	0.00		1827	" "
	31	0.00		1776	" "
7	31	40.00		1715	" $\frac{1}{4}$ post.
	36	0.00		1691	" northeast corner.
	36	60.00		1670	Water in pond.
	35	0.00		1673	Ground at northeast corner.
	34	0.00		1647	" "
	34	78.37		1618	Steepbank river flowing south.
	34	80.00		1622	Ground at witness mound.
	32	0.00		1624	" northeast corner.
	31	0.00		1622	" "
	31	40.00		1610	" $\frac{1}{4}$ post.
8	36	0.00		1577	" northeast corner.
	35	0.00		1508	" "
	34	0.00		1472	" "
	33	0.00		1442	" "
	33	40.00		1415	" $\frac{1}{4}$ post.
	33	58.73		1371	Creek flowing north.
	32	0.00		1352	Ground at northeast corner.
	31	0.00		1309	" "
	31	25.79		1282	Creek flowing northwest.
	31	40.00		1304	Ground at $\frac{1}{4}$ post.
9	36	0.00		1268	" northeast corner.
	36	22.00		1243	Creek flowing northwest.
	36	40.00		1236	Ground at $\frac{1}{4}$ post.
	35	0.00		1218	" northeast corner.
	35	40.00		1180	" $\frac{1}{4}$ post.
	34	0.00		1175	" northeast corner.
	33	0.00		1161	" "
	33	62.00		1129	Creek flowing northwest.
	33	69.19		1127	Crossing of mining claim survey line.
	32	0.00		1117	Ground at northeast corner.
	32	8.15		1111	Creek flowing northwest.
	32	59.10		1092	" "
	31	0.00		1076	Ground at northeast corner.
	31	9.50		1060	Creek.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES

TWENTY-FOURTH BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 92.

MAP 566

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks.	Feet.	
10	36	0.00	1053	Ground at northeast corner.
	36	15.10	995	Creek.
	36	20.00	1038	Ground.
	36	40.00	962	" at 1/4 post.
	36	60.00	858	"
	36	69.90	823	Creek.
	35	0.00	837	Ground at northeast corner.
	35	14.00	779	"
	35	36.72	772	Athabaska river, east side.
	35	63.42	772	" west "
	34	0.00	778	Ground at northeast corner.
	34	40.00	827	" 1/4 post.
	33	0.00	1003	" northeast corner.
	33	40.00	1041	" 1/4 post.
	32	0.00	1036	" northeast corner.
31	0.00	1029	" "	
11	36	0.00	1023	" "
	36	36.00	964	River flowing north.
	36	40.00	984	Ground at 1/4 post.
	36	48.65	973	Creek flowing northeast.
	35	0.00	1002	Ground at northeast corner.
	35	40.00	1040	" 1/4 post.
	34	0.00	1053	" northeast corner.
	34	31.96	1059	Creek.
	33	0.00	1086	Ground at northeast corner.
	33	40.00	1102	" 1/4 post.
	32	0.00	1116	" northeast corner.
	32	40.00	1134	" 1/4 post.
	32	70.26	1127	Creek flowing north.
	31	0.00	1130	Ground at northeast corner.
	31	0.14	1130	Creek flowing north.
31	40.00	1148	Ground at 1/4 post.	
31	60.00	1152	"	
12	36	0.00	1158	" northeast corner.
	36	57.50	1031	McKay river 126 ft. wide, 6 ft. deep, flowing north.
	35	46.50	1189	Ground.
	34	0.00	1204	Ground at northeast corner.
	33	0.00	1244	" "
	32	0.00	1300	" "
	31	0.00	1400	" "
13	36	0.00	1448	" "
	35	0.00	1492	" "
	34	0.00	1507	" "

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-FOURTH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 02.

MAP (565)

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks.	Feet.	
13	33	0.00	1521	Swamp water at northeast corner.
	32	0.00	1535	Ground at northeast corner.
	31	0.00	1543	" " Summit.
14	36	0.00	1508	" "
	35	0.00	1459	" "
	34	0.00	1426	" "
	34	42.11	1410	Creek, 3 ft. wide, 2 ft. deep, flowing north to Dover river.
	33	0.00	1412	Ground at northeast corner.
	33	60.00	1368	Creek, 10 ft. wide, 5 ft. deep, flowing north to Dover river.
	32	0.00	1414	Ground at northeast corner.
	31	0.00	1422	" "
	31	47.93	1375	Creek, 10 ft. wide, 4 ft. deep, flowing north to Dover river.
	15	36	0.00	1429
35		0.00	1444	" "
35		64.05	1370	Dover river, 70 ft. wide, 5 ft. deep, flowing north. Lowest elevation west of crossing of McKay river.
34		40.00	1445	Ground at $\frac{1}{4}$ post.
33		0.00	1454	" northeast corner.
32		0.00	1468	" "
31		0.00	1489	" "
16		36	0.00	1532
	35	0.00	1553	" "
	34	0.00	1589	" "
	33	0.00	1592	" "
	33	43.70	1541	Dover river, flowing southeast.
	32	0.00	1605	Ground at northeast corner.
	31	0.00	1641	" "
17	36	0.00	1649	" "
	35	0.00	1651	" "
	34	0.00	1656	" "
	33	0.00	1664	" "
	32	0.00	1672	" "
	31	0.00	1681	" "
18	36	0.00	1692	" "
	35	0.00	1710	" "
	34	0.00	1698	" "
	34	54.45	1682	Dunkirk river, 66 ft. wide, 5 ft. deep, Summit. [flowing south.]



Photo by L. O. R. Dozois, D.L.S.  
Moving to a new instrument station.

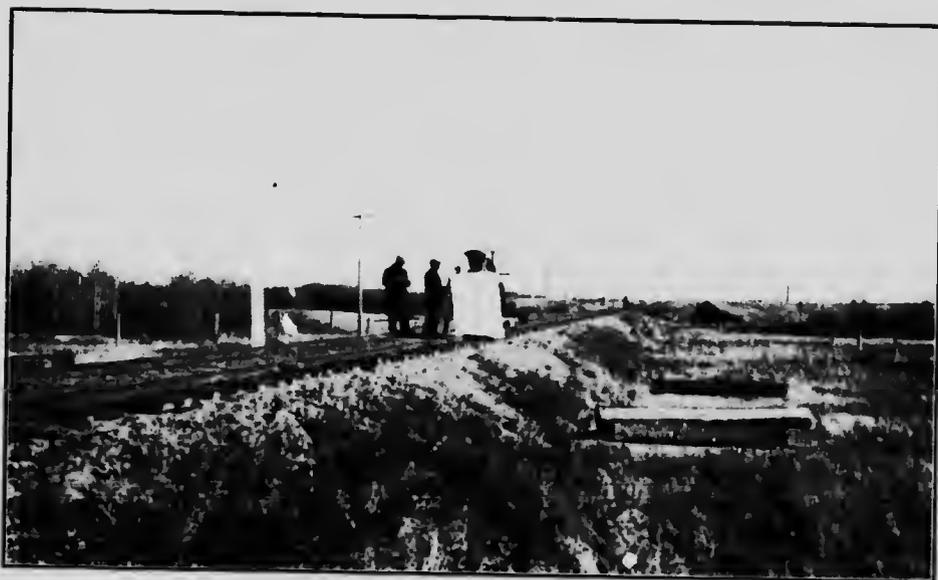


Photo by L. O. R. Dozois, D.L.S.  
Leveler under a bright sun and strong wind.

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LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

TWENTY-FOURTH BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 02.

MAP (365)

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
18	33	0.00	1690	Ground at northeast corner.
	33	33.84	1682	Dunkirk river, flowing north.
	32	0.00	1693	Ground at northeast corner.
	31	0.00	1691	" "
	31	54.30	1682	Dunkirk river, flowing south.
	31	79.00	1689	Ground at witness mound.
19	36	6.58	1682	Dunkirk river, flowing southeast.
	35	0.00	1704	Ground at northeast corner.
	35	15.66	1698	Small lake, east side.
	34	25.96	1707	Ground.
	33	0.00	1717	" at northeast corner.
	32	0.00	1714	" "
	31	0.00	1738	" "
20	36	0.00	1747	" "
	35	0.00	1748	" "
	35	20.00	1752	" Summit.
	34	0.00	1746	" "
	33	0.00	1722	" "
	33	63.15	1717	Creek, 6 ft. wide, 1 ft. deep, flowing south to Chipewyan river.
21	32	0.00	1733	Ground at northeast corner.
	31	60.00	1821	" Summit.
	36	0.00	1783	Ground at northeast corner.
	35	0.00	1821	" "
	34	0.00	1817	" "
	33	0.00	1797	" "
	32	0.00	1849	" "
31	0.00	1916	" "	
22	36	0.00	1954	" "
	35	0.00	1976	" "
	34	0.00	2041	" "
	33	0.00	2050	" "
	32	0.00	2080	" "
	31	0.00	2099	" "
	31	53.43	2139	Highest point on this line west of Athabaska river.
23	36	0.00	2079	Ground at northeast corner.
	35	0.00	2084	" "
	34	0.00	2049	" "
	33	40.00	2067	" 1/4 post.
	32	0.00	2088	" northeast corner.
	31	0.00	2124	" "

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-FOURTH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 92.

MAP (565)

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks. <td>feet. <td></td> </td>	feet. <td></td>	
24	36	0.00	2103	Ground at northeast corner.
	35	0.00	2080	" "
	34	16.90	2017	Small lake, east side.
	33	0.00	1999	Ground at northeast corner.
	33	2.00	1995	Creek, 15 ft. wide, 1 ft. deep, flowing south to Liege river.
	32	0.00	2007	Ground at northeast corner.
	31	0.00	2005	" "
	31	25.23	2043	" "
	31	60.00	1774	Liege river flowing south.
	25	36	20.00	2047
35		0.00	2029	" at northeast corner.
34		0.00	1993	" "
33		0.00	1975	" "
32		0.00	2029	" "
32		76.69	1982	" at fifth meridian.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

TWENTY-FIFTH BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 06.

MAP 566

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks.		
1	36		1737	Ground at fourth meridian, 264 ft. south of northeast corner.
	36	55.40	1778	Highest point on this line, east of Athabaska river.
	35	0.00	1681	Ground at northeast corner.
	34	0.00	1668	" "
	34	67.20	1592	Firebag river, north branch.
	33	0.00	1591	Ground at northeast corner.
	33	59.80	1577	Firebag river, north branch.
	32	0.00	1633	Ground at north east corner.
	32	21.00	1598	Lake.
	32	77.20	1590	Creek.
	31	5.00	1592	Ground at witness mound.
	31	60.41	1590	Trout creek, flowing to Firebag river.
	2	36	0.00	1594
35		0.00	1608	" "
34		0.00	1598	" "
33		0.00	1590	" "
32		0.00	1591	" "
31		0.00	1630	" "
3	36	1.50	1610	Ground at witness mound.
	36	5.00	1610	Lake.
	35	0.00	1612	Ground at northeast corner.
	34	0.00	1620	" "
	33	0.00	1603	" "
	33	58.55	1570	Creek.
	32	0.00	1572	Ground at northeast corner.
	32	9.85	1555	Creek.
	31	0.00	1536	Ground at northeast corner.
4	36	0.00	1519	" "
	35	0.00	1502	" "
	35	40.00	1486	" $\frac{1}{4}$ post.
	34	0.00	1469	" north east corner.
	33	0.00	1427	" "
	33	27.09	1401	Firebag river.
	32	0.00	1403	Ground at northeast corner.
	32	18.15	1402	Creek.
	31	0.00	1420	Ground at northeast corner.
	5	36	0.00	1409
35		0.00	1413	" "
35		30.50	1341	Creek flowing north to Firebag river.
35		40.00	1397	Ground at $\frac{1}{4}$ post.
34		0.00	1385	" northeast corner.

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-FIFTH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 26.

MAP 566

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		<b>Chs. Lks.</b>		
5	34	43.30	1357	Creek.
	33	0.00	1371	Ground at northeast corner.
	33	5.34	1367	Creek.
	32	0.00	1341	Water at northeast corner.
	32	2.50	1350	Ground at witness mound.
	32	22.28	1323	Creek.
	32	56.69	1304	"
	31	0.00	1303	Ground at northeast corner.
	31	19.60	1279	Creek.
6	36	0.00	1264	Ground at northeast corner.
	36	76.30	1237	Creek.
	35	0.00	1239	Ground at northeast corner.
	35	12.21	1235	Creek.
	34	0.00	1239	Ground at northeast corner.
	34	59.75	1208	Creek flowing north to Firebag river.
	33	0.00	1205	Ground at northeast corner.
	32	0.00	1214	" "
	31	0.00	1232	" "
7	36	0.00	1254	" "
	35	0.00	1250	" "
	34	0.00	1216	" "
	33	0.00	1206	" "
	32	0.00	1134	" "
	31	0.00	1097	" "
8	36	0.00	1056	" "
	35	0.00	1027	" "
	35	16.20	1001	Muskeg river, south branch.
	35	72.84	995	Creek.
	34	0.00	992	Ground at northeast corner.
	33	0.00	977	" "
	33	32.87	975	Creek.
	33	80.48	972	"
	32	0.00	972	Ground at northeast corner.
	32	5.00	968	Creek.
	31	0.00	961	Ground at northeast corner.
31	51.80	949	Muskeg river, flowing southwest, lowest elevation except Athabaska valley.	
9	36	0.00	957	Ground at northeast corner.
	35	7.50	955	" witness mound.
	35	40.00	1094	" $\frac{1}{4}$ post.
	34	0.00	1106	" northeast corner.
	33	0.00	1133	" "
	32	0.00	1096	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

TWENTY-FIFTH BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 96.

MAP 566

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
9	31	0.00		1127	Ground at northeast corner.
	31	40.00		1156	" $\frac{1}{4}$ post.
10	36	0.00		1144	" northeast corner.
	35	0.00		1142	" "
	34	0.00		1156	" "
	34			1168	" Summit.
	33	0.00		1144	" at northeast corner.
	33	65.00		1142	" "
	32	0.00		1068	" at northeast corner.
	32	40.00		1000	" $\frac{1}{4}$ post.
	31	0.00		939	" northeast corner.
	31	1.98		938	Creek.
11	36	0.00		947	Ground at northeast corner.
	36	40.00		867	" $\frac{1}{4}$ post.
	36	55.06		755	Athabaska river, east side.
	35	3.45		755	" west side.
	35	11.50		768	Ground at witness mound.
	35	20.00		834	" "
	34	0.00		888	" northeast corner.
	33	0.00		917	" "
	33	7.61		911	Creek.
	32	0.00		955	Ground at northeast corner.
	32	68.84		957	Creek flowing south to Tar river.
	31	0.00		990	Ground at northeast corner.
	31	7.21		966	Creek.
12	36	0.00		1028	Ground at northeast corner.
	36	4.34		1010	Creek flowing south to Tar river.
	35	0.00		1052	Ground at northeast corner.
	34	0.00		1105	" "
	33	0.00		1153	" "
	32	0.00		1227	" "
	31	0.00		1314	" "
	31	32.00		1339	" "
	31			1277	Top of east bank of Tar river.
	31	53.60		1270	Tar river, 18 ft. wide, 1 ft. deep, flowing southeast.
	13	36	0.00		1375
35		0.00		1437	" "
35		59.70		1475	Creek, 5 ft wide, 1 ft. deep, flowing south to Tar river.
34		0.00		1514	Ground at northeast corner.
34		8.40		1510	Creek, 4 ft. wide, 1 ft. deep, flowing south to Tar river.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-FIFTH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 06.

MAP (565)

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
13	33	0.00	1593	Ground at northeast corner.
	33	18.25	1606	Creek, 3 ft. wide, 1 ft. deep, flowing south to Tar river.
	32	0.00	1706	Ground at northeast corner.
	32	54.28	1814	Creek, 3 ft. wide, 1 ft. deep, flowing south to Tar river.
	31	0.00	1881	Ground at northeast corner.
	14	36	18.70	2052
36		56.40	1885	Creek, 6 ft. wide, 1 ft. deep, flowing south to Joslyn creek.
36		60.00	1943	Ground.
35		43.00	1834	Joslyn creek, 15 ft. wide, 1 ft. deep.
34		0.00	1981	Ground at northeast corner
33		0.00	2106	" " Summit.
32		2.00	2090	" witness mound.
32		78.63	2084	Creek, 6 ft. wide, 1 ft. deep, flowing south to Chelsea creek.
31		0.00	2086	Ground at northeast corner.
15		36	0.00	2082
	35	1.00	2123	" witness mound.
	34	0.00	2148	" northeast corner.
	34	78.18	2144	Chelsea creek, 10 feet wide, 1 ft. deep.
	33	0.00	2148	Ground at northeast corner.
	32	2.00	2245	" witness mound.
	32	4.95	2239	Creek, 3 ft. wide, 1 ft. deep, flowing south to Chelsea creek.
	31	0.00	2294	Ground at northeast corner.
16	36	0.00	2347	" "
	34	0.00	2454	" "
	33	0.00	2416	" "
	32	0.00	2290	" "
	32	29.50	2162	Namur river, 100 ft. wide, 4 ft. deep,
	31	0.00	2285	Ground at northeast corner.
17	36	0.00	2400	" "
	36	0.72	2401	Creek, 10 ft. wide, 1 ft. deep, flowing north to Namur river.
	35	2.00	2465	Ground at witness mound.
	34	0.00	2634	" northeast corner.
	34	24.43	2689	" Summit.
	33	20.00	2450	"
	33	36.13	2375	Namur lake, area about 12 square miles, east side.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

TWENTY-FIFTH BASE LINE WEST OF FOURTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 06.

MAP (565)

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.	
18		Chs. Iks.			
	36	0.00	2486	Ground at northeast corner.	
	35	0.00	2553	" "	
	34	0.00	2523	" "	
	33	0.00	2537	" "	
	32	0.00	2630	" "	
	32	40.00	2685	" 1/4 post. Summit.	
	31	46.00	2594	Legend lake, area about 20 square miles, east side.	
		35	16.00	2599	Ground at witness mound.
		35	60.00	2642	" Summit.
		34	0.00	2601	" northeast corner.
		33	8.00	2529	"
		33	55.00	2508	Small lake, area about 75 acres, east side
		32	21.40	2508	Creek, 66 ft. wide, 4 ft. deep, flowing west to M <sup>ik</sup> kwa river.
	31	0.00	2573	Ground at northeast corner.	
20	36	3.00	2464	" witness mound.	
	35	0.00	2458	" at northeast corner.	
	33	0.00	2379	" "	
	32	0.00	2272	" "	
	32	51.00	2231	Mikkwa river, 28 ft. wide.	
	31	0.00	2243	Ground at northeast corner.	
21	36	0.00	2288	" "	
	35	0.00	2326	" "	
	34	0.00	2375	" "	
	33	0.00	2507	" "	
	32	0.00	2455	" "	
	31	0.00	2504	" "	
	31	60.00	2520	" "	
22	36	19.98	2518	Ground.	
	36	55.00	2481	Creek, 2 ft. wide, 1 ft. deep, flowing north.	
	35	0.00	2533	Ground at northeast corner.	
	34	0.00	2612	" "	
	33	0.00	2630	" "	
	32	0.00	2669	" "	
	32	80.50	2648	" witness mound.	
	31	49.61	2650	Creek, 2 ft. wide, 1 ft. deep, flowing south to Liege river.	
23	36	0.00	2667	Ground at northeast corner.	
	35	0.00	2673	" "	
	34	0.00	2689	" "	

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-FIFTH BASE LINE WEST OF FOURTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 96.

MAP (565)

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		<b>Chs. Lks.</b>	<b>Feet.</b>	
23	33	0.00	2673	Ground at northeast corner.
	32	0.00	2713	" "
	31	0.00	2718	" "
24	36	25.36	2795	Highest point on this line.
	35	0.00	2784	Ground at northeast corner.
	34	0.00	2764	" "
	33	0.00	2688	" "
	33	5.30	2677	Lake, east side, area about 60 acres.
	32	0.00	2630	Ground at northeast corner.
	31	0.00	2472	" "
25	36	0.00	2384	" "
	35	0.00	2432	" "
	34	0.00	2396	" "
	33	0.00	2335	" "
	33	43.91	2280	" fifth meridian.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

FIFTH MERIDIAN.

MAPS 414, 464

Tp.	Sec.	Distance from SE. Corner.	Elev.	Feature.
71	25	Chs. Lks. 4.70	1798	Athabaska river, north side.
	25	80.00	2068	Ground at northeast corner.
	36	80.00	2083	" "
72	12	80.00	2121	" "
	13	80.00	2116	" "
	24	80.00	2161	" "
	25	40.00	2173	" 1/4 post.
	36	62.20	2084	Lake Peter, south side.
73	1	19.00	1999	Ground.
	1	80.00	2031	" at northeast corner.
	12	2.00	2001	Fawcett lake, south side.
	12	80.00	2038	Ground at northeast corner.
	13	80.00	2070	" "
	24	19.00	2133	" "
	24	80.00	2018	" at northeast corner.
	25	37.80	2018	Howard lake, south side.
	25	80.00	2029	Ground at northeast corner.
36	80.00	2121	" "	
74	1	80.00	2187	" "
	12	80.00	2051	" "
	13	80.00	2372	" "
	24	80.00	2432	" "
	25	40.00	2480	" 1/4 post.
	25	80.00	2491	" northeast corner.
	36	80.00	2521	" "
75	1	28.50	2461	Creek.
	1	80.00	2536	Ground at northeast corner.
	12	80.00	2605	" "
	13	80.00	2687	" "
	24	80.00	2855	" "
	25	59.00	3042	" "
	25	80.00	3113	" at northeast corner, highest elevation on meridian, north of Athabaska river.
36	80.00	2981	Ground at northeast corner.	
76	1	40.00	2908	Ground at 1/4 post.
	1	80.00	2901	" northeast corner.
	12	79.00	2924	" witness mound.
	13	41.00	2844	Creek.
	13	80.00	2793	Ground at northeast corner.
	24	40.00	2741	" 1/4 post.
	24	80.00	2777	" northeast corner.
	25	19.00	2712	" "

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## FIFTH MERIDIAN.

MAPS 464, (514)

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
76	25	55.00	2818	Ground.	
	25	80.00	2686	"	northeast corner.
	36	3.00	2641	Creek.	
	36	40.00	2851	Ground at $\frac{1}{4}$ post.	
	36	80.00	2871	"	northeast corner.
77	1	40.00	2722	"	$\frac{1}{4}$ post.
	1	80.00	2593	"	northeast corner.
	12	80.00	2428	"	"
	13	57.00	2281	Creek.	
	13	80.00	2302	Ground at northeast corner.	
	24	80.00	2158	"	"
	25	80.00	2102	"	"
	36	80.00	2072	"	"
78	1	80.00	1974	"	"
	12	80.00	1951	"	"
	13	80.00	1923	"	"
	24	80.00	1914	"	"
	25	76.68	1876	Willow river (April).	
	25	80.00	1888	Ground at northeast corner.	
	36	80.00	1934	"	"
79	1	80.00	1952	"	"
	12	80.00	1941	"	"
	13	80.00	1909	"	"
	24	80.00	1890	"	"
	25	80.00	1868	"	"
	36	62.50	1856	Lake, south side.	
	36	80.00	1857	Ground at northeast corner.	
80	1	80.00	1878	"	"
	12	10.20	1804	Lake, south side.	Depression.
	12	40.00	1884	Ground at $\frac{1}{4}$ post.	
	12	80.00	1875	"	northeast corner.
	13	80.00	1882	"	"
	24	70.57	1818	Creek.	
	25	80.00	1866	Ground at northeast corner.	
	36	80.00	1874	"	"
81	1	53.00	1894	"	Summit.
	12	73.30	1827	"	
	12	80.00	1873	"	northeast corner.
	13	80.00	1883	"	"
	24	80.00	1880	"	"
	25	80.00	1848	"	"
	36	80.00	1845	"	"

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

FIFTH MERIDIAN.

MAP (514)

Tp.	Sec.	Distance from SE. Corner.	Elev.	Feature.
		Chs. Lks.		
82	1	80.00	1841	Ground at northeast corner.
	12	80.00	1829	" "
	13	80.00	1820	" "
	25	11.00	1805	Creek.
	25	80.00	1830	Ground at northeast corner.
	36	80.00	1809	" "
83	1	46.40	1771	Muskwa river.
	1	80.00	1858	Ground at northeast corner.
	12	80.00	1834	" "
	13	80.00	1814	" "
	24	80.00	1829	" "
	25	80.00	1846	" "
	36	80.00	1851	" "
84	1	80.00	1857	" "
	12	80.00	1850	" "
	13	39.50	1800	Trout river.
	13	80.00	1853	Ground at northeast corner.
	24	22.90	1835	Creek.
	24	80.00	1911	Ground at northeast corner.
	25	80.00	1933	" "
	36	80.00	1982	" "
85	1	80.00	2022	" "
	12	80.00	2049	" "
	13	80.00	2042	" "
	24	80.00	2023	" "
	25	8.50	2016	Teepee lake, south side (June).
	36	60.00	2016	" north "
	36	80.00	2060	Ground at northeast corner.
86	1	80.00	2072	" "
	12	80.00	2072	" "
	13	80.00	2050	" "
	24	80.00	2139	" "
	25	40.00	2179	" 1/4 post.
	25	80.00	2196	" northeast corner.
	36	40.00	2195	" 1/4 post.
87	1	21.00	2170	" "
	1	80.00	2238	" northeast corner.
	12	80.00	2155	" "
	13	40.00	2205	" 1/4 post.
	13	80.00	2199	" northeast corner.
	24	2.10	2181	Creek.
	24	59.00	2250	Ground.
	24	80.00	2210	" at northeast corner.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## FIFTH MERIDIAN.

MAPS (514), (564)

Td.	Sec.	Distance from SE. Corner.	Elev.	Feature.
87	25	Chs. Lks. 80.00	Feet. 2195	Ground at northeast corner.
	36	80.00	2191	" "
88	1	26.73	2152	Woodenhouse river.
	12	19.00	2333	Ground.
	12	80.00	2271	" at northeast corner.
	13	22.00	2280	"
	13	80.00	2192	" at northeast corner.
	24	20.20	2160	Corn creek.
	24	80.00	2355	Ground at northeast corner.
	25	17.00	2344	Lake, south side.
	25	80.00	2385	Ground at northeast corner.
	36	20.00	2394	Ground, summit.
36	80.00	2312	Ground at northeast corner.	
89	1	80.00	2380	" "
	12	32.35	2327	Creek.
	12	80.00	2367	Ground at northeast corner.
	13	61.00	2392	" Summit.
	13	80.00	2358	" north east corner.
	24	80.00	2233	" "
	25	80.00	2016	" "
36	80.00	1961	" "	
90	1	80.00	1960	" "
	12	47.35	1876	Creek.
	12	80.00	1901	Ground at northeast corner.
	13	80.00	1939	" "
	24	80.00	1915	" "
	25	80.00	1817	" "
	36	80.00	1797	" "
91	1	40.00	1682	" $\frac{1}{4}$ post.
	1	60.00	1585	Wabiskaw river.
	1	79.00	1649	Ground at witness mound.
	12	23.00	1776	"
	12	80.00	1729	" north east corner.
	13	80.00	1774	" "
	24	80.00	1778	" "
	25	80.00	1777	" "
	36	80.00	1790	" "
92	1	78.65	1763	House creek.
	1	80.00	1769	Ground at north east corner.
	12	80.00	1823	" "
	13	80.00	1847	" "
	25	80.00	1898	" "

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

FIFTH MERIDIAN.

MAPS (564), (614)

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
92	36	80.00	80.00	1982	Ground at north east corner.
93	1	80.00		2051	" "
	12	80.00		2160	" "
	13	80.00		2258	" "
	24	80.00		2321	" "
	25	59.50		2364	" "
	25	80.00		2335	" northeast corner.
	36	55.50		2393	" "
94	36	80.00		2372	" northeast corner.
	1	59.00		2424	" "
	12	12.60		2371	Creek.
	12	80.00		2553	Ground at northeast corner.
	13	40.00		2639	" 1/4 post, summit.
	24	80.00		2575	" northeast corner.
	25	80.00		2530	" "
95	36	80.00		2444	" "
	1	46.77		2416	Hay creek.
	1	80.00		2451	Ground at northeast corner.
	12	80.00		2574	" "
	13	80.00		2610	" "
	24	80.00		2770	" "
	25	40.00		2777	" 1/4 post., summit.
96	36	80.00		2650	" northeast corner.
	1	80.00		2618	" "
	12	80.00		2539	" "
	13	57.80		2337	Panny river.
	13	80.00		2437	Ground at northeast corner.
	24	80.00		2478	" "
	25	80.00		2402	" "
97	36	80.00		2280	" "
	1	80.00		2301	" "
	12	80.00		2244	" "
	13	40.00		2128	" 1/4 post.
	13	80.00		2210	" northeast corner.
	24	76.70		2090	Sputina river.
	24	80.00		2122	Ground at northeast corner.
	25	47.10		2076	Creek.
98	25	80.00		2117	Ground at northeast corner.
	36	80.00		2110	" "
	1	80.00		2129	" "
	13	10.00		2078	" witness mound.
	13	80.00		1979	" northeast corner.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

MAP (614)

## FIFTH MERIDIAN.

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
98	24	80.00		1921	Ground at northeast corner.
	25	80.00		1899	" "
	36	80.00		1837	" "
99	1	80.00		1771	" "
	12	22.00		1712	Pond.
	12	62.00		1718	Mikkwa river.
	12	80.00		1788	Ground at northeast corner.
	13	80.00		1823	" "
	24	40.00		1870	" $\frac{1}{4}$ post.
	24	80.00		1853	" northeast corner.
	25	10.30		1815	Elliott river.
	25	80.00		1898	Ground at northeast corner, Summit.
36	80.00		1882	" "	
100	1	48.10		1818	Creek.
	1	80.00		1855	Ground at northeast corner.
	12	80.00		1822	" "
	13	80.00		1765	" "
	24	80.00		1759	" "
	25	80.00		1703	" "
	36	80.00		1617	" "
101	1	80.00		1566	" "
	12	80.00		1528	" "
	13	80.00		1493	" "
	24	80.00		1435	" "
	25	45.15		1393	Burnt river. August.
	25	80.00		1426	Ground at northeast corner.
36	80.00		1384	" "	
102	1	77.50		1338	Lake, south side.
	12	80.00		1299	Ground at northeast corner.
	13	80.00		1272	" "
	24	80.00		1246	" "
	25	80.00		1226	" "
	36	80.00		1209	" "
103	1	80.00		1173	" "
	12	80.00		1136	" "
	13	80.00		1107	" "
	24	80.00		1077	" "
	25	80.00		1061	" "
	36	80.00		1038	" "
104	1	47.00		919	Birch river.
	12	40.00		923	Ground at $\frac{1}{4}$ post.
	12	80.00		999	" northeast corner.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

FIFTH MERIDIAN.

MAP 664

Tp.	Sec.	Distance from SE. Corner.		Elv.	Feature.
		Chs.	Lks.		
104	13	80.00		967	Ground at northeast corner.
	24	80.00		947	" "
	25	80.00		918	" "
	36	80.00		899	" "
105	1	80.00		878	" "
	12	80.00		858	" "
	13	80.00		839	" "
	24	80.00		822	" "
	25	80.00		819	" "
	36	80.00		815	" "
106	1	4.00		810	Birch river, westerly bend.
	1	80.00		810	Ground at north-east corner.
	12	80.00		800	" "
	13	80.00		800	" "
	24	80.00		795	" "
	25	80.00		793	" "
	36	80.00		791	" "
107	1	10.47		790	Harper creek.
	1	80.00		793	Ground at northeast corner.
	12	80.00		791	" "
	13	80.00		792	" "
	24	80.00		795	" "
	25	11.10		791	Nanuche lake, south side.
	25	80.00		793	Ground at northeast corner.
	36	80.00		801	" "
108	1	80.00		817	" "
	12	80.00		821	" "
	13	80.00		819	" "
	24	9.50		816	Lake, south side.
	24	80.00		819	Ground at northeast corner.
	25	80.00		830	" "
	36	75.00		835	" witness mound.
109	1	80.00		839	" northeast corner.
	12	80.00		838	" "
	13	80.00		836	" "
	24	80.00		855	" "
	25	80.00		827	" "
	36	80.00		825	" "
110	1	80.00		829	" "
	12	80.00		823	" "
	13	80.00		825	" "
	24	70.00		758	River flowing northeast.
					Summit.

## ELEVATIONS OF NATURAL FEATURES.

## FIFTH MERIDIAN.

MAP 664

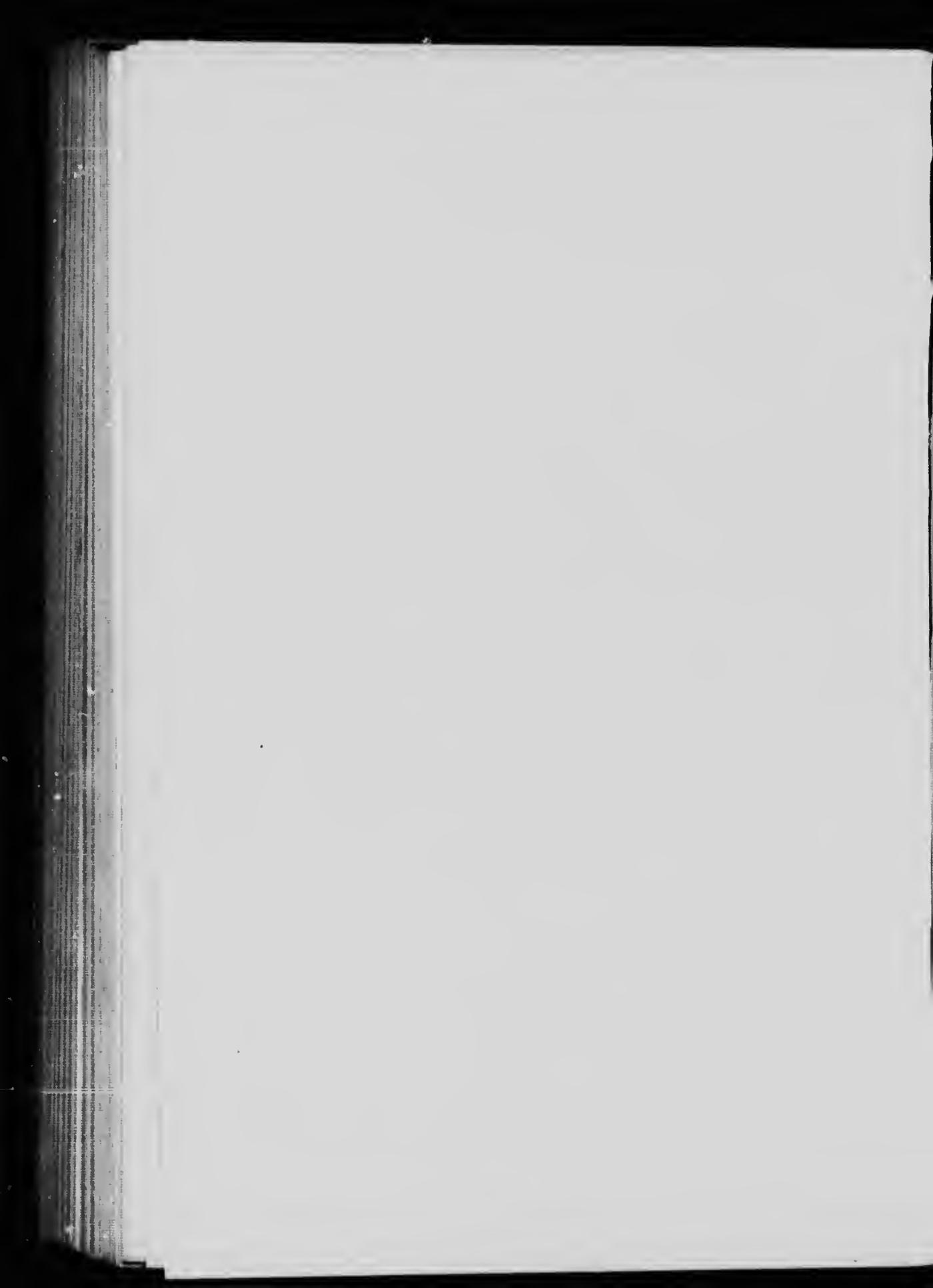
Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
110	24	80.00		771	Ground at northeast corner.
	25	80.00		775	" "
	36	60.00		770	" "
111	1	80.00		772	" at northeast corner.
	12	33.08		755	Backwater of Peace river.
	12	80.00		768	Ground at northeast corner.
	13	80.00		770	" "
	24	32.00		755	Peace River south side.
	25	17.26		752	" north side.
	25	80.00		770	Ground at northeast corner.
36	80.00		777	" "	
112	1	26.00		764	Card river.
	1	80.00		816	Ground at northeast corner.
	12	80.00		818	" "
	13	80.00		815	" "
	24	80.00		811	" "
	25	80.00		815	" "
	36	80.00		815	" "



Photo by L. O. R. Dozors, D.L.S.  
Canadian Northern Railway bridge over North Saskatchewan river near Fort Saskatchewan, Alberta.



Photo by L. O. R. Dozors, D.L.S.  
Canadian Northern Railway station, Fort Saskatchewan, Alberta.



LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.  
 NINTH BASE LINE WEST OF FIFTH MERIDIAN.  
 NORTH BOUNDARY OF TOWNSHIP 32.  
 (APPROXIMATE ELEVATIONS.)

MAP 164

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
8	36	0.00	4645	Ground at northeast corner.
	36	44.00	4625	"
	35	0.00	4680	" at northeast corner.
	35	40.00	4540	" $\frac{1}{4}$ post.
	34	40.00	4410	" "
	33	40.00	4465	"
	32	0.00	4530	" northeast corner.
9	36	0.00	4445	" "
	36	40.00	4545	" $\frac{1}{4}$ post.
	35	0.00	4640	" northeast corner.
	34	0.00	4715	" "
	34	40.00	4615	" $\frac{1}{4}$ post.
	32	0.00	4595	" at northeast corner.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## TENTH BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 36.

(APPROXIMATE ELEVATIONS.)

MAP 214

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
8	36	0.00		2795	Ground at northeast corner.
	36	40.00		2795	" 1/4 post.
	35	0.00		2830	" northeast corner.
	35	0.00		2820	" "
	34	40.00		2895	" 1/4 post.
	33	0.00		2810	" northeast corner.
	33	37.00		2720	" "
	33	78.00		2770	" "
	32	40.00		2970	" 1/4 post.
	31	40.00		3015	" "
9	36	0.00		2980	" northeast corner.
	36	40.00		3020	" 1/4 post.
	35	0.00		3110	" northeast corner.
	34	0.00		3260	" "
	33	0.00		3300	" "
	33	40.00		3355	" 1/4 post.
	32	49.00		3185	" "
31	0.00		3285	" northeast corner.	
10	31	9.00		3875	"
11	34	5.00		4560	"
	33	68.00		4255	"
	32	4.00		4225	"

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

ELEVENTH BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 40.

MAP 214

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
7	32	Chs. Lks. 55.00	3010	North Saskatchewan river.
	31	0.00	3114	Ground at northeast corner.
	31	60.00	3014	Creek flowing north.
8	36	0.00	3084	Ground at northeast corner.
	35	0.00	3094	" "
	34	0.00	3099	" "
	34	19.00	3059	Buster Creek.
	33	0.00	3109	Ground at northeast corner.
	32	0.00	3139	" "
	32	30.00	3084	Buster creek.
	31	0.00	3159	Ground at northeast corner.
9	36	0.00	3154	" "
	35	0.00	3169	" "
	34	0.00	3239	" "
	33	0.00	3459	" "
	32	0.00	3339	" "
	32	39.00	3299	Creek flowing north to Baptiste river.
	31	0.00	3339	Ground at northeast corner.
10	36	0.00	3394	" "
	35	0.00	3409	" "
	35	23.95	3289	South branch of Baptiste river.
	35	75.00	3459	Ground.
	34	0.00	3434	" at northeast corner.
	33	0.00	3449	" "
	33	44.00	3519	" "
	32	0.00	3494	" northeast corner.
	31	0.00	3519	" "
	31	53.40	3509	South branch of Baptiste river.
11	36	0.00	3724	Ground at northeast corner.
	36	40.00	3674	" 1/4 post.
	35	0.00	3749	" northeast corner.
	35	6.00	3724	Water in swamp.
	35	37.45	3654	South branch of Baptiste river.
	35	43.40	3769	Ground.
	34	0.00	3744	Ground at northeast corner.
	33	0.00	3809	" "
	33	64.00	3954	" "
	32	0.00	3919	" northeast corner.
	32	32.00	3959	" "
	32	78.00	3809	Creek flowing north.
31	0.00	3904	Ground at northeast corner.	

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## ELEVENTH BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 40.

MAPS 214, 213

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks.		
12	36	0.00	4069	Ground at northeast corner.
	35	0.00	4204	" "
	34	0.00	4254	" "
	34	68.75	3954	Creek flowing north.
	33	0.00	3984	Ground at northeast corner.
	32	0.00	4244	" "
	31	0.00	4374	" "
13	36	0.00	4349	" "
	35	0.00	4639	" "
	34	0.00	4739	" "
	33	0.00	4709	" "
	33	9.75	4604	Creek flowing south to Saskatchewan river.
	32	0.00	4479	Ground at northeast corner.
	31	0.00	4384	" "
	31	78.10	4189	Creek flowing south to Mire creek.
14	36	0.00	4264	Ground at northeast corner.
	36	63.70	4124	Mire creek.
	35	0.00	4169	Ground at northeast corner.
	34	0.00	4339	" "
	33	0.00	4299	" "
	32	0.00	4279	" "
	31	0.00	4349	" "
	31	61.71	4224	Mire creek.
15	36	0.00	4354	Ground at northeast corner.
	36	29.73	4609	" "
	35	0.00	4474	" northeast corner.
	34	0.00	4519	Ground at northeast corner.
	33	0.00	4394	" "
	33	72.00	4354	Mire creek.
	32	0.00	4369	Ground at northeast corner.
	31	0.00	4539	" "
16	36	0.00	4649	" "
	35	0.00	4834	" "
	34	0.00	5244	" "
	33	0.00	4924	" "
	33	9.72	4819	Creek flowing east to Mire creek.
	32	0.00	5039	Ground at northeast corner.
	31	0.00	5039	" "

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.  
 ELEVENTH BASE LINE WEST OF FIFTH MERIDIAN.  
 NORTH BOUNDARY OF TOWNSHIP 40.

MAP 213

Rge.	Sec.	Distance from N.E. Corner.		Feature.
		Chs. Lks.	Feet.	
17	36	0.00	5079	Ground at northeast corner.
	36	37.70	5349	Creek flowing north to Brazeau river.
	34	0.00	5744	Ground at northeast corner.
	33	54.50	5934	"
	31	35.45	7034	"
18	34	63.00	5879	"
	33	0.00	5819	" at northeast corner.
	32	0.00	5864	" "
	31	0.00	5884	" "
	31	58.50	5899	Branch of Brazeau river.
19	36	0.00	6004	Ground at northeast corner.
	35	0.00	6199	" "
	35	40.00	6379	" $\frac{1}{4}$ post.

## ELEVATIONS OF NATURAL FEATURES.

## EIGHTEENTH BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 66.

MAP 414

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		2130	Ground at fifth meridian.
	35	40.00		2230	" $\frac{1}{4}$ post.
	33	0.00		2200	" northeast corner.
2	36	0.00		1980	" "
	36	40.00		1900	" $\frac{1}{4}$ post.
	35	0.00		1940	" northeast corner.
	35	21.27		1837	Athabaska river, east side.
	35	32.97		1837	" west "
	35	40.00		1856	Ground at $\frac{1}{4}$ post.
	34	0.00		1910	" northeast corner.
	34	40.00		1960	" $\frac{1}{4}$ post.
	34	51.00		1950	Bisset lake.
	33	0.00		1970	Ground at northeast corner.
	33	17.30		1960	Bruce lake.
	31	0.00		2070	Ground at northeast corner.
3	36	0.00		2000	" "
	35	0.00		2020	" "
	34	22.80		1980	Saulteux river.
	34	40.00		2000	Ground at $\frac{1}{4}$ post.
	32	0.00		2010	" northeast corner.
4	36	0.00		2060	" "
	35	0.00		2090	" "
	34	0.00		2310	" "
	34	62.00		2350	East edge of valley.
	33	33.14		2300	Creek.
	32	0.00		2410	Ground at northeast corner.
	32	41.00		2480	" "
	32	58.22		2400	Creek.
5	36	0.00		2510	Ground at northeast corner.
	36	17.00		2540	" Summit.
	35	0.00		2480	" northeast corner.
	34	0.00		2320	" "
	34	60.00		2400	" "
	33	0.00		2340	" northeast corner.
	32	0.00		2340	" "
	31	0.00		2430	" "
	31	43.15		2520	Creek.
6	36	0.00		2650	Ground at northeast corner.
	36	58.38		2640	Creek.
	35	0.00		2700	Ground at northeast corner.
	35	31.12		2650	Creek.
	34	0.00		2700	Ground at northeast corner.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.  
EIGHTEENTH BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 68.

MAP 414

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.	
		Chs.	Lks.			
6	33	0.00		2670	Ground at northeast corner.	
	33	5.66		2590	Creek.	
	33	25.80		2570	Saulteux river.	
	32	0.00		2680	Ground at northeast corner.	
	31	0.00		2800	" "	
	31	32.00		2890	" "	
7	36	0.00		2830	" northeast corner.	
	35	0.00		2790	" "	
	35	12.70		2760	Allan river.	
	35	22.70		2860	Ground.	
	34	0.00		2950	" northeast corner.	
	34	6.67		2900	Creek.	
	33	0.00		3110	Ground at northeast corner.	
	33	6.10		3060	Creek.	
	33	40.00		3190	Ground at 1/4 post.	
	32	0.00		3300	" northeast corner.	
	31	0.00		3630	" "	
	31	40.00		3650	" 1/4 post.	
	8	36	0.00		3570	" northeast corner.
36		13.20		3450	Creek.	
36		26.46		3430	" "	
36		40.00		3470	" at 1/4 post.	
36		65.40		3300	Coutts river flowing southeast.	
35		0.00		3420	Ground at northeast corner.	
34		0.00		3610	" "	
33		0.00		3700	" "	
33		37.00		3320	Creek flowing to Swan river.	
33		56.00		3430	Ground.	
33		65.95		3300	Creek.	
32		0.00		3330	Ground at northeast corner.	
32		46.85		3030	Creek.	
31		0.00		2980	Ground at northeast corner.	
31		41.20		2880	Creek.	
9		36	0.00		2850	Ground at northeast corner.
		36	17.90		2780	Creek.
	36	22.30		2840	Chalmers road from Edmonton.	
	35	0.00		2880	Ground at northeast corner.	
	34	0.00		2730	" "	
	34	40.00		2660	" 1/4 post.	
	34	54.00		2570	" "	
	34	78.50		2555	Swan river (channel).	
	33	0.00		2560	Ground at northeast corner.	
	33	9.50		2555	Swan river (channel).	
	32	0.00		2680	Ground at northeast corner.	

## ELEVATIONS OF NATURAL FEATURES.

## EIGHTEENTH BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 68.

MAP 414

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
9	32	40.00		2820	Ground at $\frac{1}{4}$ post.
	31	0.00		2760	" northeast corner.
	31	40.00		2870	" $\frac{1}{4}$ post.
10	36	0.00		2960	" northeast corner.
	35	0.00		3260	" "
	34	0.00		3290	" "
	34	69.00		3270	" "
	33	0.00		3270	" at northeast corner.
	33	39.00		3410	Top of hill.
	32	0.00		3260	Ground at northeast corner.
	32	40.00		3440	" $\frac{1}{4}$ post.
	31	18.00		3640	" "
11	36	0.00		3370	" at northeast corner.
	36	27.00		3270	Murray river.
	36	40.40		3270	Sutherland river.
	36	50.00		3380	Ground.
	35	40.00		3710	Ground at $\frac{1}{4}$ post.
	34	40.00		4010	" "
				3800	House mountain 9 miles north of line.
	33	40.00		3590	Ground at $\frac{1}{4}$ post.
	32	52.00		3320	" "
31	33.00		3220	Inverness river.	
12	36	0.00		3340	Ground at northeast corner.
	35	0.00		3670	" "
	35	40.00		3830	" $\frac{1}{4}$ post.
	35	63.00		3890	" Summit.
	34	0.00		3700	" at northeast corner.
	34	40.00		3430	" $\frac{1}{4}$ post.
	34	56.15		3330	Goldsmith river.
	33	0.00		3460	Ground at northeast corner.
	33	40.00		3230	" $\frac{1}{4}$ post.
	33	49.90		3210	Driftpile river.
	32	0.00		3410	Ground at northeast corner.
	31	0.00		3650	" "
	31	40.00		3930	" $\frac{1}{4}$ post.
31	54.00		4130	Summit of mountain.	
13	36	0.00		3030	Ground at northeast corner.
	35	0.00		3570	" "
	34	0.00		3380	" "
	33	0.00		3170	" "
	32	0.00		3110	" "
	32	40.00		3030	" $\frac{1}{4}$ post.
	32	60.00		3070	" "

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

EIGHTEENTH BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 68.

MAP 413

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks.		
14	36	0.00	2780	Ground at northeast corner.
	36	15.00	2810	"
	36	65.94	2660	Stebbing creek.
	35	3.00	2640	Sidney river.
	35	40.00	2760	Ground at 1/4 post.
	35	71.90	2630	East Prairie river.
	34	40.00	2880	Ground at 1/4 post.
	34	69.90	2760	Allan lake, east side.
	33	70.00	2750	Ground.
	32	0.00	2660	Ground at northeast corner.
	32	64.50	2710	"
	32	74.10	2540	Wallace river.
	15	36	0.00	2770
35		0.00	2860	" "
34		0.00	2930	" "
33		40.00	2980	" 1/4 post.
32		0.00	3050	" northeast corner.
31		0.00	3160	" "
16	36	0.00	3130	" "
	36	59.00	3080	" east edge of valley.
	36	74.75	2870	Creek.
	35	26.00	3060	Ground, west edge of valley.
	34	28.00	2930	"
	33	29.00	2880	"
	33	41.00	2700	West Prairie river.
	32	0.00	2870	Ground at northeast corner.
	32	16.00	2920	"
	31	0.00	2830	" at northeast corner.
17	36	0.00	2850	" "
	35	0.00	2840	" "
	35	55.00	3060	"
	34	0.00	2980	" at northeast corner.
	34	40.00	2920	" 1/4 post.
	33	40.00	3080	" "
	33	59.60	3020	Creek.
	33	70.00	3090	Ground.
	31	0.00	3180	" at northeast corner.
	31	63.30	3300	" Summit of hill.
18	36	0.00	3180	Ground at northeast corner.
	36	40.00	3160	" 1/4 post.
	35	0.00	3130	" northeast corner.
	34	0.00	3090	" "
	34	49.67	3010	Creek.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## EIGHTEENTH BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 66.

MAP 413

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks.		
18	33	0.00	3090	Ground at northeast corner.
	32	40.00	2980	" $\frac{1}{4}$ post.
	31	0.00	3020	" northeast corner.
19	36	0.00	2950	" "
	36	40.00	2990	" $\frac{1}{4}$ post.
	35	0.00	2910	" northeast corner.
	34	0.00	2850	" "
	33	0.00	2740	" "
	32	0.00	2650	" "
	31	0.00	2600	" "
20	36	0.00	2500	" "

No further elevations recorded but country falls steadily to the west.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

TWENTY-FIRST BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 50.

MAP 464

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		1874	Ground at northeast corner.
	36	72.50		1873	Island lake.
	34	0.00		1875	Ground at northeast corner.
	34	25.80		1874	Burns creek.
	34	78.00		1879	Ground at witness mound.
	34	78.50		1875	Long lake, east side.
	32	28.85		1875	“ west “
	31	0.00		1905	Ground at northeast corner.
2	36	0.00		1918	“ “
	35	0.00		1973	“ “
	34	0.00		1991	“ “
	33	0.00		1992	“ “
				1950	Mistehae lake, four miles south of line, estimated.
	32	0.00		1999	Ground at northeast corner.
	31	0.00		2006	“ “
3	36	0.00		2029	“ “
	35	0.00		1966	“ “
	35	64.70		1913	Creek, flowing north to Pastecho river.
	34	2.30		1912	Ground at witness mound.
	33	0.00		1901	“ northeast corner.
	33	39.50		1890	Pastecho river.
	32	0.00		1895	Ground at northeast corner.
	32	56.60		1897	Creek, flows northwest to Pastecho river.
	31	0.00		1901	Ground at northeast corner.
	31	44.60		1898	Creek.
4	36	0.00		1910	Ground at northeast corner.
	35	0.00		1943	“ “
	35	23.80		1935	Creek flowing to Muskwa river.
	34	4.00		1948	Ground at witness mound.
	33	0.00		1975	“ northeast corner.
	32	0.00		1978	“ “
	31	0.00		2006	“ “
5	36	0.00		2027	“ “
	35	0.00		2081	“ “
	35	20.70		2042	Creek flowing southwest.
	35	73.00		2065	Ground at witness mound.
	34	7.75		2061	Creek.
	33	0.00		2119	Ground at northeast corner.
	32	10.00		2113	“ witness mound.
	31	0.00		2107	“ northeast corner.
	31	6.85		2101	Creek.

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-FIRST BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 20.

MAP 464

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks.		
6	36	0.00	2117	Ground at northeast corner.
	35	0.00	2108	" "
	34	0.00	2095	" "
	34	28.50	2044	Nipisi River.
			2055	Lake two miles south of line emptying to Nipisi river, estimated.
	33	0.00	2106	Ground at northeast corner.
	33	40.00	2126	" $\frac{1}{4}$ post.
	33	57.00	2093	" witness mound.
	33	58.80	2090	Lake, east side.
	32	44.40	2098	Ground on point of land.
	31	44.50	2090	Lake, west side
7	36	15.80	2116	Ground.
	35	0.00	2131	" at northeast corner.
	34	0.00	2150	" "
	33	0.00	2133	" "
	33	14.00	2126	Lake.
	32	13.00	2127	Ground at witness mound.
	32	59.10	2133	Lake.
8	36	10.30	2178	Ground.
	35	0.00	2171	" at northeast corner.
	34	0.00	2153	" "
	33	0.00	2168	" "
	33	73.00	2157	" witness mound.
	32	21.70	2155	Lake.
	31	0.00	2156	Ground at northeast corner.
9	36	0.00	2142	" "
	35	0.00	2126	" "
	34	0.00	2131	" "
	33	0.00	2097	" "
	33		2094	Atikamik river, flowing northeast.
			2105	Atikamik lake, south of line, estimated.
	32	0.00	2100	Ground at northeast corner.
31	0.00	2112	" "	
10	36	0.00	2124	" "
	35	0.00	2153	" "
	34	0.00	2162	" "
	33	0.00	2169	" "
	32	0.00	2173	" "
	32		2155	Small lake.
	31	0.00	2164	Ground at northeast corner.
	31	51.00	2206	" "
	31	80.00	2152	" witness mound.

ELEVATIONS OF NATURAL FEATURES.

TWENTY-FIRST BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 30.

MAPS 464, 463

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
11	30	0.00	2151	Small lake at northeast corner.
	35	0.00	2161	Ground at northeast corner.
	35	64.00	2136	Mink river, flowing to Atikamisis lake.
	34	0.00	2151	Ground at northeast corner.
	33	0.00	2182	" "
	32	0.00	2233	" "
	31	0.00	2288	" "
			2115	Atikamisis lake, 4 miles south of line, estimated.
12	36	0.00	2322	Ground at northeast corner.
	35	0.00	2346	" "
	34	0.00	2279	" "
	33	0.00	2261	Small lake at northeast corner.
	33	14.00	2262	Ground at witness mound.
	32	0.00	2319	" northeast corner.
	31	0.00	2313	" "
13	36	0.00	2273	" "
	35	0.00	2239	" "
	35	33.65	2219	Creek flowing north.
	34	0.00	2266	Ground at northeast corner.
			2210	Lake, 3 miles north of line, estimated.
	33	0.00	2319	Ground at northeast corner.
	32	0.00	2332	" "
31	0.00	2250	" "	
14	36	0.00	2241	" "
	36	67.10	2191	Creek, flows north to South Heart river.
	35	0.00	2216	Ground at northeast corner.
	35	15.40	2223	Ground.
	35	49.20	2141	South Heart river, flowing south.
	34	0.00	2208	Ground at northeast corner.
	34	58.00	2166	Creek flowing south.
	33	0.00	2196	Ground at northeast corner.
	32	0.00	2256	" "
	31	0.00	2287	" "
15	36	0.00	2295	" "
	35	0.00	2313	" "
	34	0.00	2309	" "
	34	68.50	2336	Creek.
	33	0.00	2345	Ground at northeast corner.
	32	0.00	2382	" "
	32	40.00	2390	" $\frac{1}{4}$ post.
	31	0.00	2293	" northeast corner.
	31	31.10	2210	Creek.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-FIRST BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 50.

MAP 463

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks.	Feet.	
16	36	0.00	2270	Ground at northeast corner.
	35	0.00	2367	" "
	34	0.00	2430	" "
	33	0.00	2426	" "
	32	0.00	2397	" "
	31	38.75	2370	Lake, west side.
17	36	0.00	2378	Ground at northeast corner.
	35	0.00	2424	" "
	34	0.00	2443	" "
	33	0.00	2485	" "
	32	0.00	2498	" " Highest point on this line.
	31	0.00	2433	Creek.
18	36	0.00	2412	Ground at northeast corner.
	35	0.00	2367	" "
	34	7.00	2367	" witness mound.
	34	23.60	2375	Ground.
	33	0.00	2329	" at northeast corner.
	33	78.10	2220	Creek flows south to North Heart river.
	32	0.00	2234	Ground at northeast corner.
	31	0.00	2192	" "
	31	21.00	2153	Creek.
19	36	0.00	2204	Ground at northeast corner.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

TWENTY-SECOND BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 84.

MAP (514)

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		1982	Ground at northeast corner.
	35	0.00		2019	" "
	34	0.00		2041	" "
	33			2067	Creek flowing to Trout river.
	32	0.00		2065	Ground at northeast corner.
	31			2060	Creek flowing south.
2	36	0.00		2069	Ground at northeast corner.
	35	40.00		2145	" 1/4 post.
	34	0.00		2213	" northeast corner.
	33	0.00		2273	" "
	32	0.00		2278	" "
	31	40.00		2189	" 1/4 post.
	31	75.60		2135	Hospital creek.
3	36	0.00		2169	Ground at northeast corner.
	35	0.00		2201	" "
	34	40.00		2233	" 1/4 post.
	33	0.00		2236	" northeast corner.
	32	30.00		2203	Lake.
	31	0.00		2210	Ground at northeast corner.
4	36	0.00		2211	" "
	35	0.00		2215	" "
	35	14.13		2190	Creek flowing to Trout river.
	34	0.00		2258	Ground at northeast corner.
	34	54.00		2160	"
	33			2049	Trout river.
	33	40.00		2121	Ground at 1/4 post.
	32	0.00		2198	" northeast corner.
	31	0.00		2272	" "
5	36	3.00		2295	" witness mound.
	36	34.65		2286	Lake.
	35	11.25		2338	Highest elevation on this line.
	34	0.00		2304	Ground at northeast corner.
	33	40.00		2258	" 1/4 post.
	32	0.00		2202	" northeast corner.
32	72.00		2159	" witness mound	
6	36	0.00		2183	" northeast corner.
	36	40.00		2164	Lake, north of line.
	35	0.00		2151	Ground at northeast corner.
	34	40.00		2107	" 1/4 post.
	33	0.00		2055	" northeast corner.
	33	40.00		1987	" 1/4 post.
	32			1977	Shoal river.
31	0.00		1995	Ground at northeast corner.	

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-SECOND BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 54.

MAP (514)

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
7	36	Chs. Lks. 0.00	2030	Ground at northeast corner.
	36		1961	Creek.
	35	40.00	1978	Ground at 1/4 post.
	34	40.00	2008	" "
	33	0.00	2043	Ground at northeast corner.
	32	40.00	2076	" 1/4 post. Summit.
	31	0.00	2036	" northeast corner.
8	36	0.00	1953	" "
	35	13.00	1939	" witness mound.
	34	0.00	1943	" northeast corner.
	33	56.00	1958	Lake.
	32	0.00	1963	Ground at northeast corner.
	31	0.00	1981	" "
9	36	0.00	2002	" " Summit.
	35	0.00	1973	" "
	34	0.00	1952	" "
	33	0.00	1906	" "
	32	0.00	1891	" "
	31	11.00	1827 1670	" witness mound. Loon lake, 10 miles north of line, estimated
10	36	0.00	1796	Ground at northeast corner.
	35	0.00	1787	" "
	34	0.00	1748	" "
	34		1729	Creek, headwaters of Loon river. Loon river valley is lowest elevation between Athabaska and Peace rivers for many miles. It has almost the same elevation as Wabiskaw valley.
	33	0.00	1736	Ground at northeast corner.
	32	0.00	1729	" "
	32	77.00	1750	" witness mound.
11	36	0.00	1787	" northeast corner.
	35	0.00	1769	" "
	34	0.00	1765	" "
	33	11.40	1764	" "
	32	0.00	1785	" at northeast corner.
	31	0.00	1798	" "
12	36	0.00	1822	" "
	35	0.00	1850	" "
	34	0.00	1855	" "
	33	0.00	1862	" "
	32	27.47	1856	Lake, east side (July).



Athabasca river.

Photo by F. A. SEMMEL, D.L.S.



Mound at NE. corner of section 12, township 105, range 18, west of Fifth meridian.

Photo by J. A. FLETCHER, D.L.S.



LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

TWENTY-SECOND BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 24.

MAP 513

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
12	31	0.00		1855	Ground at northeast corner.
13	36	0.00		1829	" "
	35	0.00		1859	" "
	34	0.00		1868	" "
	33	0.00		1893	" "
				1817	Lubicon lake, one mile north of line.
		32	0.00		1898
14	31	0.00		1898	" "
	36	0.00		1931	" "
	35	0.00		1971	" "
	34	0.00		1992	" "
	33	0.00		2019	" "
	33	47.63		2021	Creek flows to Lubicon lake.
	32	0.00		2040	Ground at northeast corner.
	31	0.00		2045	" "
	31	54.47		2053	Creek flows to Lubicon lake.
15	36	0.00		2055	Ground at northeast corner.
	35	0.00		2111	" "
	34	0.00		2146	" "
	33	0.00		2168	" "
	32	0.00		2168	" "
	32	77.00		2120	Cadotte river.
16	36	0.00		2192	Ground at northeast corner.
	35	0.00		2275	" "
	35	22.70		2267	Creek flows to Cadotte river.
				2050	Cadotte lake 7 miles north of line, estimated.
	34	2.00		2285	Ground at witness mound.
	34	28.00		2303	" Summit.
	32	0.00		2249	" at northeast corner.
	32	40.00		2273	" 1/4 post.
	31	0.00		2251	" northeast corner.
	17	36	2.00		2225
36		31.20		2222	Lake. August.
35		0.00		2238	Ground at northeast corner.
35		74.20		2173	Lake.
34		40.00		2191	Ground at 1/4 post.
34		62.20		2188	Lake.
33		40.00		2196	Ground at 1/4 post.
32		0.00		2191	" northeast corner.
31		2.00		2195	" witness mound.

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-SECOND BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 84.

MAP 513

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
18	36	0.00		2204	Lake. September.
	36	40.00		2223	Ground at $\frac{1}{4}$ post.
	35	0.00		2230	" northeast corner.
	34	0.00		2140	" "
	34	61.15		2105	Creek.
	33	40.00		2087	Ground at $\frac{1}{4}$ post.
	32	0.00		2065	" northeast corner.
	31	0.00		2047	" "
19	36	0.00		2036	" "
	35	0.00		2027	" "
	34	7.60		2011	Lake.
	33	0.00		2024	Ground at northeast corner.
	33	71.50		1996	Lake.
	31	0.00		1976	Ground at northeast corner.
20	36	0.00		1946	Ground at northeast corner.
	35	0.00		1904	" "
	34	0.00		1876	" "
	33	4.60		1817	" "
	32	0.00		1734	" "
	31	0.00		1708	" "
	31	25.00		1694	" "
	31	40.00		1538	" $\frac{1}{4}$ post.
	31	61.00		1246	Creek.
21	36	0.00		1421	Ground at northeast corner.
				1011	Peace river, at confluence of creek north of line. September.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

TWENTY-THIRD BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 88.

MAP (514)

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		2312	Ground at northeast corner.
	36	63.00		2534	"
	35	0.00		2508	" northeast corner.
	35	61.00		2536	"
	34	0.00		2489	" at northeast corner.
	34	24.00		2419	Lake, east side, April.
	33	0.00		2435	Ground at northeast corner.
	32	0.00		2484	" "
	31	0.00		2595	" "
	2	36	0.00		2536
35		0.00		2615	" "
35		52.00		2679	Highest point on this line.
34		0.00		2618	Ground at northeast corner.
33		0.00		2581	" "
32		0.00		2537	" "
31		0.00		2461	" "
3		36	0.00		2397
				2327	Quitting lake, east side.
	35	36.60		2330	Ground.
	34	0.00		2368	" at northeast corner.
	34	20.50		2358	Creek flowing south.
	33	0.00		2379	Ground at northeast corner.
	32	0.00		2449	" "
	32	9.87		2429	Creek, flowing south.
	31	0.00		2599	Ground at northeast corner.
	31	65.00		2663	" Summit.
4	36	0.00		2655	" northeast corner.
	36	38.50		2601	Creek, flowing to Peerless lake.
	35	0.00		2588	Ground at northeast corner.
	34	0.00		2505	" "
	34	66.50		2398	Creek.
	33	0.00		2369	Ground at northeast corner.
	33	30.00		2325	Creek.
	32	0.00		2317	Ground at northeast corner.
	32	19.50		2284	Creek.
	31	0.00		2318	Ground at northeast corner.
	31	49.50		2272	Peerless lake, east side.
5	36	0.00		2299	Ground at northeast corner.
	33			2272	Peerless lake, west side.
	33	40.00		2282	Ground at 1/4 post.
	32	0.00		2309	" northeast corner.
	31	0.00		2404	" "

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-THIRD BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 69.

MAP (514)

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.	
6	36	Chs. Lks. 0.00	Feet. 2383	Ground at northeast corner.	
	35	0.00	2353	" "	
	35	55.00	2328	Height of land between Wabiskaw and Loon rivers.	
	34	40.00	2280	Ground at $\frac{1}{4}$ post.	
	33	0.00	2225	" northeast corner.	
	33	31.00	2175	River flowing northwest to Loon river.	
	33	74.00	2253	Ground.	
	31	0.00	2145	" at northeast corner.	
	7	36	0.00	2083	" "
		35	0.00	2023	" "
35		4.20	2023	Creek flowing north.	
34		0.00	2041	Ground at northeast corner.	
33		0.00	1981	" "	
33		62.40	2006	Creek flowing north.	
32		0.00	2031	Ground at northeast corner.	
32		40.00	2056	" $\frac{1}{4}$ post.	
31		0.00	1992	" northeast corner.	
8	36	0.00	1941	" "	
	35	0.00	1870	" "	
	35	40.00	1849	Water in swamp draining north.	
	34	0.00	1832	Ground at northeast corner.	
	33	0.00	1773	" "	
	32	0.00	1754	" "	
	32	56.00	1691	Creek flowing north.	
	31	0.00	1691	Ground at northeast corner.	
9	31	67.70	1681	Creek flowing north.	
	36	0.00	1679	Ground at northeast corner.	
		54.00	1631	Loon river.	
				Loon river flows for many miles in a valley which is lowest elevation between 5th meridian and Peace river. The valley has almost same elevation as Wabiskaw valley.	
	35	0.00	1644	Ground at northeast corner.	
	34	0.00	1666	" "	
	33	0.00	1674	" "	
32	11.00	1681	" witness mound.		
31	0.00	1684	" northeast corner.		
10	36	0.00	1713	" "	
	35	0.00	1743	" "	
		1670	Loon lake, 10 miles south of line, estimated		

LEVELLING OPERATIONS

245

ELEVATIONS OF NATURAL FEATURES.

TWENTY-THIRD BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 48.

MAPS (514), 513

Rge.	Sec.	Distance from NE. Corner.		Feature.
		Chs. Lks.	Feet.	
10	34	0.00	1787	Ground at northeast corner.
	33	0.00	1851	" "
	32	0.00	1851	" "
	32	42.50	1845	River, flowing south to Loon lake.
	31	0.00	1883	Ground at northeast corner.
11	36	0.00	1917	" "
	35	0.00	1959	" "
	34	0.00	2010	" "
	33	0.00	2070	" "
	33	60.00	2104	" "
	33	73.00	2072	Water in beaver pond.
	32	0.00	2095	Ground at northeast corner.
	31	0.00	2135	" "
12	31	16.82	2110	Creek, flowing south.
	36	0.00	2211	Ground at northeast corner.
	36	48.00	2210	Creek flowing south.
	35	0.00	2264	Ground at northeast corner.
	34	0.00	2301	" "
	33	0.00	2367	" "
	32	0.00	2401	" "
	31	0.00	2417	" "
13	36	0.00	2429	" "
	35	0.00	2443	Ground at northeast corner, height of land between Loon and Peace rivers.
	34	0.00	2420	Ground at northeast corner.
	33	0.00	2328	" "
	33	62.00	2299	Otter lake, source of Otter river.
	32	0.00	2303	Ground at northeast corner.
	31	0.00	2304	" "
	31	10.00	2301	Creek flowing north.
14	36	0.00	2346	Ground at northeast corner.
	35	0.00	2383	" "
	34	0.00	2379	" "
	33	0.00	2349	" "
	32	0.00	2319	" "
	31	0.00	2299	" "
15	36	0.00	2301	" "
	35	0.00	2286	" "
	34	0.00	2242	" "
	34	40.00	2284	" $\frac{1}{4}$ post.
	33	0.00	2267	" northeast corner.
	33	73.00	2249	Lake, east side.

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-THIRD BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 84.

MAP 513

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
15	32	3.00		2254	Ground at witness mound.
	32	74.25		2164	Otter creek. July
	31	1.00		2170	Ground at witness mound.
	31	50.00		2168	Creek flowing south.
	31	74.75		2182	Lake.
16	36	0.00		2185	Ground at northeast corner.
	36	48.00		2239	Lake, east side.
	35	0.00		2244	Ground at northeast corner.
	34	0.00		2214	" "
	33	0.00		2210	" "
	32	0.00		2180	" "
	31	0.00		2175	" "
17	36	0.00		2161	" "
	35	0.00		2136	" "
	35	4.58		2117	Creek flowing south to Cadotte river.
	34	0.00		2145	Ground at northeast corner.
	33	0.00		2133	" "
	33	67.20		2117	Creek flowing south to Cadotte river.
	32	0.00		2133	Ground at northeast corner.
	31	0.00		2140	" "
18	36	0.00		2164	" "
	35	21.60		2207	" "
	34	0.00		2164	" northeast corner.
	33	0.00		2052	" "
	32	0.00		2011	" "
	31	0.00		1961	" "
19	36	0.00		1919	" "
	35	0.00		1891	" "
	34	0.00		1865	" "
	33	0.00		1707	" "
	32	0.00		1793	" "
	31	0.00		1765	" "
	31	20.00		1767	" "
	31	40.00		1632	" $\frac{1}{4}$ post.
	31	69.30		1564	Little Cadotte river.
20	36	0.00		1514	Ground at northeast corner.
	36	29.50		1458	Little Cadotte river.
	35	0.00		1405	Ground at northeast corner.
	35	16.00		1462	" "
	35	40.00		1376	" at $\frac{1}{4}$ post.
	34	40.52		1246	Little Cadotte river.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

TWENTY-THIRD BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 44.

MAP 513

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
20	34			1214	Cadotte river, confluence with Little Cadotte river, 1,100 ft. south of line.
	34	77.20		1414	Ground.
	33	17.20		1191	"
	32	2.40		1656	"
21	36	0.00		1233	" at northeast corner
				980	Peace river, confluence with Cadotte river, 3 miles north of line.
				987	Whitemud river, entrance to Peace river, 3 miles south of line, estimated
					Ground at witness mound.
	35	4.00		1009	" $\frac{1}{4}$ post.
	35	40.00		1338	"
	35	60.00		1471	"
	34	0.00		1553	" northeast corner.
	34	40.00		1670	" $\frac{1}{4}$ post.
	33	0.00		1681	" northeast corner.
	32	0.00		1682	" "
31	0.00		1688	" "	
22	36	0.00		1738	" "
	36	69.30		1869	" "
	35	0.00		1820	" northeast corner.
	35	40.00		1834	" $\frac{1}{4}$ post.
	34	0.00		1789	" northeast corner.
	34	60.00		1973	"
	33	0.00		1953	" northeast corner.
	32	0.00		1805	" "
	31	0.00		1814	" "
					" "
23	36	0.00		1925	" "
	35	0.00		1902	" "
	35	42.80		1867	Creek, flowing northeast.
	34	0.00		1912	Ground at northeast corner.
	34	29.50		1886	Creek flowing northeast.
	33	0.00		1981	Ground at northeast corner.
	32	0.00		2059	" "
	32	5.00		2056	Creek flowing north.
	31	0.00		2122	Ground at northeast corner.
24	36	0.00		2140	" "
	35	0.00		2179	" "
	34	0.00		2201	" "
	33	0.00		2154	" "
	33	30.00		2143	Lake.
	33	51.00		2140	"



# MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



**APPLIED IMAGE Inc**

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## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-THIRD BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 88.

MAP 513

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
24	32	Chs. Lks. 0.00	2159	Ground at northeast corner.
	31	0.00	2161	" "
25	36	0.00	2193	" "
	35	0.00	2253	" "
	34	0.00	2303	" "
	34	40.00	2334	" $\frac{1}{4}$ post.
	33	0.00	2318	" northeast corner.
	33	16.00	2274	Lake, east side, headwaters of Battle river.
	32	0.00	2300	Ground at northeast corner.
26	31	0.00	2292	" "
	36	0.00	2288	" "
	36	32.85	2346	" sixth meridian.

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

TWENTY-FOURTH BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 02.

MAP 563

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.	
		Chs. Lks.	Feet.		
18	36	0.00	2211	Ground at northeast corner.	
	36	40.00	2128	" $\frac{1}{4}$ post.	
	35	0.00	2052	" northeast corner.	
	35	40.00	1991	" $\frac{1}{4}$ post.	
	34	0.00	1908	" northeast corner.	
	34	15.35	1891	Creek, flowing northwest to Peace river.	
	33	0.00	1847	Ground at northeast corner.	
	33	54.00	1809	Creek, flowing northwest to Peace river.	
	32	0.00	1797	Ground at northeast corner.	
	32	33.35	1780	Creek.	
	31	0.00	1773	Ground at northeast corner.	
	19	36	0.00	1762	" "
		36	49.10	1752	Creek.
35		0.00	1766	Ground at northeast corner.	
34		0.00	1760	" "	
34		35.50	1741	Creek.	
33		0.00	1700	Ground at northeast corner.	
32		0.00	1675	" "	
31		0.00	1653	" "	
20	36	0.00	1613	" "	
	36	31.63	1584	Creek.	
	35	0.00	1574	Ground at northeast corner.	
	35	79.00	1548	" at witness mound.	
	34	67.00	1507	"	
	34	72.30	1374	Creek.	
	33	0.00	1455	Ground at northeast corner.	
	32	0.00	1526	" "	
	31	0.00	1504	" "	
	31	8.00	1275	Creek.	
	31	34.40	1471	Ground.	
	31	40.00	1315	" at $\frac{1}{4}$ post.	
	31	56.60	964	"	
31	64.50	937	Peace river, water, east side.		
21	36	3.00	970	Ground at witness mound.	
	36	11.25	984	"	
	36	40.00	1151	" at $\frac{1}{4}$ post.	
	35	0.00	1465	" northeast corner.	
	34	0.00	1509	" "	
	33	0.00	1519	" "	
	32	0.00	1524	" "	
	31	0.00	1532	" "	
22	36	0.00	1540	" "	

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-FIFTH BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 06.

MAP 563

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
18	36	Chs. Lks.	Feet.	
		0.00	1438	Ground at northeast corner.
	35	0.00	1444	" "
	35	36.30	1356	South branch of Wolverine river.
	35	45.90	1447	Ground.
	34	0.00	1428	" at northeast corner.
	34	46.00	1429	Small lake, north of line.
	33	0.00	1447	Ground at northeast corner.
	32	0.00	1434	" "
	31	0.00	1417	Lake at northeast corner.
19	36	0.00	1423	Ground at northeast corner.
	35	0.00	1413	" "
	34	8.00	1428	" "
	33	0.00	1418	" at northeast corner.
	33	14.30	1454	" Summit.
	33	68.00	1399	Creek, flowing northwest to Peace river.
	32	0.00	1404	Ground at northeast corner.
	31	0.00	1413	" "
20	36	0.00	1394	" "
	36	16.40	1285	" "
	36	31.15	976	" "
	36	34.17	921	Peace river, water, east side. June.
			924	Confluence of Battle river and Peace river, seven miles south of line, estimated.
	35	4.15	977	Ground.
	35	40.00	1395	Ground at $\frac{1}{4}$ post.
	33	0.00	1447	" northeast corner.
	32	0.00	1474	" "
	31	0.00	1513	" "
	21	36	0.00	1538
35		1.00	1550	" witness mound.
34		0.00	1555	" northeast corner.
33		0.00	1558	" "
33		60.00	1570	Commencement of Hawk hills.
32		0.00	1595	Ground at northeast corner.
32		40.00	1690	" $\frac{1}{4}$ post.
31		0.00	1787	" northeast corner.
31		21.50	1823	Creek, flowing southeast.
31		40.00	1868	Ground at $\frac{1}{4}$ post.
22	36	0.00	1951	" northeast corner.

ELEVATIONS OF NATURAL FEATURES.

TWENTY-SIXTH BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 100.

MAP (613)

Rge.	Sec.	Distance from N.E. Corner.	Elev.	Feature.
18	36	0.00	1245	Ground at northeast corner.
	36	48.10	1314	" Summit.
	35	0.00	1209	" at northeast corner.
	35	14.00	1179	Creek flowing northwest to Peace river.
	35	40.00	1223	Ground at $\frac{1}{4}$ post.
	35	60.00	1292	"
	34	0.00	1263	" at northeast corner.
	33	0.00	1246	" "
	33	58.31	1006	Creek in local valley.
	32	1.80	1233	Ground.
	32	21.80	1239	Top of east side of valley of river.
	32	44.25	984	Wolverine river.
	32		1235	Top of west side of valley of river.
	31	14.21	1195	Ground.
	31	71.25	967	Creek in local valley.
19	36	20.00	1246	Ground.
	35	0.00	1269	" at northeast corner.
	34	0.00	1159	" "
	33	0.00	1048	" "
	32	0.00	944	" "
	31	0.00	963	" "
20	36	0.00	920	" "
	36	6.20	888	Peace river, water, east side, July.
	36	65.95	888	" west side.
	36	71.20	913	Ground.
	35	0.00	1126	" at northeast corner.
	35	31.00	1026	Creek in local valley.
	35	40.00	1150	Ground at $\frac{1}{4}$ post.
	34	0.00	1173	" at northeast corner.
	33	0.00	1189	" "
	32	0.00	1194	" "
	31	0.00	1211	" "
	36	0.00	1233	" "

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-SEVENTH BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 104.

MAPS 664, 663

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
9	32	Chs. Lks. 20.00	Feet. 1014	Ground.
	31	0.00	1015	" at northeast co. ner.
10	36	40.00	1017	" $\frac{1}{4}$ post.
	34	0.00	1014	" northeast corner.
	33	40.00	1015	" $\frac{1}{4}$ post.
	31	0.00	999	" northeast corner.
11	36	0.00	987	" "
	35	3.75	985	Creek flowing north to Bear river.
	34	0.00	986	Ground at northeast corner.
	33	40.00	991	" $\frac{1}{4}$ post.
	31	0.00	1001	" northeast corner.
12	36	40.00	1014	" $\frac{1}{4}$ post.
	35	0.95	1022	Creek.
	34	0.00	1013	Ground at northeast corner.
	33	40.00	1042	" $\frac{1}{4}$ post.
	32	9.28	1024	Creek.
	31	0.00	1045	Ground at northeast corner.
13	36	40.00	1051	" $\frac{1}{4}$ post.
	34	0.00	1056	" northeast corner.
	33	0.00	1066	" "
	32	40.00	1066	" $\frac{1}{4}$ post.
14	36	0.00	1063	" northeast corner.
	36	71.31	1048	Creek, headwaters of Bear river.
	35	45.70	1058	Creek.
	33	0.00	1085	Ground at northeast corner.
	33	60.00	1096	Creek, flowing northeast.
	32	40.00	1105	Ground at $\frac{1}{4}$ post.
15	36	0.00	1100	" northeast corner.
	35	40.00	1097	" $\frac{1}{4}$ post.
	33	0.00	1103	" northeast corner.
	32	40.00	1108	" $\frac{1}{4}$ post.
16	36	0.00	1114	" northeast corner.
	35	0.00	1122	" "
	35	17.70	910	Creek, in local valley, flowing north to Peace river.
	34	0.00	1100	Ground at northeast corner.
	33	0.00	1083	" "
	33	40.00	1088	" $\frac{1}{4}$ post.
	33	77.00	881	" witness mound.

ELEVATIONS OF NATURAL FEATURES.

TWENTY-SEVENTH BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 104.

MAP 663

Rge.	Sec.	Distance from NE. Corner.		Elev	Feature.
		Chs.	Lks.		
16	32			857	Peace river, water, on the east side of a southerly bend in the river opposite to an island, August.
17	34	0.00		879	Ground at northeast corner.
	34	40.00		898	" $\frac{1}{4}$ post.
	33	0.00		987	" northeast corner.
	32	0.00		1113	" "
	31	0.00		1121	" "
18	36	0.00		1123	" "
	35	0.00		1136	" "
	34	0.00		1168	" "
	34	51.80		1020	Creek in local valley.
	33	0.00		1112	Ground at northeast corner.
	32	0.00		1109	" "
	32	29.30		1111	" "
	32	36.57		951	" "
	32			868	Peace river, water, July.
	31	10.00		889	Ground at witness mound on west bank of river.
19	31	40.00		912	Ground at $\frac{1}{4}$ post.
	36	0.00		1031	" northeast corner.
	35	0.00		1118	" "
	34	0.00		1128	" "
	33	40.00		1162	Water in swamp at $\frac{1}{4}$ post.
	32	0.00		1159	Ground at northeast corner.
	20	36	0.00		1165
35		0.00		1171	" "
34		0.00		1160	" "
33		0.00		1161	" "
32		0.00		1138	Ground at northeast corner.
32		48.50		1121	Boyer river, south branch.
21	36	0.00		1139	Ground at northeast corner.
	35	0.00		1143	" "
	34	0.00		1146	" "
	33	0.00		1150	" "
	32	0.00		1157	" "
	31	0.00		1168	" "
22	36	0.00		1169	" "
	35	0.00		1185	" "
	34	0.00		1196	" "

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-EIGHTH BASE LINE WEST OF FIFTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 108.

MAPS 664, 663

Rge.	Sec.	Distance from N.E. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36			835	Ground on fifth meridian, 330 ft. south. of northeast corner.
	35	0.00		834	Ground at northeast corner.
	34	0.00		844	" "
	33	0.00		826	" "
	32	0.00		839	" "
	32	40.00		851	" $\frac{1}{4}$ post.
	31	0.00		844	" northeast corner.
	31	62.00		836	" "
2	36	29.09		853	"
	35	14.00		832	Small lake.
	35	52.00		846	Ground.
	35	59.00		832	Small lake.
	34	0.00		833	Ground at northeast corner.
	33	0.00		852	" "
	32	0.00		838	" "
	31	0.00		855	" "
3	36	0.00		840	" "
	35	40.00		844	" $\frac{1}{4}$ post.
	35			835	Fox lake.
	33	0.00		839	Ground at northeast corner.
	32	0.00		844	" "
	31	40.00		858	" $\frac{1}{4}$ post.
4	36	0.00		855	" northeast corner.
	35	0.00		848	" "
	34	4.00		879	" Summit.
	33	0.00		860	" northeast corner.
	33	78.00		795	" witness mound.
18	36	0.00		1021	Ground at northeast corner.
	35	0.00		1026	" "
	34	0.00		1035	" "
	33	0.00		1035	" "
	33	79.00		1021	Boyer river, north branch.
	32	40.00		1044	Ground at $\frac{1}{4}$ post.
	31	40.00		1049	" "
19	36	0.00		1054	" northeast corner.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

TWENTY-NINTH BASE LINE WEST OF FIFTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 112.

MAP 664

Rge.	Sec.	Distance from N.E. Corner.		Elev.	Feature.
		Chs.	Lks.		
1	36	0.00		815	Ground at fifth meridian.
	36	40.00		812	Small lake.
	35	0.00		856	Ground at northeast corner.
	35	22.00		863	"
	34	0.00		858	" at northeast corner.
	33	0.00		883	" "
	32	0.00		909	" "
	31	0.00		928	" "
2	36	0.00		960	" "

## ELEVATIONS OF NATURAL FEATURES.

## EAST OUTLINE OF RANGE 18, WEST OF FIFTH MERIDIAN.

TOWNSHIPS 9 TO 10.

MAP 563

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
88	36	80.00		2164	Ground at northeast corner.
89	1	80.00		2168	" "
	12	80.00		2146	" "
	13	80.00		2127	" "
	24	39.10		2111	Surface water.
	24	80.00		2114	Ground at northeast corner.
	25	80.00		2079	" "
	36	11.15		2047	Creek.
	36	80.00		2056	Ground at northeast corner.
90	1	80.00		2081	" "
	12	52.77		2071	Creek..
	12	80.00		2102	Ground at northeast corner.
	13	80.00		2038	" "
	24	29.33		2045	Little Cadotte river.
	24	80.00		2085	Ground at northeast corner.
	25	80.00		2104	" "
	36	43.90		2085	Jackpine river, flowing to Little Cadotte river.
	36	80.00		2096	Ground at northeast corner.
91	1	0.00		2099	" southeast corner.
	1	80.00		2121	" northeast corner.
	13	40.00		2089	" $\frac{1}{4}$ post.
	24	80.00		2136	" northeast corner.
	25	80.00		2225	" "
	36	80.00		2257	" "
92	1	80.00		2273	" "
	12	60.00		2309	Highest elevation on this line.
	13	80.00		2233	Ground at northeast corner.
	24	80.00		2225	" "
	25			2188	Creek flowing west to Peace river.
	25	80.00		2204	Ground at northeast corner.
	36	80.00		2211	" "
93	1	44.36		2232	" "
	1	80.00		2098	" at northeast corner.
	12	80.00		1986	" "
	13	80.00		1904	" "
	24	80.00		1860	" "
	25	80.00		1804	" "
	36	80.00		1772	" "
94	1	80.00		1740	Water in swamp.
	13	7.00		1705	Ground at witness mound.



Photo by F. V. SEIBERT, D.L.S.  
Camp on 26th base line west of Fourth meridian, Alberta.



Photo by L. O. R. DOZOIS, D.L.S.  
Canadian Northern Railway bridge over North Saskatchewan river near Battleford, Saskatchewan.



ELEVATIONS OF NATURAL FEATURES.

EAST OUTLINE OF RANGE 18, WEST OF FIFTH MERIDIAN.

TOWNSHIPS 80 TO 108

MAPS 563, (613)

Tp.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
94	13	62.00	1681	Creek.	
	24	80.00	1647	Ground at north east corner.	
	25	80.00	1596	" "	
	36	57.00	1552	South branch of Wolverine river.	
	36	80.00	1564	Ground at northeast corner	
95	1	0.00	1551	" southeast corner.	
	1	80.00	1529	" northeast corner.	
	12	43.76	1502	South branch of Wolverine river.	
	12	80.00	1507	Ground at northeast corner.	
	13	80.00	1471	" "	
	25	45.59	1455	South branch of Wolverine river.	
	25	80.00	1475	Ground at northeast corner.	
36	80.00	1449	" "		
96	1	80.00	1412	" "	
	12	80.00	1465	" "	
	13	80.00	1454	" "	
	25	40.00	1446	" 1/4 post.	
	36	80.00	1438	" northeast corner.	
97	1	80.00	1430	Ground at northeast corner	
	12	77.92	1378	Creek flowing southwest.	
	13	80.00	1424	Ground at northeast corner	
	24	80.00	1430	" "	
	36	80.00	1414	" "	
98	1	80.00	1403	" "	
	12	80.00	1400	" "	
	24	75.00	1395	" witness mound.	
	25	80.00	1402	" northeast corner.	
	36	36.76	1277	South branch of Wolverine river.	
	36	50.50	1405	Ground.	
	36	78.00	1232	" at witness mound.	
36	80.00	1216	South branch of Wolverine river.		
99	1	0.00	1391	Ground at southeast corner.	
	1	80.00	1375	" northeast corner.	
	12	40.00	1202	" 1/4 post.	
	12	80.00	1165	" northeast corner.	
	13	14.50	1142	South branch of Wolverine river.	
	13	48.00	1355	Ground.	
	24	80.00	1374	" at northeast corner.	
	36	22.00	1367	" "	
	36	80.00	1096	Wolverine river.	

## ELEVATIONS OF NATURAL FEATURES.

## EAST OUTLINE OF RANGE 18, WEST OF FIFTH MERIDIAN.

TOWNSHIPS 89 TO 108.

MAP 663

Tp.	Sec.	Distance from SE. Corner.		Elev.	Feature.
		Chs.	Lks.		
100	1	32.30		1339	Ground.
	12	80.00		1327	" at northeast corner.
	13	40.00		1335	" $\frac{1}{4}$ post.
	24	16.95		1093	River flowing west to Peace river.
	24	42.98		1325	Ground.
	25	8.95		1147	Creek.
	25	80.00		1320	Ground at northeast corner.
	36	80.00		1245	" "
101	1	80.00		1300	" "
	12	80.00		1287	" "
	24	60.00		1297	" "
	25	3.00		1165	" at witness mound.
	25	13.90		1156	Creek flowing to Peace river.
	25	40.00		1255	Ground at $\frac{1}{4}$ post.
	36	80.00		1319	" northeast corner.
102	12	80.00		1345	" "
	13	80.00		1366	" "
	24	80.00		1346	" "
	36	80.00		1307	" "
103	1	0.00		1287	" southeast corner.
	12	80.00		1251	" northeast corner.
	24	80.00		1207	" "
	36	80.00		1163	" "
104	12	80.00		1149	" "
	13	80.00		1153	" "
	24	80.00		1134	" "
	36	80.00		1123	" "
105	1	15.00		1103	Ground.
	1	24.04		867	Peace river, water, south side.
	1	80.00		886	Ground at northeast corner, on an island.
	12	15.70		867	Peace river, water, north side.
	12	40.00		961	Ground at $\frac{1}{4}$ post.
	12	60.30		1069	" "
	12	80.00		1102	" at northeast corner.
	13	80.00		1141	" "
	24	80.00		1137	" "
	25	80.00		1147	" "
	36	63.40		1174	" "
	36	80.00		1146	" at northeast corner.
106	1	80.00		1147	" "
	12	80.00		1119	" "

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

EAST OUTLINE OF RANGE 18, WEST OF FIFTH MERIDIAN.

TOWNSHIPS 89 TO 108.

MAP 663

Tp.	Sec.	Distance from S.E. Corner.		Elev.	Feature.
		Chs.	Lks.		
106	13	80.00		1114	Ground at northeast corner.
	24	80.00		1103	" "
	25	80.00		1101	" "
	36	78.46		1120	" "
107	1	0.00		1098	" southeast corner.
	1	78.46		1171	" northeast corner.
	12	80.00		1100	" "
	13	80.00		1093	" "
	24	80.00		1095	" "
	25	80.00		1067	" "
	36	80.00		1054	" "
108	1	80.00		1042	" "
	12	80.00		1034	" "
	13	40.00		1050	" 1/4 post.
	24	80.00		1033	" northeast corner.
	25	48.00		1016	Boyer river, south branch.
	25	80.00		1032	Ground at northeast corner.
	36	64.74		1006	Boyer river, north branch.
36	77.00		1023	Ground, 198 ft. south of northeast corner.	

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## EAST OUTLINE OF RANGE 22, WEST OF FIFTH MERIDIAN.

TOWNSHIPS 89 TO 92.

MAP 563

Tp.	Sec.	Distance from S.E. Corner.		Elev.	Feature.
		Chs.	Lks.		
88	36	80.00		1738	Ground at northeast corner
89	1	80.00		1683	" "
	12	80.00		1654	" "
	13	80.00		1643	" "
	24	80.00		1642	" "
	36	40.00		1623	" 1/4 post.
90	1	80.00		1589	" northeast corner.
	12	43.69		1576	Creek.
	12	80.00		1569	Ground at northeast corner.
	13	56.50		1407	Creek in local valley.
	13	80.00		1550	Ground at northeast corner.
	24	80.00		1498	" "
	25	38.04		1230	Creek in wide valley.
	25	80.00		1429	Ground at northeast corner.
	36	51.36		1464	Creek.
	36	80.00		1533	Ground at northeast corner.
91	1	0.00		1555	" southeast "
	12	40.00		1552	" 1/4 post.
	13	40.00		1538	" "
	24	3.19		1212	Creek in local valley.
	24	80.00		1548	Ground at northeast corner.
	25	80.00		1548	" "
	36	80.00		1545	" "
92	1	40.00		1540	" 1/4 post.
	2	4.00		1534	Creek
	13	40.00		1537	Ground at 1/4 post.
	24	80.00		1544	" northeast corner.
	25	80.00		1545	" "
	36	80.00		1540	" "

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

SIXTH MERIDIAN.

MAPS 512, 563

Tp.	Sec.	Distance from S.E. Corner.		Elev.	Feature.
		Chs.	Lks.		
84	36	80.00		2477	Ground at northeast corner.
85	1	80.00		2504	" "
	12	80.00		2628	" "
	13	69.37		2726	" "
	24	54.30		2683	Creek.
	24	80.00		2639	Ground at northeast corner.
	25	80.00		2520	" "
	36	80.00		2742	Highest elevation on this line.
86	1	9.00		2730	Ground.
	1	80.00		2450	Ground at northeast corner.
	12	80.00		2287	" "
	13	65.87		2312	" "
	24	80.00		2237	" at northeast corner.
	25	80.00		2199	" "
87	1	11.69		2132	Creek.
	1	69.85		2127	Whitemud river. October.
	12	80.00		2210	Ground at northeast corner.
	13	80.00		2223	" "
	24	80.00		2264	" "
	25	80.00		2286	" "
	36	80.00		2304	" "
88	1	80.00		2373	" "
	12	80.00		2423	" "
	13	27.79		2412	Creek flowing to Whitemud river.
	13	80.00		2485	Ground at northeast corner.
	24	24.00		2512	Creek flowing to Whitemud river.
	24	40.00		2563	Ground at $\frac{1}{4}$ post.
	24	80.00		2703	" northeast corner. Summit.
	25	20.00		2605	Ground.
	25	27.65		2544	Creek, head waters of Battle river.
	25	80.00		2414	Ground at northeast corner.
89	1	80.00		2301	" "
	12	80.00		2260	Ground at northeast corner.
	13	60.00		2230	Creek, headwaters of Battle river.
	13	80.00		2234	Ground at northeast corner.
	24	80.00		2235	" "
	25	30.00		2216	Creek, headwaters of Battle river.
	25	80.00		2243	Ground at northeast corner.
	36	80.00		2232	" "

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## SIXTH MERIDIAN.

MAP 563

Tp.	Sec.	Distance from S.E. Corner.	Elev.	Feature.
90	1	Chs. Lks. 80.00	2236	Ground at northeast corner.
	12	80.00	2233	" "
	13	80.00	2213	" "
	24	80.00	2236	" "
	25	80.00	2182	" "
	36	80.00	2163	" "

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

EIGHTEENTH BASE LINE WEST OF SIXTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 68.

MAP 412

Rge.	Sec.	Distance from N.E. Corner.	Elev.	Feature.
9	36	0.00	2337	Ground at northeast corner.
	36	15.30	2316	Iroquois creek.
	36	22.00	2324	Creek.
	35	0.00	2350	Ground at northeast corner.
	35	52.00	2328	Creek.
	34	0.00	2340	Ground at northeast corner.
	34	58.47	2339	Callahoo creek.
	33	0.00	2343	Ground at northeast corner.
	33	40.00	2356	" 1/2 post.
	32	0.00	2402	" northeast corner.
	32	40.00	2439	" 1/4 post.
	31	0.00	2410	" northeast corner.
	31	40.00	2391	" 1/4 post.
	10	36	0.00	2344
35		0.00	2326	" "
34		0.00	2323	" "
33		0.00	2296	" "
33		10.00	2196	" "
33		15.00	2024	" "
33		22.00	1999	Nose creek.
33		25.87	2143	Top of cutbank.
33		40.00	2304	Ground at 1/4 post.
32		0.00	2334	" northeast corner.
31		0.00	2350	" "
11	36	0.00	2359	" "
	35	0.00	2378	" "
	34	0.00	2392	" "
	33	0.00	2390	" "
	33	40.00	2377	" 1/4 post.
	33	54.80	2170	Creek.
	32	40.00	1984	Wapiti river.
	32	54.00	2209	Ground.
	32	72.60	2384	Top of river bank.
	31	0.00	2391	Ground at northeast corner.
	12	36	0.00	2415
35		0.00	2452	" "
34		0.00	2475	" "
34		40.00	2492	" 1/4 post.
34		69.10	2508	Grand Trunk Pacific survey stake B2476 (abandoned location).
33		0.00	2452	Ground at northeast corner.
33		28.00	2459	Creek flowing southeast to Wapiti river.
33		40.00	2490	Ground at 1/4 post.

## ELEVATIONS OF NATURAL FEATURES.

## EIGHTEENTH BASE LINE WEST OF SIXTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 68.

MAP 412

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
12	33	49.00		2486	Creek.
	32	0.00		2520	Ground at northeast corner.
	31	0.00		2549	" "
13	36	0.00		2588	" "
	36	40.00		2611	" $\frac{1}{4}$ post.
	36	62.90		2603	Creek, flowing northeast.
	35	0.00		2639	Ground at northeast corner.
	34	0.00		2693	" "
	34	30.00		2775	" "
	34	40.00		2838	" at $\frac{1}{4}$ post.
	33	0.00		2895	" northeast corner.
	32	0.00		2922	" "
	31	0.00		2948	" "
	31	40.00		3042	" $\frac{1}{4}$ post
31	70.00		2963	" Summit.	
14	36	0.00		2907	" at northeast corner.
	36	10.00		2891	Creek flowing north to Redwillow creek.
	36	40.00		2925	Ground at $\frac{1}{4}$ post.
	36	60.15		2979	Ground.

ELEVATIONS OF NATURAL FEATURES.

TWENTY-SECOND BASE LINE WEST OF SIXTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 84.

MAPS 512, 511

Rge.	Sec.	Distance from N.E. Corner.		Elev.	Feature.
		Chs.	Lks.		
13	36	0.00		2426	Ground at northeast corner.
	35	7.00		2444	"
	34	6.00		2454	"
	33	27.88		2421	Boundary lake, east side, empties to Clear river.
					West boundary of Alberta.
	32	35.00		2427	Ground.
	31	17.50		2415	Creek.
14	36	8.00		2407	Ground.
	35	10.00		2339	"
	34	12.00		2247	"
	33	14.50		2169	Creek, flowing south in ravine.
	32	4.00		2243	Ground.
	31	18.00		2255	"
15	36	10.00		2347	"
	36	53.00		2433	"
	35	17.39		2408	Creek flowing south.
	34	12.00		2484	Ground.
	33	3.00		2567	" Summit.
	32	10.00		2554	"
	31	12.00		2549	"
16	36	16.00		2555	"
	36	45.21		2525	Creek flowing southwest to North Pine river.
	35	79.68		2469	Creek.
	33	8.00		2417	Ground.
	32	15.00		2383	"
	31	27.00		2480	"
17	36	23.00		2431	"
	35	63.91		2335	Cecil lake, east side.
	33	18.90		2335	" west side.
	32	40.00		2343	Ground at 1/4 post.
	31	3.00		2364	"
	31	72.90		2294	Top of valley, east side
			1650	North Pine river, estimated	
18	35	11.60		2160	Top of valley, west side.
	34	40.00		2153	Ground at 1/4 post.
	33	60.00		2251	"
	32	1.00		2328	"
	32	45.00		2436	"
	31	18.00		2257	"
	31			1936	Montagneuse creek, flowing S. in ravine

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-SECOND BASE LINE WEST OF SIXTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 84.

MAP 511

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
19	36	Chs. Lks. 48.00	Feet. 2252	Ground.
	35	23.00	2409	"
	34	60.00	2666	" Summit.
	33	53.07	2365	Creek.
	33	76.90	2407	Ground.
	32	10.20	2289	Charlie lake, east side. This lake drains southeasterly to North Pine river.
20	36	43.00	2502	Ground.
	35	9.00	2655	"
	34	15.00	2709	"
	34	49.00	2700	Creek.
	33	8.00	2825	Ground.
	33	31.80	2864	" Summit.
	32	0.00	2668	" at northeast corner.
	31	0.00	2460	" "
	31	10.75	2304	Creek flowing to Peace river.
21	36	0.00	2554	Ground at northeast corner.
	36	54.00	2764	" Summit.
	35	40.00	2367	" at 1/4 post.
	34	0.00	2561	" at northeast corner.
	34	40.00	2248	" at 1/4 post.
	33	24.04	1640	Creek, in ravine, flowing south to Peace river.
	33	70.00	2188	Ground.
	32	0.00	2284	" at northeast corner.
	32	31.50	2566	"
	31	0.00	2259	" at northeast corner.
	31	21.07	2090	Bean creek, flowing southeast.
22	36	0.00	2511	Ground at northeast corner.
	35	0.00	2799	" " Summit.
	35	38.35	2367	Creek.
	34	2.00	2253	Ground at witness mound.
	33	0.00	2130	" northeast corner.
	33	68.45	1850	Cache creek, east branch.
	31	16.00	2128	Ground.
	31	50.42	2005	Creek.
23	36	9.48	1880	Cache creek, west branch.
	35	8.00	2147	Ground.
	34	40.00	2168	" 1/4 post.
	32	5.00	2182	"
	32	65.50	2181	"
	31	40.00	1690	Halfway river in valley 450 ft. deep.

ELEVATIONS OF NATURAL FEATURES.

TWENTY-SECOND BASE LINE WEST OF SIXTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 84.

MAP 511

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
		Chs. Lks.	Feet.	
24	36	6.50	2147	Ground.
	35	0.00	2198	" at northeast corner.
	34	0.00	2191	" "
	33	9.00	2196	" "
	22	5.00	2203	" "
	31	40.00	2262	" 1/4 post.
25	36	0.00	2334	" northeast corner.
	35	0.00	2405	" "
	34	0.00	2439	" "
	33	0.00	2402	" "
	32	0.00	2500	" Summit.
	32	38.84	2455	Creek.
	31	0.00	2473	Ground at northeast corner.
	31	63.68	2429	Creek.
26	36	0.00	2439	Ground at northeast corner.
	36	48.75	2435	Creek flowing north to Halfway river

## ELEVATIONS OF NATURAL FEATURES.

## EAST OUTLINE OF RANGE 13, WEST OF SIXTH MERIDIAN.

TOWNSHIPS 83 TO 88.

MAP 512

Tp.	Sec.	Distance from SE. Corner.	Elev.	Feature.
83		Chs. Lks.	Feet.	
	1	0.00	2035	Ground at southeast corner.
	1	26.70	1888	" in ravine.
	12	20.00	2077	"
	13	6.1	2116	"
	24		2125	Creek, flowing east.
	25	18.00	2156	Ground.
84	36	9.00	2180	"
	1	20.00	2233	"
	12	24.00	2335	"
	13	15.40	2354	Creek flowing east.
	24	8.00	2392	Ground.
	25	7.00	2417	"
	25	62.00	2417	Lake.
85	36	17.00	2421	Ground.
	36	80.00	2426	" at northeast corner.
	1	26.00	2425	Creek flowing east.
	12	10.00	2428	Ground.
	12	80.00	2436	" at northeast corner. Summit
	13	80.00	2419	" "
	25	4.50	2391	Creek flowing east.
86	25	40.00	2383	Ground at $\frac{1}{4}$ post.
	25	80.00	2352	Creek.
	36	40.00	2368	Ground at $\frac{1}{4}$ post.
	1	11.25	2347	Creek flowing east.
	1	80.00	2357	Ground at northeast corner.
87	12	17.00	2353	Creek, flowing east.
	12	40.00	2390	Ground at $\frac{1}{4}$ post.
	12	69.00	2418	Creek flowing east.
	13	40.00	2460	Ground at $\frac{1}{4}$ post.
	24	5.00	2517	Creek, flowing west.
	25	10.00	2568	Ground. Summit.
	25	80.00	2529	" at northeast corner.
	26	20.12	2515	Creek, flowing northeast.
	26	50.50	2502	" east.
	36	80.00	2498	Ground at northeast corner.
	1	9.50	2542	Creek flowing to Clear river.
	1	80.00	2531	Ground at northeast corner.
	12	80.00	2541	" "
	13	69.00	2774	Creek flowing east.
	13	80.00	2796	Ground at northeast corner.
24	70.00	2916	" Summit.	
25	30.50	2859	Creek flowing northeast.	
25	80.00	2853	Ground at northeast corner.	

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

EAST OUTLINE OF RANGE 3, WEST OF SIXTH MERIDIAN.

TOWNSHIPS 83 TO 88.

AP 512

Tp.	Sec.	Distance from SE. Corner.		Feature.
		Chs. Lks.	Feet.	
87	36	55.00	2751	Creek.
88	1	80.00	2855	Ground at northeast corner.
	12	25.00	2793	Creek, flowing to Clear river.
	12	80.00	1942	Ground at northeast corner.
	13	80.00	3072	" "
	24	35.00	3096	Creek flowing to Clear river.
	24	80.00	3175	Ground at northeast corner.
	25	39.00	3227	Creek, flowing to Osborne creek.
	25	80.00	3318	Ground at northeast corner.
	36	60.00	3654	Highest point on this line.
36	80.00	3622	Ground at northeast corner.	

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES.

## TWENTY-THIRD BASE LINE WEST OF SIXTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 55.

MAP 512

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
1	36	0.00	2346	Ground at sixth meridian.
	35	0.00	2421	" northeast corner.
	34	0.00	2617	" "
	34	59.40	2762	" "
	33	0.00	2683	" at northeast corner.
	32	0.00	2757	" "
	32	39.86	2623	" $\frac{1}{4}$ post.
	31	0.00	2571	" northeast corner.
2	36	0.00	2710	" "
	36	40.08	2832	" $\frac{1}{4}$ post.
	35	0.00	2909	" northeast corner.
	35	40.08	2818	" $\frac{1}{4}$ post.
	34	0.00	2765	" northeast corner.
	34	43.75	2631	Creek flows to Whitemud river.
	33	17.40	2618	Creek.
	32	0.00	2647	Ground at northeast corner.
	31	0.00	2671	" "
	31	40.08	2544	" $\frac{1}{4}$ post.
31	55.55	2434	Creek.	
3	36	0.00	2468	Ground at northeast corner.
	35	40.08	2452	" $\frac{1}{4}$ post.
	35	61.30	2372	Whitemud river.
	34	0.00	2437	Ground at northeast corner.
	34	55.30	2425	Lake.
	33	0.00	2427	Ground at northeast corner.
	32	0.00	2543	" "
	31	0.00	2581	" "
	31	41.65	2496	Whitemud river, south branch.
4	36	0.00	2540	Ground at northeast corner.
	36	14.60	2552	Lake, east side.
	35	40.08	2661	Ground at $\frac{1}{4}$ post.
	34	52.40	2788	" "
	33	0.00	2661	" at northeast corner.
	32	0.00	2752	" "
	31	0.00	2904	" "
31	24.95	2808	Creek.	
5	36	0.00	2935	Ground at northeast corner.
	35	0.00	2781	" "
	34	0.00	2821	" "
	33	0.00	2864	" "
	32	0.00	2972	" "
	32	40.08	2904	" $\frac{1}{4}$ post.
31	20.70	3047	" "	

LEVELLING OPERATIONS

ELEVATIONS OF NATURAL FEATURES.

TWENTY-THIRD BASE LINE WEST OF SIXTH MERIDIAN.

NORTH BOUNDARY OF TOWNSHIP 66.

MAP 512

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Cha. Lks.	Feet.		
6	36	0.00	2987		Ground at northeast corner.
	36	40.08	3081		" 1/4 post.
	35	40.08	3053		" "
	34	11.00	2981		" "
	33	0.00	3211		" at northeast corner.
	32	0.00	3299		" "
	31	0.00	3259		" "
7	36	0.00	3327		" "
	35	40.08	3340		" 1/4 post.
	35	79.70	3342		Lake, east side.
	34	40.08	3369		Ground at 1/4 post.
	34	75.78	3328		Whitemud river.
	32	0.00	3351		Ground at northeast corner.
	31	0.00	3372		" "
8	36	0.00	3360		" "
	35	0.00	3325		" "
	35	35.92	3318		Creek.
	34	0.00	3256		Ground at northeast corner.
	33	5.00	3333		" witness mound.
	32	0.00	3424		" northeast corner.
	31	0.00	3409		" "
9	36	0.00	3424		" "
	35	0.00	3436		" "
	35	30.79	3320		Creek.
	34	0.00	3298		Ground at northeast corner.
	33	0.00	3409		" "
	32	0.00	3484		Ground at northeast corner.
	32	40.00	3453		" 1/4 post.
	31	0.00	3477		" northeast corner.
10	36	0.00	3511		" "
	35	0.00	3526		" "
	34	14.00	3588		" "
	33	0.00	3548		" at northeast corner.
	33	58.00	3372		Creek flowing south.
	32	0.00	3417		Ground at northeast corner.
	31	40.00	3518		" 1/4 post.
	31	66.00	3414		Creek flowing south.
11	36	0.00	3536		Ground at northeast corner.
	35	0.00	3483		" "
	35	20.00	3286		" "
	35	64.65	3086		Creek flowing south.
	34	20.00	3208		Ground.

## TOPOGRAPHICAL SURVEYS BRANCH

## ELEVATIONS OF NATURAL FEATURES

## TWENTY-THIRD BASE LINE WEST OF SIXTH MERIDIAN.

## NORTH BOUNDARY OF TOWNSHIP 88.

MAP 512

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
11	34	40.00		3337	Ground at $\frac{1}{4}$ post.
	33	40.00		3521	"
	32	10.00		3351	"
	32	35.00		3176	Creek.
	31	0.00		3357	Ground at northeast corner.
	31	53.00		3246	Creek.
12	36	0.00		3365	Ground at northeast corner.
	36	40.00		3540	" $\frac{1}{4}$ post.
	35	0.00		3387	" northeast corner.
	35	40.00		3550	" $\frac{1}{4}$ post.
	34	8.00		3511	Creek.
	34	40.00		3533	Ground at $\frac{1}{4}$ post.
	33	0.00		3616	" northeast corner.
	32	0.00		3635	" "
	31	1.00		3591	Branch of Clear river.
31	65.00		3683	Ground.	
13	36	0.00		3622	" at northeast corner.
	35	0.00		3363	" "
	34	0.00		3281	" "
	34	41.20		3205	Creek flowing to Osborne river.
	33	0.00		3042	Ground at northeast corner.
					West boundary of Alberta.
					(For continuation westerly see North boundary of Peace river block).



Photo by L. O. R. Dozors, D.L.S.  
P.B.M.—Q 27 on school-house, Oakville, Manitoba.



Photo by L. O. R. Dozors, D.L.S.  
P.B.M.—Q 31 on armory, Portage la Prairie, Manitoba.

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ELEVATIONS OF NATURAL FEATURES.  
NORTH BOUNDARY OF PEACE RIVER BLOCK.

NORTH BOUNDARY OF TOWNSHIP 88.

MAP 511

Rge.	Sec.	Distance from NE. Corner.		Elev.	Feature.
		Chs.	Lks.		
13	32	0.00		2856	Ground at northeast corner of section.
	31	0.00		2686	" " "
14	36	0.00		2643	" " "
	35	0.00		2588	" " "
	34	17.00		2573	Creek, flows to Osborne ereek.
	34	40.00		2583	Ground at 1/4 post.
	32	1.00		2524	" witness mound.
	31	0.00		2483	" northeast corner.
15	36	0.00		2444	" "
	6	58.95		2407	Creek flows to Osborne ereek.
	55	0.00		2425	Ground at northeast corner.
	34	49.00		2421	" 1/4 post.
	32	0.00		2364	" northeast corner.
	31	0.00		2327	" "
16	36	0.00		2313	" "
	36	1.50		2301	Beaver pond.
	36	11.00		2301	Osborne ereek.
	35	0.00		2331	Ground at northeast corner.
	34	0.00		2383	" "
	33	0.00		2349	" "
	33	40.00		2335	" 1/4 post.
	32	0.00		2258	" northeast corner.
	32	9.30		2199	Doig river.
	32	20.00		2316	Ground.
	31	0.00		2342	" at northeast corner.
17	36	0.00		2383	" "
	35	40.00		2414	" 1/4 post.
	33	0.00		2349	" northeast corner.
	32	0.00		2289	" "
	31	5.00		2245	Creek flowing to North Pine river.
18	36	0.00		2261	Ground at northeast corner.
	35	3.00		2157	" witness mound.
	35	20.00		2019	" "
	35	30.00		1844	North Pine river.
	35	40.00		1854	Ground at 1/4 post.
	34	0.00		1893	" northeast corner.
	34	29.00		1849	North Pine river.
	34	40.00		1914	Ground at 1/4 post.
	33	0.00		2119	" northeast corner.
	32	0.00		2250	" "
31	0.00		2346	" "	

## ELEVATIONS OF NATURAL FEATURES.

## NORTH BOUNDARY OF PEACE RIVER BLOCK.

## NORTH BOUNDARY OF TOWNSHIP 88.

MAP 511

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
19	36	Chs. Lks.	Feet.	Ground at northeast corner.
		0.00	2375	" "
	35	0.00	2314	" "
	34	40.00	2372	" $\frac{1}{4}$ post.
	33	0.00	2402	" northeast corner.
	33	50.00	2522	" "
	31	0.00	2371	" northeast corner.
20	31	57.50	2239	Creek.
	36	0.00	2314	Ground at northeast corner.
	36	40.00	2412	" $\frac{1}{4}$ post.
	35	26.50	2237	Creek flows to Blueberry river.
	34	0.00	2341	Ground at northeast corner.
	34	65.00	2321	Creek.
	33	20.00	2387	Ground.
	32	0.00	2290	" at northeast corner.
	32	18.50	2206	Creek.
	31	0.00	2299	Ground at northeast corner.
21	36	0.00	2305	" "
	36	40.00	2182	" $\frac{1}{4}$ post.
	35	0.00	2186	" northeast corner.
	35	23.00	2151	Blueberry river. (August).
	35		2164	" high water mark.
	34	0.00	2238	Ground at northeast corner.
	33	0.00	2245	" "
	32	0.00	2549	" "
	32	64.00	2458	Creek flowing to Blueberry river.
22	36	0.00	2543	Ground at northeast corner.
	36	30.00	2636	Ground.
	35	29.90	2307	Creek.
	34	0.00	2542	Ground at northeast corner.
	33	0.00	2650	" "
	32	10.00	2687	" "
	32	40.00	2513	" at $\frac{1}{4}$ post.
	32	66.80	2312	Creek.
31	30.00	2551	Ground.	
23	36	0.00	2367	" at northeast corner.
	36	24.00	2302	Blueberry river.
	36	40.00	2399	Ground at $\frac{1}{4}$ post.
	35	0.00	2449	" northeast corner.
	35	40.00	2571	" $\frac{1}{4}$ post.
	34	0.00	2639	" northeast corner.
	34	9.40	2576	Creek, flowing to Blueberry river.
	33	0.00	2821	Ground at northeast corner.
	33	59.00	2504	Creek.

LEVELLING OPERATIONS

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ELEVATIONS OF NATURAL FEATURES.

NORTH BOUNDARY OF PEACE RIVER BLOCK.

NORTH BOUNDARY OF TOWNSHIP 88.

MAP 511

Rge.	Sec.	Distance from NE. Corner.	Elev.	Feature.
23	32	Chs. Lks. 5.00	Feet. 2663	Ground.
	32	28.00	2588	Creek.
	31	0.00	2811	Ground at northeast corner.
	31	65.10	2710	Creek, flowing to Blueberry river.
24	36	0.00	2832	Ground at northeast corner.
	35	0.00	2887	" "
	35	40.00	2811	" 1/4 post.
	34	0.00	2669	" northeast corner.
	34	40.00	2798	" 1/4 post.
	33	0.00	2963	" northeast corner.
	32	0.00	2958	" "
	31	0.00	2611	" "
	31	37.50	2597	Creek, headwaters of Halfway river.
25	36	0.00	2811	Ground at northeast corner.
	35	0.00	2405	" "
	34	0.00	2944	" "
	28	0.00	2803	" "
	28	40.00	2545	" 1/4 post.
	29	0.00	2396	Ground at northeast corner.
	29	15.00	2378	Creek.
	30	0.00	2483	Ground at northeast corner.
	30	40.00	2580	" 1/4 post.
	30	74.88	2828	" northwest corner of Peace River Block.

## ELEVATIONS OF NATURAL FEATURES.

## WEST BOUNDARY OF PEACE RIVER BLOCK.

TOWNSHIPS 85 TO 88.

MAP 511

Tp.	Sec.	Distance from SW. Corner.		Elev.	Feature.	
		Chs.	Lks.			
84	36			2433	Ground at northwest corner of section.	
85	1	80.00		2420	" " "	
	12	80.00		2410	" " "	
	13	70.00		2224	Ground-bireh creek.	
	24	80.00		2429	Ground at northwest corner.	
	25	80.00		2527	" " "	
	36	80.00		2496	" " "	
86	1	80.00		2461	" " "	
	12	80.00		2502	" " "	
	13	49.00		2610	" " Summit.	
	13	80.00		2507	" at northwest corner.	
	24	40.00		2415	" $\frac{1}{4}$ post.	
	24	80.00		2258	" northwest corner.	
	25	33.00		2230	" " "	
	25	50.00		2390	" " "	
	25	60.00		2190	" " "	
	26			1984	" at northwest corner.	
	35	37.50		1965	Branch of Halfway river.	
	35	80.00		2031	Ground at northwest corner.	
	87	6	5.00		2030	Crossing of trail, Fort Graham to St. John.
		6	80.00		2241	Ground at northwest corner.
7		80.00		2328	" " "	
18		7.75		2330	Creek flowing southwest.	
18		40.00		2521	Ground at $\frac{1}{4}$ post.	
19		10.00		2726	" " Summit.	
19		40.00		2725	" at $\frac{1}{4}$ post.	
19		78.00		2563	Creek flowing east.	
30		40.00		2413	Ground at $\frac{1}{4}$ post.	
30		60.00		2287	Ground.	
30		74.00		2137	Cameron river, tributary of Halfway river.	
31		40.00		2157	Ground at $\frac{1}{4}$ post.	
31		80.00		2214	" northwest corner.	
88		6	80.00		2345	" " "
	7	40.00		2534	" $\frac{1}{4}$ post.	
	7	80.00		2857	Ground at northwest corner.	
	18	60.00		3124	" highest point on line.	
	18	80.00		3007	" at northwest corner.	
	19	40.00		3040	" $\frac{1}{4}$ post.	
	19	80.00		3039	" northwest corner.	
	30	40.00		2819	" $\frac{1}{4}$ post.	
	30	71.23		2828	Ground at northwest corner of Peace River Block.	

EDMONTON TO ATHABASKA.

*Precise Level Line D*

ALONG travelled roads to Tawntinaw and thence along the Canadian Northern railway to Athabaska.

MAP 315

Distance from Edmonton C.N.R. Station.	Locality and Description.	Elevation.
Miles.		Feet.
0.00	Canadian Northern railway station, Edmonton, base of rail.....	2285.10
2.68	Edmonton City B.M. 12. On Grand Trunk Pacific railway right of way, 130 yds. west of west side of Namayo Avenue, 1 ft. south of north right of way fence, marked "Elevation 237.32".....	2194.150
4.46	P.B.M.—D 2. West side of road, 3,622 ft. north of S.E. cor. sec. 29, 1 ft. east of fence, on top of iron pipe.....	2218.368
5.80	P.B.M.—D 3. West side of road, 23 ft. north of S.E. cor. sec. 5, 1 ft. east of fence, on top of iron pipe. ....	2232.082
9.84	P.B.M.—D 4. About 2 miles south of Namao. West side of road, 18 ft. north of S.E. cor. sec. 29, 2 ft. east of fence, on top of iron pipe.....	2240.786
11.85	P.B.M.—D 5. About $\frac{3}{4}$ miles west of Namao. West side of road, 5 ft. south of N.E. cor. sec. 32, 1 ft. east of fence, on top of iron pipe.....	2247.198
14.77	P.B.M.—D 6. About 2 miles east of Namao. North side of road, 1 ft. west and 6 ft. north of S.W. cor. sec. 6, on top of iron pipe.....	2201.875
18.32	P.B.M.—D 7. About $2\frac{1}{4}$ miles north of Duagh. West side of road, 58 ft. north of $\frac{1}{4}$ post on E. by sec. 24, 1 ft. east of fence, on top of iron pipe.....	2192.361
21.04	P.B.M.—D 8. Near New Lunnon, 68 ft. north of north boundary of road deviation going east through middle of sec. 29, and 2 ft. east of E. by sec. 29, on top of iron pipe.....	2200.959
24.69	P.B.M.—D 9. About 3.7 miles north of New Lunnon. West side of road, 178 ft. south of N.E. cor. sec. 8, 3 ft. east of fence, on top of iron pipe.....	2155.460
27.79	P.B.M.—D 10. 3.7 miles south of Fedorah. East side of road, 173 ft. north of N.E. cor. sec. 29, 6 ft. west of W. by sec. 33, on top of iron pipe.....	2217.823

## EDMONTON TO ATHABASKA.

MAP 365

*Precise Level Line D*

Distance from Edmonton C.N.R. Station.	Locality and Description.	Elevation.
Miles.		Feet.
30.80	P.B.M.—D 11. About $\frac{3}{4}$ mile west of Fedorah. North side of road, 72 ft. east and 64 ft. north of N.E. cor. sec. 8, on top of iron pipe.....	2156.885
32.85	Lily lake, water level.....	2096.25
33.13	P.B.M.—D 12. East side of Lily lake. East side of trail, 410 ft. southerly from N.E. cor. sec. 20, on top of iron pipe.....	2145.360
36.66	P.B.M.—D 13. About $2\frac{1}{2}$ miles north of north end of Lily lake, on west side of trail, 9 ft. west, 3 ft. north of the intersection of west boundary of trail and S. by sec. 8, on top of iron pipe.....	2161.416
39.88	P.B.M.—D 14. About 3 miles south of Waugh. On west side of trail, 225 ft. south of intersection of N. by sec. 19, on top of iron pipe.....	2079.927
43.28	Redwater river, water level.....	2010.06
43.68	P.B.M.—D 15. About $\frac{1}{2}$ mile north of Waugh. On west side of trail, 690 ft. northerly (along trail) from north edge of Redwater river, on top of iron pipe....	2052.318
47.75	P.B.M.—D 16. About 3 miles south of Egge's place, Halfway Lake, on left side of trail going from Edmonton, 2,170 ft. north of S. by sec. 25, on top of iron pipe.....	2167.097
50.59	P.B.M.—D 17. About 100 yds. north of entrance to Egge's place, Halfway Lake, on east side of trail, at intersection of N. by sec. 1, on top of iron pipe.....	2103.468
50.63	P.B.M.—17A. About 100 yds. north of entrance to Egge's place, Halfway Lake, on west side of trail, 10 ft. south of N. by sec. 1, on top of iron pipe.....	2102.892
54.11	P.B.M.—D 18. About $3\frac{1}{2}$ miles north of Egge's place, Halfway Lake, on east side of trail, 1,000 ft. north of S. by sec. 26, on top of iron pipe....	2134.293
58.27	P.B.M.—D 19. About $7\frac{3}{4}$ miles north of Egge's place, Halfway Lake, on east side of road, near intersection of N. by sec. 11, on top of iron pipe....	2198.390

EDMONTON TO ATHABASKA.

Precise Level Line D

MAP 365

Distance from Edmonton C.N.R. Station.	Locality and Description.	Elevation.
Miles.		Feet.
61.09	Tawatinaw station, base of rail.....	2025.71
61.61	P.B.M.—D 20. About $\frac{1}{2}$ mile north of Tawatinaw station, on Canadian Northern Railway right of way, 3 ft. south of 4th telegraph pole north of mileboard 59, and 14 ft. west of east right of way fence, on top of iron pipe.....	2030.985
63.88	T.B.M. 63. On 12th telegraph pole north of mileboard 61.....	2003.67
64.74	P.B.M.—D 21. About $3\frac{3}{4}$ miles north of Tawatinaw station, 4 ft. south of 6th telegraph pole north of 62 mileboard, 13 ft. west of east right of way fence, on top of iron pipe.....	2010.129
66.30	T.B.M. 66. On 9th telegraph pole south of mileboard 64.....	2012.59
67.03	Rochester station, base of rail.....	2001.02
67.58	P.B.M.—D 22. $\frac{1}{2}$ mile north of Rochester station, 70 ft. north of 65 mileboard, and 37 ft. east of centre of track, on top of iron pipe.....	1996.247
69.71	T.B.M. 69. On 5th telegraph pole north of mileboard 67.....	1983.70
72.00	T.B.M. 71. On spike, top of west end of south cross-piece of bridge, $12\frac{1}{2}$ telegraph poles north of mileboard 69.....	1985.32
73.26	T.B.M. 72. On 11th telegraph pole south of mileboard 71.....	1986.43
74.46	P.B.M.—D 23. About $\frac{1}{2}$ mile south of Lewiston station, 78 ft north of 6th telegraph pole south of 72 mileboard, 51 ft. west of centre of track, on top of iron pipe.....	1995.378
74.95	Lewiston station, base of rail.....	1987.270
76.58	T.B.M. 75. On 1st telegraph pole south of mileboard 74.....	1970.11
78.31	P.B.M.—D 24. About $3\frac{1}{2}$ miles north of Lewiston station, at Can. Nor. Ry. chainage 3997+30, opposite to 10th telegraph pole south of 76 mileboard, 50 ft. west of centre of track, on top of iron pipe.....	1948.529

## EDMONTON TO ATHABASKA.

*Precise Level Line D*

MAPS 365, 415

Distance from Edmonton C. N. R. Station.	Locality and Description.	Elevation.
Miles.		Feet.
79.36	T.B.M. 78. On bolt, top of east end of north cross tie, bridge at Can. Nor. Ry. chainage 4052.75....	1945.52
81.32	T.B.M. 80. On 23rd telegraph pole north of mile-board 78.....	1897.43
83.38	Meanook station, base of rail.....	1883.27
83.76	P.B.M.—D 25. About ½ mile north of Meanook station, 150 yds northeast of crossing of main road, Edmonton to Athabaska and 4½ telegraph poles north of 81 mileboard, 59 ft. east of centre of track, on top of iron pipe.....	1878.751
85.67	P.B.M. 85. On 1st telegraph pole north of mileboard 83 .....	1850.68
87.98	P.B.M.—D 26. 140 yds south of Colinton station, 17 ft. north of 12th telegraph pole north of 85 mileboard, and 50 ft. west of centre of track, on top of iron pipe.....	1792.679
88.06	Colinton station, base of rail.....	1796.42
89.90	T.B.M. 90. On 8th telegraph pole north of mile-board 87.....	1771.84
91.98	P.B.M.—D 27. About 4 miles north of Colinton station, 23 ft north of 19th telegraph pole north of 88 mileboard, 47 ft. east of centre of track, on top of iron pipe.....	1737.159
93.98	T.B.M. 94. On 9th telegraph pole north of N. by tp. 65.....	1725.49
95.19	P.B.M.—D 28. 2/3 mile south of Athabaska, 12 telegraph poles south of crossing of Tawatinaw river, 50 ft. east of centre of Canadian Northern railway track, on top of iron pipe.....	1709.177
95.33	P.B.M.—D 29. ½ mile south of Athabaska Landing, 8 telegraph poles south of crossing of Tawatinaw river, 50 ft. west of centre of Canadian Northern railway track, on top of iron pipe.....	1697.543
95.83	Athabaska, Canadian Northern Ry. station, base of rail	1691.17

WARMAN TO PRINCE ALBERT.

*Precise Level Line K.*

ALONG Canadian Northern Railway.

MAPS 218, 268

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
0.00	Warman station, diamond crossing.....	1675.73
	P.B.M.—F. 1. Warman. About 500 yds. west of station, 2 ft. north of Can. Nor. Ry. south right of way fence, and about 200 yds. southeast of elevator, on top of iron bolt set in top of square concrete pillar.	1676.835
0.27	P.B.M.—E 16. Warman. Schoolhouse, on east face near southeast corner of foundation wall, on copper plug.....	1679.880
3.97	Osler station, base of rail.....	1688.81
4.07	P.B.M.—E. 15. Osler. Frame dwelling house about 150 yds. northeast of Osler station house, owned by J. P. Grant, in west face of stone foundation, on copper plug set in stone.....	1687.845
10.56	P.B.M.—E 14. About 4¾ miles south of Hague. 12 ft. south of 9th telegraph pole north of mileboard 184, on copper plug set in side of concrete pillar ...	1701.027
15.22	P.B.M.—E 13. Hague. Water tank about 60 yds. south of station, on easterly face of foundation wall, on copper plug, set in concrete.....	1679.066
15.25	Hague station, base of rail.....	1677.41
20.94	P.B.M.—E 12. About 5¼ miles south of Rosthern. Farm house about 250 yds. east of railway, in west face of foundation wall near northwest corner of house, on copper plug set in concrete.....	1677.189
26.12	P.B.M.—E 11. Rosthern. Town Hall, south face, southeast corner of foundation wall, on copper plug set in concrete.....	1671.888
26.25	Rosthern station, base of rail.....	1672.43
32.24	P.B.M.—E 10. Leekford. G. C. Turner Co. elevator engine house, west face, northwest corner of foundation wall, on copper plug set in concrete.....	1657.735
32.40	Leekford station, base of rail.....	1660.72

## WARMAN TO PRINCE ALBERT.

*Precise Level Line E.*

## ALONG Canadian Northern Railway.

MAP 268, 269

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
37.22	P.B.M.—E 9. Duck Lake. Roman Catholic Church, east face, southeast corner of foundation wall on copper plug set in concrete.....	1658.117
37.76	Duck Lake station, base of rail.....	1660.44
43.63	P.B.M.—E 8. About 2½ miles south of Roddick, southeasterly face of railway water tank, on copper plug set in side of concrete foundation.....	1635.925
	(Roddick)	
54.20	P.B.M.—E 7. Maedowall. On highway bridge about ½ mile south of Maedowall station and 100 yds. west of Canadian Northern Ry. on copper plug set in side of concrete pier.....	1551.554
54.99	Maedowall station, base of rail.....	1557.73
59.34	P.B.M.—E 6. About 5 miles south of Clouston, 20 ft. south of 1st telegraph pole north of 233 mileboard, on copper plug set in side of concrete pillar.....	1517.73
64.21	Clouston station, base of rail.....	1498.00
64.28	P.B.M.—E 5. Clouston. Brick house northeast of station, on copper plug set in north face of foundation wall, near northwest corner of house.....	1501.091
68.34	P.B.M.—E 4. 5¼ miles south of Prince Albert, 50 ft. south of 1st telegraph pole north of mileboard 242, 45 ft. east of centre of track, on copper plug set in side of concrete pillar.....	1528.946
73.37	Prince Albert station, Canadian Northern Ry., base of rail.....	1413.30
	<i>Bench Marks, City of Prince Albert.</i>	
	P.B.M.—E 3. Corner Central Avenue and 15th Street, on extreme top of hydrant (City B.M.)....	1415.035
	P.B.M.—E 2. Corner Central Avenue and 14th Street, on extreme top of hydrant (City B.M.)....	1413.369

WARMAN TO PRINCE ALBERT.

*Previous Level Line K.*

ALONG Canadian Northern Railway.

MAP 319

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
	P.B.M.—E 1. Corner of Central Avenue and 13th Street, on extreme top of hydrant (City B. M.).....	1412.115
	P.B.M.—A 2. Post Office building, on top of south end of 4th step, south entrance( facing west) marked "B.M.".....	1412.154
	Public Works Department B. M., No. 176. On Canadian Northern Ry. bridge carrying Big River branch over North Saskatchewan river, on copper bolt leaded into top of concrete pier, south end east side of bridge under the platform.....	1403.500
	P.B.M.—A 1. On Canadian Northern Ry. bridge, carrying Big River branch over North Saskatchewan river, on south edge of top of concrete abutment, at north end of bridge, west side, about on level with the railway, marked "B.M".....	1410.260

## WARMAN TO EDMONTON.

Part of Lines F and L.

Along Canadian Northern Railway.

MAP 218

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.	<i>Line F.</i>	Feet.
0.00	P.B.M.—E 16. Warman. Schoolhouse, on east face, southeast corner of foundation wall, on copper plug set in concrete marked "G.S.C., B.M. 35 D".....	1679.880
0.00	Warman Station, at diamond crossing.....	1675.73
0.28	P.B.M.—F 1. Warman. About 500 yds. west of railway station, 2ft. north of Canadian Northern Ry. south right of way fence and about 200 yds. southeast of elevator, on top of bolt set in top of concrete pillar, no marking.....	1676.835
1.62	T.B.M. 2. On 5th telegraph pole west of mileboard 492.....	1681.51
3.57	T.B.M. 4. On 7th telegraph pole west of yard limit board.....	1698.55
4.69	P.B.M.—F 2. 4.7 miles west of Warman station, 2 yds. west of 8th telegraph pole west of mileboard 495, 3 ft. south of northerly right of way fence, on plate on concrete pillar.....	1705.529
5.45	Road crossing, east of sec. 6, tp. 39-5-3.....	1709.30
6.65	Road crossing, east of sec. 12, tp. 39, rge. 6.....	1711.90
6.75	T.B.M. 7. On 10th telegraph pole west of mileboard 497.....	1711.86
7.52	Road crossing, east of sec. 11, tp. 39, rge. 6.....	1718.70
8.56	Road crossing, east of sec. 10 tp. 39, rge. 6.....	1723.80
8.62	Dalmeny station, base of rail.....	1722.40
9.09	P.B.M.—F 3. About 1/2 mile west of Dalmeny station, opposite 2nd telegraph pole east of west Y switch, 14 yds. south of centre of track, on bolt on concrete pillar.....	1719.860
9.82	Road crossing, east of sec. 9, tp. 39, rge. 6.....	1724.60
10.64	Road crossing, east of sec. 8, tp. 39, rge. 6.....	1724.50

WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

ALONG Canadian Northern Railway.

MAP 218

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
11.33	T.B.M. 11. On 2nd telegraph pole east of mile board 502.....	1719.83
11.46	Road crossing, north of sec. 8 tp. 39, rge 6.....	1720.40
11.65	Road crossing, east of sec. 18, tp. 39, rge. 6.....	1719.10
12.30	P.B.M.—F 4. 3.7 miles west of Dalmeny station, opposite 3rd telegraph pole east of mileboard 503, 3 ft. north of southerly right of way fence, on bolt on concrete pillar.....	1713.965
12.68	Road crossing east of sec. 13, tp. 39, rge. 7.....	1711.80
13.27	T.B.M. 13. On 4th telegraph pole east of mileboard 504.....	1707.52
13.71	Road crossing, east of sec. 14, tp. 39, rge. 7.....	1713.20
14.73	Road crossing, east of sec. 15, tp. 39, rge. 7.....	1716.10
15.38	T.B.M. 15. On telegraph pole, mileboard 506.....	1710.96
15.77	Road crossing, east of sec. 16, tp. 39, rge. 7.....	1713.00
16.57	Langham station, base of rail.....	1706.70
16.80	Road crossing, east of sec. 20, tp. 39, rge. 7.....	1704.00
16.99	P.B.M.—F 5. 0.5 miles west of Langham station, 85 ft. east of 12th telegraph pole east of mileboard 508, 44 ft. south of centre of track, on bolt on concrete pillar.....	1700.078
17.82	Road crossing, east of sec. 19, tp. 39, rge. 7.....	1677.30
18.07	T.B.M. 17. On 9th telegraph pole east of mileboard 509.....	1672.76
20.42	T.B.M. 19. On 1st telegraph pole west of mileboard 511.....	1615.14
22.92	T.B.M. 21. On 15th telegraph pole west of mileboard 513.....	1551.72

## WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

## ALONG Canadian Northern Railway.

MAP 218

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
24.20	P.B.M.—F 7. 0.3 miles east of Ceepee station, opposite 8th telegraph pole east of mileboard 515, 176 ft. south of centre of track, on plate on concrete pillar.....	1526.818
24.50	Ceepee station, base of rail.....	1512.30
24.66	Public Works Department B.M. 131. Ceepee. Canadian Northern Ry. bridge over North Saskatchewan river, on copper bolt set in southeasterly face (near north easterly end) of most southeasterly low pier on right bank.....	1465.133
24.66	North Saskatchewan river, water level, June 22, 1912...	1458.5
24.66	North Saskatchewan river, base of rail, over southeasterly pier.....	1509.20
24.89	Public Works Department, Gauge mark. Ceepee. Canadian Northern Ry. bridge over North Saskatchewan river. Pencil mark on northwesterly face (near southwesterly end) of the most northwesterly low concrete pier on left bank of river (used as reference for gauge set in river).....	1465.07
25.11	Public Works Department B.M. 131A. Ceepee. On left bank of North Saskatchewan river on top of large rock on high land, about 500 yds. from water and about 60 yds. east of railway trestle.....	1505.134
25.39	T.B.M. 23. On 4th telegraph pole east of mileboard 516.	1516.57
27.52	T.B.M. 25. On telegraph pole, mileboard 518.....	1581.40
30.03	Road crossing, east of see, 33. tp. 39, rge. 9.....	1632.90
30.66	P.B.M.—F 9. Borden. About 100 yds. east of station, 155 ft. east of mileboard 521, 60 ft. north of centre of track, and 3 ft. south of north right of way fence, on plate on concrete pillar.....	1637.863
30.71	Borden station, base of rail.....	1636.90
33.30	T.B.M. 29. On 11th telegraph pole east of mileboard 524.....	1681.22

WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

ALONG Canadian Northern Railway.

MAPS 218, 268

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
35.84	T.B.M. 31. On 5th telegraph pole east of mileboard 526	1698.44
37.94	P.B.M.—F. 10. Radisson. About 1,200 yds. east of station, 40 ft. west of 8th telegraph pole west of mileboard 528, 3 ft. south of north right of way fence, on plate on concrete pillar.....	1715.991
38.63	Radisson station, base of rail.....	1721.40
39.05	P.B.M.—F 11. Radisson. About 700 yds. west of station, opposite 10th telegraph pole west of mileboard 529, 3 ft. north of south right of way fence, on plate on concrete pillar.....	1719.752
41.28	T.B.M. 35. On 16th telegraph pole west of mileboard 531.....	1734.59
43.47	T.B.M. 37. On 11th telegraph pole east of mileboard 534.....	1745.02
45.89	P.B.M.—F 12. Fielding. About 400 yds. east of railway and 112 yds. west of mileboard 536, 39 yds. of centre of track, on plate on concrete pillar.....	1804.535
46.08	Fielding station, base of rail.....	1808.00
46.44	P.B.M.—F 13. Fielding. About 600 yds. west of station, opposite 13th telegraph pole east of mileboard 537, 3 ft. north of south right of way fence, on plate on concrete pillar.....	1812.101
49.13	T.B.M. 41. On 2nd telegraph pole west of mileboard 540.....	1850.74
51.64	T.B.M. 43. On 10th telegraph pole east of mileboard 542.....	1908.59
53.61	P.B.M.—F 14. Maymont. About 500 yds. east of station, 30 ft. west of 8th telegraph pole east of station, 3 ft. south of north right of way fence and 117 ft. north of centre of track, on plate on concrete pillar.....	1938.330
53.91	Maymont station, base of rail.....	1941.00

## WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

## ALONG Canadian Northern Railway.

MAP 268

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
54.13	P.B.M.—F 15. Maymont. About 380 yds. west of station, 100 ft. west of 3rd telegraph pole west of mileboard 544, 3ft. north of south right of way fence, and 175 ft. south of centre of track, on plate on concrete pillar.....	1941.918
56.31	T.B.M. 46. On 9th telegraph pole west of mileboard 546.....	1929.45
58.54	T.B.M. 48, On 14th telegraph pole west of mileboard 548.....	1909.32
60.70	P.B.M.—F 16. Ruddell. About 250 yds. east of station, opposite 5th telegraph pole east of station, 3 ft. north of south right of way fence, and 116 ft. south of centre of track, on plate on concrete pillar...	1892.454
60.84	Ruddell station, base of rail.....	1893.20
61.13	P.B.M.—F 17. Ruddell. About 500 yds. west of station, 187 ft. east of mileboard 551, 5 ft. south of north right of way fence, and 176 ft. north of centre of track, on plate on concrete pillar.....	1891.647
63.32	T.B.M. 51. On 5th telegraph pole west of mileboard 553.....	1856.36
65.53	T.B.M. 53. On 10th telegraph post west of mileboard 555.....	1820.82
68.22	P.B.M.—F 18. Denholm. About 400 yds. east of station, 80 ft. east of mileboard 558, 3 ft. north of south right of way fence, and 50 ft. south of centre of track, on plate on concrete pillar.....	1804.366
68.47	Denholm station, base of rail.....	1804.90
68.68	P.B.M.—F 19. Denholm. About 370 yds. west of station, 100 ft. west of 13th telegraph pole west of mileboard 558, 3 ft. south of north of right way fence and 120 ft. north of centre of track, on plate on concrete pillar.....	1802.013
71.05	T.B.M. 56. On 8th telegraph pole east of mileboard 561.....	1787.31



Photo by L. O. R. Dozier, D.L.S.  
P.B.M.—Q 30 on Canadian Northern Railway bridge over Assiniboine river.



Photo by L. O. R. Dozier, D.L.S.  
An instrument station, Precise Levelling.

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LEVELLING OPERATIONS

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WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

ALONG Canadian Northern Railway.

MAP 267

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
73.80	T.B.M. 58. On 14th telegraph pole west of mileboard 563.....	1747.20
76.86	P.B.M.—F. 20. Brada. About 500 yds. east of station, 45 ft. east of 19th telegraph pole east of mileboard 567, 3 ft. south of north right of way fence, and 45 ft. north of centre of track, on plate on concrete pillar.....	1706.819
77.14	Brada station, base of rail.....	1709.40
77.46	P.B.M.—F 21. Brada. About 560 yds. west of station, opposite 1st telegraph pole west of mileboard 567, 3 ft. south of north right of way fence, and 177 ft. north of centre of track, on plate on concrete pillar.	1710.531
79.91	T.B.M. 61. On 14th telegraph pole west of mileboard 569.....	1674.26
82.46	Public Works Department B.M. 110. North Battleford highway bridge, mark cut on northeast abutment...	1540.667
82.48	P.B.M.—F 22. North Battleford. About 1,330 yds. east of station, 50 ft. west of 2nd telegraph pole east of mileboard 572, 3 ft. south of north right of way fence, 150 ft. north of centre of track, on plate on concrete pillar.....	1680.244
83.20	North Battleford station, base of rail.....	1687.10
83.60	P.B.M.—F 23. North Battleford. About 630 yds. west of station, opposite 4th telegraph pole west of mileboard 573, 3 ft. north of south right of way fence, 45 ft. south of centre of track, on plate on concrete pillar.....	1683.13
86.35	T.B.M. 65. On 10th telegraph pole east of mileboard 576.....	1624.72
88.48	Public Works Department B.M. 105. North Battleford. 500 yds. south of southeast end of Canadian Northern Ry. bridge over North Saskatchewan river, and about 200 yd. northwest of Canadian Northern Ry. track, on a high poplar stump, painted white....	1586.712

## TOPOGRAPHICAL SURVEYS BRANCH

## WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

## ALONG Canadian Northern Railway.

MAP 167

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
88.66	T.B.M. 67. On 1st telegraph pole east of mileboard 578.....	1590.00
88.84	P.B.M.—F 25. North Battleford. Canadian Northern Ry. bridge over North Saskatchewan river, on top of northeasterly end of most southeasterly high concrete pier, mark cut in concrete and painted "T.S. B.M. 25"	1585.314
89.47	P.B.M.—F 26. Battleford Junction. About 75 yds. south, along main line, from Junction with old Battleford line, and about 27 yds. west from main track, and 4 ft. east of west right of way fence, on plate on concrete pillar marked "T.S. B.M.".....	1601.227
91.70	T.B.M. 69. On 1st telegraph pole east of mileboard 581.....	1679.14
94.15	P.C.M.—F 27.—Highgate. About one-eighth mile east of section house, 40 ft. west of 13th telegraph pole west of mileboard 583, 3 ft. south of north right of way fence, and 115 ft. north of centre of track, on plate on concrete pillar.....	1772.517
	(Highgate station.)	
94.61	P.B.M.—F 28. Highgate. West of section house, 60 ft. west of 6th telegraph pole east of mileboard 584, 3 ft. north of south right of way fence, on plate on concrete pillar.....	1782.889
96.79	T.B.M. 73. On 1st telegraph pole east of mileboard 586.....	1815.53
98.97	T.B.M. 75. On 4th telegraph pole west of mileboard 588.....	1825.16
101.31	T.B.M. 77. On 11th telegraph pole west of mileboard 590.....	1827.19
102.48	P.B.M.—F 29. Delmas. About 390 yds. east of station, 75 ft. east of 5th telegraph pole east of water tank at Delmas station, 3 ft. south of north right of way fence, and 150 ft. north of centre of track, on plate on concrete pillar.....	1827.744

LEVELLING OPERATIONS

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WARMAN TO EDMONTON.

Precise Level Lines F. and L.

ALONG Canadian Northern Railway.

MAP 267

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
102.70	Delmas station, base of rail.....	1825.00
102.93	P.B.M.—F 30. Delmas. About 400 yds. west of station, 65 ft. east of 3rd telegraph pole east of mileboard 592, 3 ft. north of south right of way fence, and 47 ft. south of centre of track, on plate on concrete pillar.....	1821.032
105.27	T.B.M. 79. On 6th telegraph pole west of mileboard 594.....	1789.34
105.52	T.B.M. 81. On 13th telegraph pole west of mileboard 596.....	1784.80
109.88	P.B.M.—F 31. (Destroyed.)	
110.02	Bresaylor station, base of rail.....	1804.00
110.25	P.B.M.—F 32. Bresaylor. About 400 yds. west of station, 30 ft. east of 3rd telegraph pole west of mileboard 599, 3 ft. south of north right of way fence, and 100 ft. north of centre of track, on plate on concrete pillar.....	1805.300
112.08	T.B.M. 85. On 4th telegraph pole east of mileboard 601.....	1824.07
114.45	T.B.M. 87. On 7th telegraph pole west of mileboard 603.....	1834.77
116.63	T.B.M. 89. On 12th telegraph pole west of mileboard 605.....	1849.21
117.61	P.B.M.—F 33. Paynton. About 460 yds. east of station, 90 ft. from 10th telegraph pole west of mileboard 606, 3 ft. north of south right of way fence, and 47 ft. south of centre of track, on plate on concrete pillar.....	1852.95
117.87	Paynton station, base of rail.....	1853.80
118.12	P.B.M.—F 34. Paynton. About 440 yds. west of station, 50 ft. east of 5th telegraph pole east of mileboard 607, 3 ft. south of north right of way fence, and 100 ft. north of centre of track, on plate on concrete pillar.....	1850.945

73075—19½

## TOPOGRAPHICAL SURVEYS BRANCH

## WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

## ALONG Canadian Northern Railway.

MAP 267

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
120.36	T.B.M. 91. On 1st telegraph pole west of mileboard 609.....	1843.67
122.62	T.B.M. 93. On 8th telegraph pole west of mileboard 611.....	1838.84
124.80	T.B.M. 95. On 13th telegraph pole west of mileboard 613.....	1839.98
126.22	P.B.M.—F 35. Birling. About 540 yds. east of station, and 90 ft. east of 6th telegraph pole east of mileboard 616, 3 ft. south of north right of way fence, and 45 ft. north of centre of track, on plate on concrete pillar.....	1853.491
127.53	Birling station, base of rail.....	1853.00
127.75	P.B.M.—F 36. Birling. About 390 yds. west of station, opposite 11th telegraph pole east of mileboard 616, 3 ft. south of north right of way fence, and 100 ft. north of track, on plate on concrete pillar.....	1851.680
129.11	T.B.M. 99. On 12th telegraph pole east of mileboard 619.....	1864.94
131.62	T.B.M. 101. On 4th telegraph pole west of mileboard 621.....	1910.04
132.77	P.B.M.—F 37. Maidstone. About 600 yds. east of station, 50 ft. west of 9th telegraph pole west of mileboard 622, 3 ft. south of north of right way fence, and 45 ft. north of centre of track, on plate on concrete pillar.....	1934.676
133.10	Maidstone station, base of rail.....	1940.80
133.53	P.B.M.—F 38. Maidstone. About 800 yds. west of station, 45 ft. east of 2nd telegraph pole west of mileboard 623, 3 ft. north of south right of way fence, and 45 ft. south of centre of track, on plate on concrete pillar.....	1945.854
135.31	T.B.M. 103. On 6th telegraph pole east of mileboard 625.....	1991.55

WARMAN TO EDMON.

*Precise Level Lines F. and L.*

ALONG Canadian Northern Railway

MAP 267

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
137.60	T.B.M. 105. On 4th telegraph pole west of mileboard 627.....	2053.64
139.55	T.B.M. 107. On 2nd telegraph pole west of mileboard 629.....	2087.19
140.56	P.B.M.—F 39. Waseca. About 420 yds. east of station, 30 ft. east of 3rd telegraph pole west of mileboard 630, 3 ft. south of north right of way fence, and 45 ft. north of centre of track, on plate on concrete pillar.....	2104.930
140.77	Waseca station, base of rail.....	2106.10
141.11	P.B.M.—F 40. Waseca. About 540 yds. west of station, 30 ft. east of 10th telegraph pole west of station house, 3 ft. north of south right of way fence, and 150 ft. south of centre of track, on plate on concrete pillar.....	2102.375
143.12	T.B.M. 109. On 13th telegraph pole east of mileboard 633.....	2098.58
145.05	T.B.M. 111. On 18th telegraph pole west of mileboard 634.....	2062.54
147.21	P.B.M.—F 41. Lashburn. About 510 yds. east of station, 15 ft. west of 8th telegraph pole east of mileboard 637, 3 ft. north of south right of way fence, and 47 ft. south of centre of track, on plate on concrete pillar.....	2019.038
147.50	Lashburn station, base of rail.....	2019.35
147.84	P.B.M.—F 42. Lashburn. About 600 yds. west of station, 70 ft. west of 10th telegraph pole west of mileboard 637, 3 ft. south of north right of way fence, and 47 ft. north of centre of track, on plate on concrete pillar.....	2016.405
149.80	T.B.M. 114. On 9th telegraph pole west of mileboard 639.....	2004.28
151.47	T.B.M. 116. On 1st telegraph pole east of mileboard 641.....	1999.98

## WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

## ALONG Canadian Northern Railway.

MAP 317

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
153.63	T.B.M. 118. On 4th telegraph pole west of mileboard 643.....	1995.21
155.78	Marshall station, base of rail.....	2015.30
155.98	P.B.M.—F 44. Marshall. About 350 yds. west of station, 65 ft. east of 17th telegraph pole east of mileboard 646, 3 ft. south of north right of way fence, and 45 ft. north of centre of track, on plate on concrete pillar.....	2018.544
157.41	T.B.M. 121. On 3rd telegraph pole east of mileboard 647.....	2028.19
149.54	T.B.M. 123. On 1st telegraph pole west of mileboard 649.....	2038.10
161.46	T.B.M. 125. On 2nd telegraph pole east of mileboard 651.....	2040.67
162.02	Aberfeldy station, base of rail.....	2034.80
163.41	T.B.M. 127. On 3rd telegraph pole east of mileboard 653.....	2040.23
165.41	T.B.M. 129. On 4th telegraph pole east of mileboard 655.....	2078.58
167.24	P.B.M. F 45. Lloydminster. About 700 yds. east of station, 110 ft. east of 7th telegraph pole east of mileboard 657, 3 ft. north of south right of way fence, and 45 ft. south of centre of track, on plate on concrete pillar.....	2108.986
167.60	Lloydminster station, base of rail.....	2120.90
	B.M. B 1. On southwest corner of top of lowest concrete step, main entrance to Royal George Hotel, Lloydminster, unmarked.....	2123.446
	B.M. B 2. On northwest corner of top of concrete step, main entrance Northern Crown Bank, Lloydminster, unmarked.....	2125.980
	B.M. B 3. On southeast corner of top of concrete pillar, about 2½ ft. square, 4 ft. high, standing about 60 ft. south of Canadian Northern Ry. track, and about 300 ft. west of Lloydminster station, unmarked.....	2125.072

WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

ALONG Canadian Northern Railway.

MAP 316

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
168.14	P.B.M.—F 46. Lloydminster. About 880 yds. west of station, 65 ft. east of 11th telegraph pole east of mileboard 658, 3 ft. south of north right of way fence, and 45 ft. north of centre of track, on plate on concrete pillar.....	2126.000
<i>Line L.</i>		
169.85	Bridge 659.3. On nail at north end of middle cap beam	2171.83
172.57	T.B.M. 134. On 2nd telegraph pole west of mileboard 662	2202.19
174.34	P.B.M.—L 47. Blackfoot. About 560 yds. east of station, 75 ft. east of 5th telegraph pole east of mileboard 664, 3 ft. south of north right of way fence, and 47 ft. north of centre of track, on plate on concrete pillar.....	2226.505
174.67	Blackfoot station, base of rail.....	2223.35
174.93	Road crossing, east of sec. 2, tp. 50-2-4.....	2224.07
174.93	P.B.M.—L 46. Blackfoot. About 460 yds. west of station, 60 ft. east of 18th telegraph pole east of mileboard 665, 5 ft. north of south right of way fence, and 45 ft. south of centre of track, on plate on concrete pillar.....	2222.561
176.99	T.B.M. 137. On 15th telegraph pole west of mileboard 666.....	2242.53
177.24	Road crossing, east of sec. 9, tp. 50, rge. 2.....	2249.29
179.02	P.B.M.—L 45. About 3.6 miles east of Kitscoty. About midway between 17th and 18th telegraph poles east of mileboard 669, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2235.194
180.07	T.B.M. 140. On 18th telegraph pole west of mileboard 669.....	2217.83
182.05	P.B.M.—L 44. Kitscoty. About 740 yds. east of station, 65 ft. east of 16th telegraph pole east of station building, 5 ft. south of north right of way fence, on plate on concrete pillar.....	2206.019

## WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

## ALONG Canadian Northern Railway.

MAP 316

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
182.55	Kitseoty station, base of rail.....	2198.93
183.09	Road crossing, east of sec. 27, tp. 50, rge. 3.....	2207.93
184.15	Bridge 673.8, on nail at south end of east cap beam....	2195.14
185.28	T.B.M. 144. On 7th telegraph pole east of mileboard 675.....	2171.79
187.16	P.B.M.—L 43. 5.7 miles east of Islay. 9 ft. west of 13th telegraph pole east of mileboard 677, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2123.39I
188.07	Bridge 677.7, on nail at north end of east cap beam....	2091.05
189.10	T.B.M. 148. On nut at east end of top beam, bridge 678.5.....	2072.53
190.16	Road crossing, east of sec. 11, tp. 51, rge. 4.....	2044.89
191.51	Bridge 680.8, on nail at north end of west cap beam....	2008.94
192.60	P.B.M.—L 42. Islay. About 530 yds. east of station, 45 ft. west of 2nd telegraph pole west of mileboard 682, 5 ft. north of south right of way fence, and 45 ft. south of centre of track, on plate on concrete pillar..	2001.326
192.90	Islay station, base of rail.....	2000.48
193.25	P.B.M.—L 41. Islay. About 560 yds. west of station, 45 ft. east of 9th telegraph pole east of mileboard 683, 5 ft. south of north right of way fence, and 45 ft. north from centre of track, on plate in concrete pillar	2001.356
195.20	Bridge 684.9, on nail at north end of east cap beam....	2006.31
196.92	Bridge 686.4, on nail at south end of west cap beam....	2001.82
197.11	P.B.M.—L 40. About 3.7 miles east of Borrodaile station, 40 ft. west of 14th telegraph pole east of mileboard 687, 3 ft. north of south right of way fence on bolt set in concrete in pipe.....	2004.25I
198.85	Bridge 688.3, on nail at south end of middle cap beam.	2020.75

WARMAN TO EDMONTON

*Precise Level Lines F. and L.*

ALONG Canadian Northern Railway.

MAP 316

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
200.18	P.B.M.—L 38. Borrodaile. 450 yds. east of station, 12 ft. west of 11th telegraph pole east of mileboard 690, 33 ft. north of centre of track, on bolt set in concrete in pipe.....	2036.263
200.36	P.B.M.—L 39. Borrodaile. About 300 yds. east of station, opposite 6th telegraph pole east of mileboard 690, 3 ft. north of south right of way fence, on bolt set in concrete pillar.....	2031.114
200.44	Borrodaile station, base of rail.....	2040.07
200.87	P.B.M.—L 37. Borrodaile. 750 yds. west of station, 63 ft. west of 10th telegraph pole west of mileboard 690, 3 ft. south of north right of way fence, on bolt set in concrete pillar.....	2042.455
201.94	Bridge 691.6, on nail at north end of middle cap beam..	2034.69
203.10	P.B.M.—L 36. About 4.7 miles east of Vermilion. 30 ft. east of 15th telegraph pole east of mileboard 693, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2027.867
205.17	T.B.M.—266. On 14th telegraph pole east of mileboard 695.....	2005.52
206.99	P.B.M.—L 35. Vermilion. 750 yds. north of station building. School, south side of building, southeast corner of wing, about 2 ft. north and 1 ft. above ground copper plug.....	2023.379
207.72	Vermilion station, base of rail.....	2030.36
208.20	Bridge. On nail at south end of middle cap beam.....	2018.80
209.40	T.B.M. 262. On 6th telegraph pole east of mileboard 699.....	2023.51
210.76	Bridge 700.1, on nail at south end of middle cap beam..	2030.16
211.28	P.B.M.—L 34. About 2½ miles west of Vermilion. Midway between 10th and 11th telegraph poles east of mileboard 701, 3 ft. north of south right of way fence, on bolt set in concrete in pipe.....	2043.668

## WARMAN TO EDMONTON

*Precise Level Lines F. and L.*

## ALONG Canadian Northern Railway.

MAP 316

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
212.25	Road crossing, east of sec. 33, tp. 50, rge 7.....	2065.34
213.46	T.B.M. 259. On 5th telegraph pole east of mileboard 703	2061.59
215.16	Claysmore station, base of rail.....	2068.48
215.34	Road crossing, east of sec. 25, tp. 50, rge 8.....	2069.75
215.51	P.B.M.—L 33. Claysmore. About 600 yds. west of station, 65 ft. west of 4th telegraph pole east of mileboard 705, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2071.738
216.60	T.B.M. 257. On 1st telegraph pole east of mileboard 706	2048.69
218.24	Road crossing, sec. 22, tp. 50, rge. 8, Edmonton-Battleford trail.....	2029.48
218.59	P.B.M.—L 32. About 3.7 miles east of Mannville. 40 ft. east of 1st telegraph pole east of mileboard 708, 3 ft. north of south right of way fence. on bolt set in concrete in pipe.....	2021.337
219.64	T.B.M. 255. On mileboard telegraph pole 709.....	2043.87
221.99	P.B.M.—L 31. Mannville. About 600 yds. east of station, opposite 12th telegraph pole east of station building, 3 ft. north of south right of way fence, on bolt set in concrete in pipe.....	2050.277
222.36	Mannville station, base of rail.....	2053.79
223.15	T.B.M. 253. On 16th telegraph pole east of mileboard 713.....	2053.30
224.71	Road crossing, east of sec. 27, tp. 50, rge. 9.....	2059.28
225.39	T.B.M. 251 On 8th telegraph pole east of mileboard 715	2061.86
226.41	P.B.M.—L 30. About 4½ miles east of Minburn. 30 ft. west of 8th telegraph pole east of mileboard 716, 3 ft. north of south right of way fence, on bolt set in concrete in pipe.....	2058.152
227.37	T.B.M. 250. On 9th telegraph pole east of mileboard 717	2052.39

WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

ALONG Canadian Northern Railway.

MAP 316

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
229.06	Bridge 718.3. On nail at north end of middle cap beam	2071.28
230.96	Minburn station, base of rail.....	2087.5
231.28	Road crossing, east of sec. 15, tp. 50, rge. 10.....	2090.93
231.5	3.M.—L 29. Minburn. About 550 yds. west of station, at 10th telegraph pole west of mileboard 720, 3 ft. north of south right of way fence, on bolt set in concrete in pipe.....	2090.042
233.48	T.B.M. 245. On 16th telegraph pole east of mileboard 723.....	2107.13
235.52	P.B.M.—L 28. About 4¼ miles east of Innisfree. Midway between 13th and 14th telegraph poles east of mileboard 725, 3 ft. north of south right of way fence, on bolt set in concrete in pipe.....	2148.745
237.46	Bridge 726.4. On nail at north end of middle cap beam	2174.37
238.29	Road crossing, east of sec. 2, tp. 51, rge. 11.....	2191.54
239.64	Road crossing, east of sec. 3, tp. 51, rge. 11.....	2229.55
239.65	Innisfree station, base of rail.....	2229.65
239.72	P.B.M.—L 27. Innisfree. About 200 yds. south of station. Bank of Commerce, north end of east foundation wall, about 2 ft. above ground, copper plug....	2235.043
240.84	T.B.M. 239. On 4th telegraph pole east of mileboard 730.....	2223.71
242.48	Bridge 731.4. On nail at south end of east cap beam..	2201.58
243.11	P.B.M.—L 26. About 4¼ miles east of Ranfurly station. Midway between 3rd and 4th telegraph poles west of mileboard 732, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2191.236
245.71	Bridge 734.7. On nail at south end of middle cap beam	2153.52
247.34	Ranfurly station, base of rail.....	2151.86

## WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

## ALONG Canadian Northern Railway.

MAP 316

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
247.82	P.B.M.—L 25. Ranfurly. About 850 yds. west of station, midway between 6th and 7th telegraph poles east of mileboard 737, 3 ft. north of south right of way fence, on bolt set in concrete in pipe.....	2162.892
248.26	Road crossing, east of sec. 21, tp. 51, rge. 12.....	2169.75
248.76	Bridge 737.9. On nail at north end of west cap beam..	2185.88
250.08	Bridge 739.0. On nail north end of east cap beam.....	2216.26
251.57	P.B.M.—L 24. About 4.7 miles east of Lavoy. 50 ft. west of 15th telegraph pole east of mileboard 741, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2252.974
252.73	Bridge. On nail at north end of west cap beam.....	2231.69
253.84	T.B.M. 229. On 6th telegraph pole east of mileboard 743.....	2215.27
254.36	Bridge 743.3. On nail at north end of east cap beam...	2204.71
254.96	Road crossing, east of sec. 33, tp. 51, rge. 13.....	2204.86
256.00	P.B.M.—L 23. Lavoy. 550 yds. east of station building, 8 ft. east of 1st telegraph pole east of mileboard 745, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2202.908
256.32	Lavoy station, base of rail.....	2202.66
258.15	T.B.M. 226. On 4th telegraph pole west of mileboard 747.....	2207.30
259.70	Road crossing, north of sec. 12, tp. 52, rge. 14.....	2197.41
260.28	P.B.M.—L 22. About 5 miles east of Vegreville. 20 ft. west of 8th telegraph pole west of mileboard 749, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2183.297
262.63	T.B.M. 222. On 13th telegraph pole east of mileboard 752.....	2118.53
262.86	Road crossing, north of sec. 9, tp. 52, rge. 14.....	2115.29

LEVELLING OPERATIONS

WARMAN TO EDMONTON

*Precise Level Lines F. and L.*

ALONG Canadian Northern Railway.

MAPS 315, 316

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
264.46	Road crossing, north of sec. 17, tp. 52, rge. 14.....	2083.57
264.66	P.B.M.—L 21. Vegreville. 1000 yds. east of station, 45 ft. east of 14th telegraph pole east of mileboard 754, 3 ft. north of south right of way fence, on bolt set in concrete in pipe.....	2081.946
264.74	Vermilion river, water, 2068.50; on nail at south end of cap beam.....	2081.01
265.23	Vegreville station, base of rail.....	2083.30
266.04	Road crossing, east of section 24, tp. 52, rge. 15.....	2090.77
266.14	Vegreville. switch point, Calgary line.....	2091.25
266.71	T.B.M. 220. On telegraph pole east of mileboard 756.....	2081.67
267.47	Road crossing, east of sec. 23, tp. 52, rge. 15.....	2099.89
268.58	P.B.M.—L 20. About 3.6 miles southeast of Raith. 15 ft. east of 15th telegraph pole east of mileboard 758, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2116.444
268.81	Bridge 757.7. On nail at south end of east cap beam..	2110.86
269.64	T.B.M.—218. On 13th telegraph pole east of mileboard 759.....	2131.55
271.86	P.B.M.—L 19. Raith. About 565 yds. east of station, midway between 6th and 7th telegraph poles east of mileboard 761, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2167.569
272.18	Raith station, base of rail.....	2169.93
273.87	T.B.M. 215. On 5th telegraph pole east of mileboard 763.....	2194.31
274.47	Bridge 763.4. On nail at north end of middle cap beam.....	2194.92

## WARMAN TO EDMONTON

*Precise Level Lines F. and L.*

## ALONG Canadian Northern Railway.

MAP 315

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
275.67	P.B.M.—L 18. About $3\frac{1}{4}$ miles southeast of Mundare. 95 ft. east of 12th telegraph pole east of mileboard 765, 3 ft. north of south right of way fence, on bolt set in concrete in pipe.....	2212.744
276.65	T.B.M. 213. On 13th telegraph pole east of mileboard 766	2227.39
278.68	P.B.M.—L 17. Mundare. 750 yds. east of station building, 16 ft. east of 14th telegraph pole east of Mundare station, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2259.145
279.05	Mundare station, base of rail.....	2255.16
279.91	Road crossing, north of sec. 19, tp. 53, rge. 16.....	2237.85
280.09	T.B.M. 210. On 1st telegraph pole west of mileboard 769.....	2239.12
281.68	Bridge 770.7. On nail at north end of west cap beam..	2248.00
282.04	P.B.M.—L 16. About 4.1 miles southeast of Hilliard. At 3rd telegraph pole west of mileboard 771, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2257.587
284.18	T.B.M. 206. On 4th telegraph pole west of mileboard 773.....	2263.50
284.89	Bridge 773.8. On nail at south end of east cap beam..	2280.19
286.13	Hilliard station, base of rail.....	2275.56
286.44	P.B.M.—L 15. Hilliard. 550 yds. west of station board, 35 ft. west of 4th telegraph pole west of mileboard 775, 3 ft. south of north right of way fence, top of iron pipe filled with concrete.....	2268.792
288.55	T.B.M. 202. On 5th telegraph pole west of mileboard 777.....	2215.37
290.21	P.B.M.—I. 14. About $3\frac{1}{4}$ miles east of Chipman. Midway between 3rd and 4th telegraph poles east of mileboard 779, 3 ft. north of south right of way fence, on bolt set in concrete in pipe.....	2197.500

WARMAN TO EDMONTON

*Precise Level Lines F. and L.*

ALONG Canadian Northern Railway.

MAP 315

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
291.23	Beaverhills Creek, water, 2175.76; on nail at north end of east beam...	2189.30
292.47	T.B.M. 198. On 2nd telegraph pole west of mileboard 781.....	2187.95
293.48	Road crossing, east of sec. 30, tp. 54, rge. 18.....	2197.84
293.66	Chipman station, base of rail.....	2197.00
294.36	P.B.M.—L 13. Chipman. About $\frac{3}{4}$ mile west of station, 90 ft. east of mileboard 783, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2188.720
295.35	T.B.M. 195. On 2nd telegraph pole east of mileboard 784.....	2169.34
296.34	Bridge 784.9. On nail at north end of west cap beam..	2163.05
297.19	P.B.M.—L 12. About 4 miles east of Lamont. 7 ft. west of 3rd telegraph pole southeast of mileboard 786, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2168.324
298.91	Bridge 787.4. On nail at north end of east cap beam..	2153.29
300.99	P.B.M.—L 11. Lamont. Opposite station building, D. R. Davis Co, Ltd., Elevator, west end of north foundation wall, copper plug set in concrete.....	2139.684
300.92	Lamont station, base of rail.....	2140.55
302.34	Bridge 790.9. On nail at north end of middle cap beam.....	2125.56
304.23	Road crossing, east boundary of section 26, tp. 55, rge. 20.....	2134.20
304.39	P.B.M.—L 10. About 3 miles east of Bruderheim. About 70 ft. east of mileboard 793, 3 ft. north of south right of way fence, on bolt set in concrete in pipe.....	2140.499
306.30	T.B.M. 184. On 3rd telegraph pole east of mileboard 795.....	2095.39

## WARMAN TO EDMONTON

*Precise Level Lines F. and L.*

## ALONG Canadian Northern Railway.

MAP 315

Distance from Warman Station.	Locality and Description.	Elevation
Miles.		Feet.
307.64	P.B.M.—L 9. Bruderheim. About 35 yds. east of station, elevator of Gillespie Elevator Company, east end of north foundation wall, about 9 inches above ground, copper plug.....	2076.2
307.66	Bruderheim station, base of rail.....	2075.5
308.94	Bridge 797.5. On nail at north end of west cap beam..	2058.1
309.29	Road crossing, E. by. sec. 36, tp. 55, rge. 21.....	2074.1
310.48	T.B.M. 180. On 2nd telegraph pole west of mileboard 799.....	2067.8
311.42	P.B.M.—L 8. About $3\frac{1}{4}$ miles north of Scotford. About 45 ft. west of 6th telegraph pole west of mileboard 800, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2069.30
311.99	Road crossing, E. by. sec. 27, tp. 55, rge. 21.....	2070.88
312.45	T.B.M. 178. On 1st telegraph pole west of mileboard 801.....	2072.03
314.22	Bridge 802.7, water.....	2052.80
314.32	P.B.M.—L 7. Scotford. 520 yds. east of station building, at mileboard 803, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2064.05
314.38	T.B.M. 176. On 1st telegraph pole east of mileboard 803.....	2061.51
314.67	Scotford station, base of rail.....	2068.33
316.39	T.B.M. 174. On 1st telegraph pole east of mileboard 805	2070.04
317.32	Road crossing, east of sec. 12, tp. 55, rge. 22.....	2070.00
317.74	P.B.M.—L 6. About 4 miles northeast of Fort Saskatchewan. About 100 ft. west of mileboard 806, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2063.438
318.58	Road crossing, E. by. of sec. 11, tp. 55, rge. 22.....	2063.28

Elevation.  
Feet.  
2076.291  
2075.53  
2058.12  
2074.19  
2067.86



Photo by L. O. R. Dozors, D.L.S.  
P.B.M.—Q 32 on court-house, Portage-la Prairie, Manitoba.

2069.300  
2070.88  
2072.03  
2052.80  
2061.055  
2061.51  
2068.33  
2070.04  
2070.00



Photo by L. O. R. Dozors, D.L.S.  
P.B.M.—Q 32A on house owned by E. W. Yuill, Townline, Manitoba.

063.438  
063.28



WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

ALONG Canadian Northern Railway.

MAP 315

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
318.91	T.B.M. 172. On 1st telegraph pole east of mileboard 807.....	2062.59
320.89	Ross creek, water, 2013.70; base of rail.....	2041.20
	Ross creek. On nail at south end of west cap beam....	2038.95
321.58	P.B.M.—L 5. Fort Saskatchewan. About 350 yds. east of station, east end of south foundation wall of School House in lot 9, about 15 inches above ground, copper plug.....	2050.950
321.77	Fort Saskatchewan station, base of rail.....	2049.03
323.11	North Saskatchewan river, water level, September 3rd, 1914.....	1969.80
323.11	Public Works Department B.M. 9. Fort Saskatchewan. On Canadian Northern Railway bridge over North Saskatchewan river, on northeast face of most westerly pier, about 3 ft. above ground, on mark painted black	1986.202
323.11	P.B.M.—L 4. Fort Saskatchewan. Canadian Northern Railway bridge over North Saskatchewan river, on top of north end of most westerly concrete pier, on top of brass plate.....	2007.162
323.11	T.B.M. 168. On bolt 165 yds. west of the east end of Canadian Northern Railway bridge, Fort Saskatchewan, west side of bridge.....	2046.37
324.99	Road crossing, surveyed trail, sec. 25, tp. 54, rge. 23...	2070.90
325.59	Bridge 813.0. On nail at north end of east cap beam..	2086.46
326.67	Bridge 814.1, water, 2046.90; base of rail.....	2113.35
326.67	Bridge 814.1. On nail at south end of west cap beam..	2112.02
327.43	River Bend station, base of rail.....	2117.65
327.47	P.B.M.—L 3. River Bend. 65 yds. west of station building, about 10 ft. west of 3rd telegraph pole east of mileboard 815, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2116.444

## WARMAN TO EDMONTON.

*Precise Level Lines F. and L.*

## ALONG Canadian Northern Railway.

MAP 315

Distance from Warman Station.	Locality and Description.	Elevation.
Miles.		Feet.
329.68	T.B.M. 162. On 1st telegraph pole west of mileboard 817.....	2139.14
331.15	Horsehills creek, water, 298 ft. base of rail.....	2146.00
331.50	Oliver station, base of rail.....	2144.95
331.69	Road crossing, north of sec. 31, tp. 5, rge. 23.....	2142.00
331.89	P.B.M.—L 2. Oliver. 690 yds. west of station building, about 40 ft. west of 7th telegraph pole west of mileboard 819, 3 ft. south of north right of way fence, on bolt set in concrete in pipe.....	2139.517
333.59	T.B.M. 158. On 2nd telegraph pole east of mileboard 821.....	2136.03
334.57	Road crossing, north of sec. 24, tp. 53, rge. 24.....	2142.00
336.05	City of Edmonton B.M. 8. North Edmonton. On Canadian Northern Railway right of way. About 330 yds. east of east line of Norton street, 3 ft. south of north right of way fence, marked "Elevation 192.66".....	2149.563
337.31	Road crossing, Alberta avenue.....	2168.80
338.24	Rat creek, water, 2126.50; base of rail.....	2171.90
339.42	P.B.M.—L 1. Edmonton. Queen's Avenue school building, northwest corner, north face of window sill, about 3 inches above ground, copper plug.....	2187.215
342.04	City of Edmonton B.M. 12. On Grand Trunk Pacific Ry. right of way, 130 yds. west of west side of Namayo Ave., 1 ft. south of north right of way fence, marked "Elevation 237.32".....	2194.150

## PRINCE ALBERT TO HUDSON BAY JUNCTION.

*Precise Level Line G.*

## ALONG Canadian Northern Railway.

MAP 319, 269

Distance from Prince Albert Post Office.	Locality and Description.	Elevation.
Miles.		Feet.
0.20	Prince Albert station, Canadian Northern Ry., base of rail.....	1413.30
1.12	P.B.M.—G 1. Prince Albert. On Canadian Northern Ry right of way, about 300 yds. east of crossing of Sixth avenue east, 2 ft. north of the south right of way fence, and about 48 ft. south of centre of track, on top of plate on concrete pillar.....	1419.321
3.82	Grand Trunk Pacific Ry. B.M.—On spike in Canadian Northern Ry. telegraph pole at mileboard 357, about 50 ft. northwest of the intersection of the centre lines of the two railways, pole marked "G.T.P., B.M., 1505.52."	1501.86
9.60	Davis station, base of rail.....	1492.02
9.80	P.B.M.—G 3. Davis. About 240 yds. east of station building, 6 ft. south of north right of way fence, and about 105 ft. north of centre of track, on plate on concrete pillar.....	1492.158
16.47	P.B.M.—G 5. (Indian Reserve). Canadian Northern Ry. bridge over South Saskatchewan river, $\frac{1}{2}$ mile northwest of Fenton station, on top of plate set in top of middle of most northerly concrete pier, marked "T.S. B.M.".....	1422.849
16.50	South Saskatchewan river, water, Dec. 11, 1914. ....	1378.34
17.27	Fenton station, base of rail.....	1459.51
17.47	P.B.M.—G 6. (Indian Reserve). Fenton. About 360 yds. southeast of Fenton station building, 2 ft. south of north right of way fence and about 120 ft. north of centre of track, on plate on concrete pillar.....	1457.690
25.65	Birch Hills station, base of rail.....	1506.23
25.86	P.B.M.—G 8. Birch Hills. About 320 yds. east of station building, 2 ft. south of north right of way fence, and about 120 ft. north of centre of track, on plate on concrete pillar.....	1501.257
33.18	Branspeth station, base of rail.....	1483.51

73075—20½

## PRINCE ALBERT TO HUDSON BAY JUNCTION.

*Precise Level Line G.*

## ALONG Canadian Northern Railway.

MAP 269

Distance from Prince Albert Post Office.	Locality and Description.	Elevation.
Miles.		Feet.
33.35	P.B.M.—G 10. Branspeth. About 220 yds. east of waiting room, 5 ft. south of north right of way fence, and about 115 ft. north of centre of track, on plate on concrete pillar.....	1484.299
38.02	Weldon station, base of rail.....	1495.72
38.06	P.B.M.—G 12. Weldon. (Destroyed.)	
43.90	P.B.M.—G 14. Kinistino. About 500 yds. west of station building, and 170 ft. south of centre of track, 60 ft. west of mileboard 317, on plate on concrete pillar	1515.340
43.97	P.B.M.—G 15. Kinistino. School-house, on west face in third row of brickwork, about 5 ft. above ground, 3 ft. 4 ins. from south west corner, mark ↑ ..	1524.749
44.76	Kinistino station, base of rail.....	1518.06
54.21	P.B.M.—G 16. Beatty. About 560 yds. west of station building, 4 ft. north of south right of way fence, and about 180 ft. south of centre of track, on plate on concrete pillar.....	1486.475
54.53	Beatty station, base of rail.....	1489.41
62.74	P.B.M.—G 18. Melfort. About 280 yds. west of station building, 3 ft. south of north right of way fence, and about 45 ft. north of centre of track, on plate on concrete pillar.....	1515.713
62.86	Melfort Station, base of rail.....	1518.08
69.62	P.B.M.—G 20. Naisberry. About 66 yds. west of station building, 3 ft. south of north right of way fence, about 120 ft. north of centre of track, on plate on concrete pillar.....	1572.482
69.66	Naisberry station, base of rail.....	1576.30
76.44	P.B.M.—G 22. Star City. About 220 yds. west of station building, 3 ft. north of south right of way fence, and about 120 ft. south of centre of track, on plate on concrete pillar.....	1538.216

PRINCE ALBERT TO HUDSON BAY JUNCTION.

Precise Level Line G.

ALONG Canadian Northern Railway.

MAPS 269, 270

Distance from Prince Albert Post Office.	Locality and Description.	Elevation.
Miles.		Feet.
76.55	Star City station, base of rail.....	1539.33
81.25	P.B.M.—G 23. Water tank, 4.7 miles east of Star City, on bolt leaded horizontally into concrete foundation, west corner of south face.....	1537.307
83.21	P.B.M.—G. 24. Valparaiso. About 140 yds. west of waiting room, 2 ft. north of south right of way fence, on plate on top of concrete pillar.....	1515.493
83.30	Valparaiso station, base of rail.....	1514.80
88.86	Tisdale station, base of rail .....	1477.04
88.93	P.B.M.—G 25. Tisdale. About 120 yds. east of station building, 4 ft. north of south right of way fence, and about 180 ft. south of centre of track, on plate on concrete pillar.....	1484.929
98.47	P.B.M.—G 27. Osgood. About 350 yds. west of station building, 48 ft. north of centre of track, on plate on concrete pillar.....	1489.744
98.68	Osgood station, base of rail .....	1495.42
100.45	Murphy station, base of rail .....	1503.87
102.41	Crooked River station, base of rail .....	1494.00
102.44	P. B. M.—G 28. Crooked River water tank. East end of south face, on top of spike in top of foundation beam, marked + .....	1492.035
102.93	P B M.—G 29. Crooked River. About 900 yards east of station building, and 46 ft. south of centre of track, on plate on concrete pillar .....	1505.702
110.25	Peesane station, base of rail.....	1606.74
110.54	P.B.M.—G 30. Peesane. About 525 yds. east of station building, and 48 ft. north of centre of track, on plate on concrete pillar.....	1606.875
118.00	P. B. M.—G 31. About 3½ miles west of Mistatim new station, about 180 ft. west of mileboard 243, 48 feet south of centre of track, on plate on concrete pillar..	1579.395

## PRINCE ALBERT TO HUDSON BAY JUNCTION.

*Precise Level Line G.*

## ALONG Canadian Northern Railway.

MAP 270

Distance from Prince Albert Post Office.	Locality and Description.	Elevation.
Miles.		Feet.
120.24	Old Mistatim station, base of rail. . . . .	1586.29
120.83	P. B. M.—G 32. New Mistatim. About ½ mile west of station building, 13 yds. east of 6th telegraph pole west of mileboard 240, on plate on concrete pillar. . . . .	1589.170
121.37	New Mistatim station, base of rail . . . . .	1595.82
125.18	P. B. M.—G 33. About 3¾ miles east of new Mistatim station, 18 yds. east of 4th telegraph pole east of mileboard 236, 48 ft. north of centre of track, on plate on concrete pillar . . . . .	1645.671
126.80	P. B. M.—G 33A. Water tank, about 5½ miles east of new Mistatim station, on nail in northeast face of woodwork, 2 ft. 6 ins. from corner and about 10 ins. above ground. . . . .	1628.780
128.80	P. B. M.—G 34. Bannock. About 500 yds. west of section house, 6 yds. west of 7th telegraph pole west of mileboard 232, on plate on concrete pillar. . . . .	1599.054
129.14	Bannock station, base of rail. . . . .	1597.60
135.76	Shaws station, base of rail. . . . .	1532.51
136.08	P. B. M.—G 35. Prairie river, about 500 yds. east of Shaws station, 115 yards east of mileboard 225, 48 ft. south of centre of track, on plate on concrete pillar. . . . .	1541.068
136.51	Prairie River station, base of rail. . . . .	1546.81
140.04	P. B. M.—G 36. About 3½ miles east of Prairie River station, 2 yds. east of mileboard 221, 48 ft. north of centre of track, on plate on concrete pillar. . . . .	1552.219
148.07	Greenbush station, base of rail. . . . .	1410.72
148.39	P. B. M.—G 37. Greenbush. About 560 yds. east of station building, 48 ft. north of centre of track, on plate on concrete pillar . . . . .	1418.512

PRINCE ALBERT TO HUDSON BAY JUNCTION.

*Precise Level Line G.*

ALONG Canadian Northern Railway.

MAP 270

Distance from Prince Albert Post Office.	Locality and Description.	Elevation.
Miles.		Feet.
151.55	P.B.M.—G 38. About 3½ miles east of Greenbush station, and about 360 yds. west of bridge number 209.2, on top of large white flint rock, 17 ft. south of centre of track, marked "B. Λ M".....	1396.684
156.03	P.B.M.—G 39. About 5.6 miles west of Hudson Bay Junction station, and about 150 yds. west of mile-board 205, 48 ft. south of centre of track, on plate on concrete pillar.....	1296.227
160.54	P.B.M.—G 39A. Hudson Bay Junction. About one mile west of station, 52 ft. west and 6 ft. north of 4th telegraph pole west of signboard "Hudson Bay Junction, Water," on plate on concrete pillar.....	1234.015
161.19	P.B.M.—G 40. Hudson Bay Junction. About 900 yds. west of station building, 48 ft. south of centre of track, and opposite to the 4th telegraph pole east of mileboard 200, on plate on concrete pillar (Damaged)	1226.890
161.51	Hudson Bay Junction, on switch point, Pas branch....	1223.30
161.62	P.B.M.—G 42. Hudson Bay Junction, water tank, on top of plate set in concrete foundation at south corner of structure.....	1225.164
161.70	Hudson Bay Junction station, base of rail.....	1219.13
162.25	P.B.M.—G 41. Hudson Bay Junction. On Pas branch, about ¾ mile north of Junction with Prince Albert-Dauphin line, 48 ft. west of centre of track, on high bank, on plate on concrete pillar.....	1231.747

## CALGARY TO EDMONTON.

*Precise Level Line H.*

## ALONG Canadian Pacific Railway.

MAP 114

Distance from Calgary Station.	Locality and Description.	Elevation.
Miles.		Feet.
	<i>Bench Marks, City of Calgary.</i>	
0.00	P.B.M.—H 1. Canadian Pacific Railway, Centre Street station, main entrance to waiting room, track side, on top of southeast corner of door sill.....	3438.916
0.20	P.B.M.—H 2. On MacDougall block, in south wall, in lane, 7 ft. west of west side of First Street East, 15 inches above ground, on copper plug set horizontally in wall.....	3437.011
0.21	Irrigation—B.M. Old Post Office building, in west wall, on brass bracket near northwest corner. (This B.M. subsequently destroyed owing to building being taken down. Inserted here for comparison).....	3436.331
0.46	P.B.M.—H 3. City Hall, on top of small wall at north east corner of building, on top of brass plate.....	3429.777
0.91	P.B.M.—H 4. Langevin Bridge, Fourth Street East, on top of northeast corner of wing wall, at north end of bridge, on top of brass plate.....	3428.988
0.92	City B.M. Langevin Bridge, Fourth Street East, on top of north end of east wing wall, at north end of bridge.	3428.960
2.80	P.B.M.—H 5. Calgary and Edmonton Ry. bridge over Bow river, on top of southerly pier, west side of track, marked $\Delta$ .....	3405.865
2.95	P.B.M.—H 6. Calgary and Edmonton Ry. bridge over Bow river, on top of northerly pier, east side of track, on top of brass plate.....	3407.369
2.95	Bow river, water, May 28, 1913, 3395.50; base of rail..	3411.70
4.72	T.B.M. 4. On 5th telegraph pole north of mileboard 3.	3417.11
6.78	P.B.M.—H 7. About 3.7 miles south of Beddington. East side of track, opposite 3rd telegraph pole north of mileboard 5, on top of brass plate set in large boulder.....	3449.100

CALGARY TO EDMONTON.

*Precise Level Line H.*

ALONG Canadian Pacific Railway.

MAP 164

Distance from Calgary Station.	Locality and Description.	Elevation.
Miles.		Feet.
8.69	T.B.M. S. On 4th telegraph pole north of mileboard 7.	3457.47
9.09	Nose creek, water, 3451.70; base of rail.....	3462.93
10.47	Beddington station, base of rail.....	3477.70
10.72	T.B.M. 10. On 5th telegraph pole north of mileboard 9.....	3481.72
12.65	T.B.M. 12. On 3rd telegraph pole north of mileboard 11.....	3515.82
14.72	P.B.M.—H 9. About 0.7 mile south of Balzac. On top of north end of east wall of concrete culvert, on top of brass plate.....	3529.544
15.41	Balzac station, base of rail.....	3543.70
16.66	T.B.M. 16. On 3rd telegraph pole north of mileboard 15.....	3538.25
18.54	T.B.M. 18. On 1st telegraph pole south of mileboard 17.....	3551.45
20.62	Airdrie station, base of rail.....	3550.70
20.71	P.B.M.—H 10. Airdrie. Steel bridge over creek about 150 yds. north of station building, east end of south concrete abutment, on top of brass plate.....	3548.894
22.55	T.B.M. 21. On telegraph pole, mileboard 21.....	3574.38
23.62	P.B.M.—H 11. About 3 miles north of Airdrie. 200 yds. south of mileboard 22, on north end of east wall of concrete culvert, on top of brass plate.....	3559.194
25.55	T.B.M. 24. On rail rack near mileboard 24.....	3561.14
27.52	Nose creek, water, 3563.00; base of rail.....	3578.20
27.56	T.B.M. 26. On telegraph pole, mileboard 26.....	3578.79
29.56	T.B.M. 28. On rail rack near mileboard 28.....	3620.33
30.55	Crossfield station, base of rail.....	3633.60

## CALGARY TO EDMONTON.

*Precise Level Line H.*

## ALONG Canadian Pacific Railway.

MAP 164

Distance from Calgary Station.	Locality and Description.	Elevation.
Miles.		Feet.
30.68	P.B.M.—H 13. Crossfield. Bank of Commerce building, near south end of front foundation wall and about 1½ ft. above ground, on iron plug set horizontally in wall.....	3639.402
30.82	Summit, highest point between Calgary and Edmonton.	3637.61
31.09	Road crossing, east of sec. 35, tp. 28, rge. 1.....	3632.30
32.61	T.B.M. 31. On rail rack near mileboard 31.....	3557.41
33.57	P.B.M.—H 14. About 3 miles north of Crossfield. 60 yds. north of mileboard 32, on north end of east wall of concrete culvert, on top of brass plate.....	3507.751
35.53	T.B.M. 34.—On 1st telegraph pole south of mileboard 34.....	3442.56
36.42	Wessex station, base of rail.....	3445.70
37.49	T.B.M. 36. On 2nd telegraph pole south of mileboard 36.....	3428.00
38.33	Road crossing, east of sec. 33, tp. 29, rge. 1.....	3399.40
38.48	Carstairs creek, water, 3382.50; base of rail.....	3399.00
38.48	Local depression.....	3399.00
38.55	P.B.M.—H 15 About 1½ miles south of Carstairs. On steel bridge No. 36.8, at east end of top of southerly concrete abutment, on brass plate.....	3396.602
40.40	T.B.M. 39. On 5th telegraph pole south of mileboard 39.....	3456.20
40.85	Road crossing, north of sec. 8, tp. 30, rge. 1.....	3474.60
41.08	Carstairs station, base of rail.....	3476.10
41.35	P.B.M.—H 16. Carstairs. Merchants Bank building at north end of east foundation, about 1 ft. above ground, iron plug set horizontally in wall.....	3477.713

CALGARY TO EDMONTON.

*Precise Level Line II.*

ALONG Canadian Pacific Railway.

MAP 164

Distance from Calgary Station.	Locality and Description.	Elevation.
Miles.		Feet.
42.36	T.B.M. 41. On 7th telegraph pole south of mileboard 41.....	3504.98
43.12	Local summit.....	3523.10
44.49	T.B.M. 43. On 4th telegraph pole south of mileboard 43.....	3464.70
45.85	P.B.M.—H 17. About 4.8 miles north of Carstairs. 8 telegraph poles north of mileboard 44, on top of south end of easterly wall of concrete bridge, on brass plate.....	3434.052
47.89	Road crossing, north of sec. 7, tp. 31, rge 1.....	3413.05
47.96	T.B.M. 47. On 12 th telegraph pole north of mileboard 46.....	3412.21
48.08	Didsbury station, base of rail.....	3412.55
48.21	P.B.M.—H 18. Didsbury. Union Bank building. At north end of east foundation wall, about 1 ft. above ground, on iron plug set horizontally in wall.....	3413.777
50.93	T.B.M. 50. On 10th telegraph pole north of mileboard 49.....	3313.97
51.05	Rosebud river, water, 3303.10; base of rail.....	3312.10
52.84	Rosebud station, base of rail.....	3364.70
52.96	T.B.M. 52. On 10th telegraph pole north of mileboard 51.....	3366.26
55.12	T.B.M. 54 On 16th telegraph pole north of mileboard 53.....	3370.08
56.59	Road crossing, east of sec. 29, tp. 32, rge. 1.....	3415.10
57.12	T.B.M. 56. On 14th telegraph pole south of mileboard 56.....	3403.45
58.14	Olds station, base of rail.....	3414.20

## CALGARY TO EDMONTON.

*Precise Level Line H.*

## ALONG Canadian Northern Railway.

MAPS 214, 215

Distance from Calgary Station.	Locality and Description.	Elevation.
Miles.		Feet.
58.39	P.B.M.—H 20. Olds. Bank of Commerce building at northeast corner of foundation wall, about 1 ft. above ground, iron plug set horizontally in wall.....	3412.485
58.41	Road crossing, north of sec. 32, tp. 32, rge. 1.....	3408.50
60.46	T.B.M. 59. On 4th telegraph pole south of mile-board 59.....	3404.65
60.66	Road crossing, north of sec. 9, tp. 33, rge. 1.....	3396.30
62.44	T.B.M. 61. On 4th telegraph pole south of mile-board 61.....	3323.36
64.56	Netook station, base of rail.....	3300.20
64.65	T.B.M. 63. On 2nd telegraph pole north of mile-board 63.....	3300.42
67.15	P.B.M.—H 21. About 1 $\frac{3}{4}$ miles south of Bowden. 16 telegraph poles north of mileboard, 65 on top of south end of easterly wall of concrete bridge, on brass plate.....	3234.338
67.15	Water in creek at B.M.—H 21.....	3227.50
68.88	Bowden station, base of rail.....	3244.90
69.01	P.B.M.—H 22. Bowden School building, at west end of north foundation wall, about 1 ft. above ground, on iron plug set horizontally in wall.....	3282.606
69.42	Road crossing, north of sec. 23, tp. 34, rge 1.....	3240.10
70.78	Road crossing, east of sec. 25, tp. 34, rge 1.....	3192.10
71.57	T.B.M. 70. On 1st telegraph pole south of mile-board 70.....	3149.94
73.49	T.B.M. 72. On 3rd telegraph pole south of mileboard 72.	3081.85
73.54	P.B.M.—H 23. About 4 $\frac{1}{2}$ miles north of Bowden, 5 telegraph poles south of mileboard, 72 on top of south end of easterly wall of concrete bridge, top of copper plug.....	3076.671

LEVELLING OPERATIONS

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CALGARY TO EDMONTON.

*Precise Level Line H.*

ALONG Canadian Pacific Railway.

MAP 215

Distance from Calgary Station.	Locality and Description.	Elevation.
Miles.		Feet.
75.17	Bridge 73.5, water, 3025.80; base of rail.....	3047.00
75.48	T.B.M. 74. On 3rd telegraph pole south of mileboard 74.....	3055.99
76.73	Innisfail station, base of rail.....	3100.10
76.99	P.B.M.—H 24. Innisfail. Bank of Commeree building, Pine street, at south west corner of foundation wall, about 1 ft. above ground, on copper plug set horizontally in wall.....	3107.583
77.94	Waskasu creek, water.....	3034.10
78.67	T.B.M. 77. On 2nd telegraph pole north of mile board 77.....	3022.30
80.70	T.B.M. 79. On 3rd telegraph pole north of mileboard 79.....	3026.43
82.83	T.B.M. 81. On 7th telegraph pole north of mileboard 81.....	2945.92
83.20	Waskasu creek, water, 2936.90; base of rail.....	2938.70
84.68	T.B.M. 83. On 3rd telegraph pole north of mileboard 83.....	2953.70
85.43	Penhold station, base of rail.....	2956.60
85.62	P.B.M.—H 26. Penhold. Section foreman's house, at south end of west foundation wall, about 1 ft. above ground, copper plug set horizontally in wall.....	2954.399
87.67	T.B.M. 86. On 2nd telegraph pole north of mileboard 86.....	2934.68
89.76	P.B.M.—H 27. About 1 mile south of Tuttle. 2 telegraph poles north of mileboard 88, at north end of westerly concrete wall of steel bridge on brass plate.....	2924.168
89.76	Waskasu creek, water.....	2918.20
90.49	Waskasu creek, water, 2913.40; base of rail.....	2920.10
90.75	Tuttle station, base of rail.....	2918.50
91.71	T.B.M. 90. On nut on east side of bridge over Waskasu creek, near mileboard 90.....	2912.38

## CALGARY TO EDMONTON.

*Precise Level Line II.*

## ALONG Canadian Pacific Railway.

MAP 215

Distance from Calgary Station.	Locality and Description.	Elevation.
		Feet.
Miles.		
91.71	Waskasu creek, water.....	2893.30
93.59	Waskasu creek, water, 2859.30; base of rail.....	2868.90
93.60	Switch point, Rocky Mountain House branch.....	2868.40
93.70	T.B.M. 92. On nut on west side of bridge over Waskasu creek, near mileboard 92.....	2864.62
93.70	Waskasu creek, water.....	2852.40
94.11	Waskasu creek, water, 2841.40; base of rail.....	2854.10
95.19	Red Deer station, base of rail.....	2819.10
95.64	Local depression, base of rail.....	2813.00
95.67	P.B.M.—H 28. Red Deer. Court House building, at north end of west foundation wall, about 2 feet above ground, on copper plug set horizontally in building..	2819.597
95.72	P.B.M.—H 29. Red Deer. About ½ mile north of rail- way station, at east end of most southerly pier of steel bridge over Red Deer river, on brass plate.....	2805.379
95.72	Red Deer river, water, July 12th, 1913, 2788.20; base of rail.....	2812.51
97.64	T.B.M. 97. On 14th telegraph pole north of mileboard 2.	2894.72
98.18	Labuma station, base of rail.....	2896.50
99.54	Road crossing, east of sec. 32, tp. 38, rge. 27, local summit.....	2908.30
99.88	T.B.M. 99. On 11th telegraph pole south of mileboard 5.	2896.43
101.42	P.B.M.—H 30. About ¾ miles north of Labuma. 6 telegraph poles north of mileboard 6, at north end of easterly wall of concrete bridge, on brass plate.....	2881.229
103.16	T.B.M. 102. On 2nd telegraph pole south of mileboard 8	2843.93
104.46	Road crossing, Calgary-Edmonton trail, sec. 16, tp. 39, rge. 27.....	2788.40

LEVELLING OPERATIONS

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CALGARY TO EDMONTON.

*Precise Level Line II.*

ALONG Canadian Pacific Railway.

MAP 215

Distance from Calgary Station.	Locality and Description.	Elevation.
Miles.		Feet.
104.53	P.B.M.—H 31. About 6¼ miles north of Labuma. At west end of southerly concrete abutment of steel bridge No. 9.3 over Blindman river, on brass plate...	2783.284
104.55	Blindman river, water, 2767.90; base of rail, local depression.....	2788.30
105.96	T.B.M 105. On 8th telegraph pole south of mileboard 11.....	2857.30
106.55	Road crossing, north of sec. 22, tp. 39, rge. 27.....	2883.20
107.00	Local summit.....	2887.10
107.35	P.B.M.—H 32. Blackfalds. School building, about middle of south foundation wall, 9 inches above ground, on copper plug set horizontally in wall.....	2886.948
109.01	T.B.M. 108. On 7th telegraph pole south of mileboard 14.....	2875.17
111.08	T.B.M. 110. On 5th telegraph pole south of mileboard 16.....	2809.53
112.01	Road crossing, Calgary-Edmonton trail, sec. 13, tp. 40, rge. 27.....	2802.70
113.08	T.B.M. 112. On base of most southerly switch stand, Lacombe.....	2798.04
113.51	Lacombe station, base of rail.....	2796.10
113.71	Switch point, Coronation branch line.....	2795.40
113.82	P.B.M.—H 34. Lacombe. Railway street, Day block, about 33 ft. south from property line of Burns Street, 1 ft. above sidewalk, on copper plug set horizontally in wall.....	2798.043
115.05	T.B.M. 114. On 5th telegraph pole south of mileboard 20.....	2774.39
116.37	Bridge, water, 2761.20; base of rail.....	2771.60

## CALGARY TO EDMONTON.

*Precise Level Line H.*

## ALONG Canadian Pacific Railway.

MAP 265

Distance from Calgary Station.	Locality and Description.	Elevation.
Miles.		Feet.
117.05	P. B. M.—H 35. About 3½ miles north of Lacombe. 7 telegraph poles north of mileboard 22, on top of north end of easterly wall of concrete bridge, on brass plate.....	2764.649
117.87	Lochinvar station, base of rail.....	2773.00
119.01	T. B. M. 118. On 7th telegraph pole south of mileboard 24.....	2777.10
121.00	T. B. M. 120. On 7th telegraph pole south of mileboard 26.....	2771.13
122.81	Morningside station, base of rail.....	2810.80
123.15	P. B. M.—H 36. Morningside. Section foreman's house at north end of east foundation wall, about 1½ feet above ground, on copper plug set horizontally in wall..	2812.279
125.25	T. B. M. 124. On rail rack near telegraph pole, mileboard 30.....	2712.39
127.24	T. B. M. 126. On telegraph pole, mileboard 32.....	2675.86
127.50	Road crossing, Calgary-Edmonton trail, sec. 30, tp. 42, rge. 25.....	2669.20
128.45	P. B. M.—H 37. About 1½ miles south of Ponoka, 6 telegraph poles south of mileboard 33, at east end of northerly concrete abutment of bridge, on brass plate.....	2649.460
129.08	Battle river, water, 2627.60, 22nd July, 1914; base of rail.....	2642.60
130.13	Ponoka station, base of rail.....	2646.70
130.30	P. B. M.—H 38. Ponoka. Bank of Commerce building, at south end of east foundation wall, about 3 inches above ground, on copper plug set horizontally in wall.....	2650.154
131.90	Road crossing, east of sec. 16, tp. 43, rge. 25.....	2654.50
132.20	T. B. M. 131. On rail rack near mileboard 37.....	2649.75



Photo by L. O. R. Dozers, D.L.S.  
P.B.M.—Q 32 C on house owned by George Wilkinson, Huddellston, Manitoba.



Photo by L. O. R. Dozers, D.L.S.  
P.B.M.—Q 35 on barn owned by Charles Lamont, Yonill, Manitoba.

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LEVELLING OPERATIONS

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CALGARY TO EDMONTON.

*Precise Level Line H.*

ALONG Canadian Pacific Railway.

MAP 265

Distance from Calgary Station.	Locality and Description.	Elevation.
Miles.		Feet.
134.20	T. B. M. 133. On 1st telegraph pole south of mileboard 39.....	2632.33
135.45	Menaik station, base of rail.....	2616.90
136.48	P. B. M.—H 39. Indian Reserve. 1 mile north of Menaik, 10 poles south of mileboard 41, at north end of west wall of concrete bridge, on brass plate.....	2620.617
138.21	T. B. M. 137. On 1st telegraph pole south of mileboard 43.....	2646.77
140.23	T. B. M. 139. On telegraph pole, mileboard 45.....	2669.43
141.74	Road crossing, Calgary-Edmonton trail, Indian Reserve	2630.90
141.90	Hobbema station, base of rail.....	2626.20
142.47	P. B. M.—H 40. Hobbema. Indian Reserve, Government Stores building, at west end of north foundation wall, about 4 inches above ground, on iron plug set horizontally in wall.....	2623.147
144.19	T. B. M. 143. On 1st telegraph pole south of mileboard 49.....	2559.72
146.20	T. B. M. 145. On 1st telegraph pole south of mileboard 51.....	2520.25
146.76	Navarre station, base of rail.....	2517.60
148.20	T. B. M. 147. On 1st telegraph pole south of mileboard 53.....	2506.94
150.22	T. B. M. 149. On telegraph pole, mileboard 55.....	2504.18
152.26	Wetaskiwin station, base of rail.....	2493.00
152.49	Switch point, Hardisty branch.....	2493.30
152.34	P. B. M.—H 42. Wetaskiwin. Merchants Bank building, Pearee street, at west end of foundation wall, 1 ft. above ground, on copper plug set horizontally in wall.	2497.713

## TOPOGRAPHICAL SURVEYS BRANCH

## CALGARY TO EDMONTON.

*Precise Level Line H.*

## ALONG Canadian Pacific Railway.

MAP 265

Distance from Calgary Station.	Locality and Description.	Elevation.
Miles.		Feet.
152.34	Wetaskiwin City B.M. Merchants Bank building, Pearee street, at southwest corner of foundation wall, about 3 inches above ground, on head of nail.....	2497.320
154.23	T.B.M. 153. On 1st telegraph pole north of mileboard 59	2494.88
154.23	Road crossing, Calgary-Edmonton trail, sec. 27, tp. 46, rge. 24.....	2498.40
156.18	T.B.M. 155. On 1st telegraph pole south of mileboard 61.....	2488.83
157.19	Bigstone station, base of rail.....	2491.40
157.75	Bigstone creek, water, 2464.70; base of rail.....	2485.51
158.18	T.B.M. 157. On 1st telegraph pole south of mileboard 63.....	2485.00
160.90	Pipestone creek, water, 2425.40; base of rail.....	2448.10
161.43	P.B.M.—H 44. About ½ mile south of Millet. 11 telegraph poles north of mileboard 66, at east end of southerly concrete abutment of bridge over Pipestone creek, on brass plate.....	2448.029
162.02	Millet station, base of rail.....	2473.30
163.17	T.B.M. 162. On 1st telegraph pole south of mileboard 68.....	2479.19
165.22	T.B.M. 164. On telegraph pole, mileboard 70.....	2479.13
167.23	T.B.M. 166. On 1st telegraph pole north of mileboard 72.....	2506.59
167.41	Road crossing, Calgary-Edmonton trail, sec. 30, tp. 48, rge. 24.....	2506.00
168.22	Kavanagh station, base of trail.....	2499.70
169.37	P.B.M.—H 45. Kavanagh. About 1 mile north of station, in house belonging to Rudolph Redmond, at west end of north foundation wall, on copper plug set horizontally in wall.....	2492.917

CALGARY TO EDMONTON.

*Precise Level Line II.*

ALONG Canadian Pacific Railway.

MAP 315

Distance from Calgary Station.	Locuity and Description.	Elevation.
Miles.		Feet.
171.37	T.B.M. 170. On 5th telegraph pole north of mileboard 76	2443.99
173.37	T.B.M. 172. On 4th telegraph pole north of mileboard 78	2409.33
173.37	Road crossing, north of sec. 23, tp. 49, rge. 25.	2416.40
174.63	P.B.M.—H 46. Leduc. Anderson Block (Star store), at southwest corner of foundation wall, about 1 foot above ground, on copper plug set horizontally in wall.	2395.433
174.63	Leduc station, base of rail. . . . .	2394.30
176.26	T.B.M. 175. On 1st telegraph pole north of mileboard 81	2378.46
177.27	Road crossing, north of sec. 11, tp. 50, rge. 24. . . . .	2367.20
178.26	T.B.M. 177. On 2nd telegraph pole north of mileboard 83	2348.54
179.27	Nisku station, base of rail. . . . .	2344.90
180.34	T.B.M. 179. On 4th telegraph pole north of mileboard 85	2330.18
180.34	Road crossing, east of sec. 26, tp. 50, rge. 24. . . . .	2323.10
182.40	P.B.M.—H 47. About 3 miles north of Nisku. 6 telegraph poles north of mileboard 87, at west end of southerly concrete abutment of bridge over Blackmud creek, on brass plate. . . . .	2268.793
182.41	Blackmud creek, water, 2257.80; base of rail. . . . .	2272.70
183.87	Road crossing, Calgary-Edmonton trail, sec. 17, tp. 51 rge. 24. . . . .	2282.30
184.19	T.B.M. 183. On rail rack near mileboard 89. . . . .	2281.13
185.84	Ellerslie station, base of rail. . . . .	2255.70
186.27	T.B.M. 185. On 2nd telegraph pole north of mileboard 91. . . . .	2248.86
188.35	P.B.M.—H 48. South Edmonton. 5 poles north of mileboard 93, at east end of northerly abutment of bridge, on copper plug. . . . .	2220.482

73075—21½

## TOPOGRAPHICAL SURVEYS BRANCH

## CALGARY TO EDMONTON.

*Precise Level Line H.*

## ALONG Canadian Pacific Railway.

MAP 315

Distance from Calgary Station.	Locality and Description.	Elevation.
		Feet.
Miles.		
190.24	T.B.M. 189. On 1st telegraph pole north of mileboard 95	2208.15
191.26	South Edmonton City B.M. No. 7. On spike on 2nd telegraph pole north of mileboard 96 (City elevation 254.64).....	2211.496
192.16	Strathcona station, base of rail.....	2204.30
192.15	Strathcona station, south end of door sill, waiting room, track side.....	2206.10
192.47	Road crossing, Main street.....	2201.40
193.27	P.B.M.—H 49. High level railway bridge over Saskatchewan river, south abutment, west side of trestle work, about 4 ft. below level of rail, on copper plug set horizontally in wall.....	2176.276
193.61	P.B.M.—H 50. High level railway bridge, on top of northeast corner of most easterly of the four concrete pedestals nearest south bank of Saskatchewan river, on brass plate, marked "T.S. B.M.".....	2052.151
193.61	P.W.D. B.M. No. 0. High level railway bridge, on top of northeast corner of most easterly of the four concrete pedestals nearest S. bank of Saskatchewan river. (This point is about 6 inches from B.M. H 50, and has same elevation).....	2052.151
193.67	Canadian Pacific railway, base of rail on high level bridge.....	2171.910
193.67	North Saskatchewan river, water, August 18, 1913.	2018.60
193.76	P.B.M.—H 51. High level railway bridge, on top of east end of northerly abutment, on brass plate, marked "T.S. B.M.".....	2172.122
194.34	B.M. Edmonton Canadian Pacific railway station, southwest corner of door sill, main entrance to waiting room, track side.....	2183.70
194.34	Edmonton. Canadian Pacific railway station, base of rail	2182.50
195.19	Edmonton, Canadian Northern railway station, base of rail.....	2185.10

HUDSON BAY JUNCTION TO PAS.

*Precise Level Line J.*

Along Canadian Northern Railway.

MAP 270

Distance from H. B. Jet. Station.	Locality and Description.	Elevation.
Miles.		Feet.
0.00	Hudson Bay Junction, station, base of rail .....	1219.13
0.12	P.B.M.—G 42. Hudson Bay Junction. Water tank, near west wye, on top of plate set in top of concrete foundation at south corner of structure.....	1225.164
	Hudson Bay Junction, switch point, west wye, Pas branch.....	1223.30
0.75	P.B.M.—G 41. About $\frac{3}{4}$ mile north of Junction with Prince Albert and Dauphin line, on high bank, 48 feet west of centre of track, on plate on concrete pillar.....	1231.747
2.60	Bridge No. 2.6, water, 1221.5; base of rail.....	1233.62
2.97	T.B.M. 3. On 2nd telegraph pole south of mileboard 3.	1233.45
3.40	Bridge No. 3.4, water 1223.4; base of rail.....	1235.40
5.02	T.B.M. 5. On telegraph pole mileboard 5.....	1234.14
6.00	Bridge No. 6.0, water 1230.2; base of rail .....	1237.60
6.24	P.B.M.—J 1. About $2\frac{3}{4}$ miles south of Wachee station, $\frac{1}{4}$ mile south of middle of Ruby Lake Siding, $6\frac{1}{2}$ telegraph poles north of mileboard 6, and 48 ft. west of centre of track, on plate on concrete pillar .....	1240.719
6.36	Ruby Lake station, base of rail.....	1240.00
7.03	T.B.M. 7. On telegraph pole, mileboard 7.....	1243.49
8.76	P.B.M.—J 2. Opposite to south switch at Wachee station, 1330 ft. south of mileboard 9, and 50 ft. west of centre of track, on plate on concrete pillar.....	1245.482
8.82	Wachee station, base of rail.....	1248.40
10.95	T.B.M. 11. On 2nd telegraph pole south of mileboard 11.....	1219.87
12.60	Nepas station, base of rail.....	1207.50
12.70	Bridge No. 12.7, water 1198.7; base of rail.....	1208.48

## TOPOGRAPHICAL SURVEYS BRANCH

## HUDSON BAY JUNCTION TO PAS.

Precise Level Line J.

## Along Canadian Northern Railway.

MAPS 270, 320

Distance from H. B. Jet. Station.	Locality and Description.	Elevation.
Miles.		Feet.
12.97	T.B.M. 13. On telegraph pole mileboard 13.....	1203.45
14.99	T.B.M. 15. On 1st telegraph pole south of mileboard 15.	1202.27
17.01	T.B.M. 17. On telegraph pole mileboard 17.....	1181.76
17.72	P.B.M.—J 3. Ceba. About $\frac{1}{4}$ mile south of siding, 525 ft. south of mileboard 18, and 48 ft. east of centre of track, on plate on concrete pillar.....	1181.494
17.97	Ceba station, base of rail.....	1171.41
20.00	T.B.M. 20. On telegraph pole mileboard 20.....	1142.00
20.24	Overflowing river (branch), bridge 20.3, water.....	1135.9
22.00	T.B.M. 22. On telegraph pole mileboard 22.....	1122.71
24.01	T.B.M. 24. On telegraph pole mileboard 24.....	1129.50
25.80	P.B.M. J 3A. About $1\frac{1}{2}$ miles south of Chemong siding, 90 ft. south of bridge No. 25.9 and 35 ft. west of centre of track, on plate on concrete pillar.....	1130.748
26.35	P.B.M.—J 4. (Destroyed.)	
26.36	Pasquia river (branch), water, 1119.6; base of rail.....	1130.42
27.05	B.M. No. 9, (13th base) On 13th base line. 1,232 ft. west of railway, 350 ft. west of $\frac{1}{4}$ post, on north of section 32, tp. 48, rge. 1, west of the second meridian, on nail (about 2 ft. above ground) in tamarack tree, on south side of line blazed and marked "B.M. IX".....	1142.955
27.30	Chemong station, base of rail.....	1133.70
28.40	Pasquia river (another branch), water, 1113.9, base of rail.....	1125.08
28.98	T.B.M. 29. On telegraph pole mileboard 29.....	1124.93
29.33	Pasquia river (another branch), water, 1121.2, base of rail.....	1126.65

HUDSON BAY JUNCTION TO PAS.

*Precise Level Line J.*

Along Canadian Northern Railway.

MAPS 320, 321

Distance from H. B. Jct. Station.	Locality and Description.	Elevation.
Miles.		Feet.
30.86	Bridge No. 30.9, water, 1110.0. Base of rail.....	1118.72
31.05	P.B.M. J 5. About 4 miles north of Chemong, 35 ft. north of 2nd telegraph pole north of mileboard 31, and 48 ft. west of centre of track, on plate on concrete pillar.....	1116.456
32.47	Bridge 32.5, water, 1081.4; base of rail.....	1089.59
32.96	T.B.M. 33. On 1st telegraph pole south of mileboard 33.....	1086.71
33.98	Bridge 34.1, water, 1089.9; base of rail.....	1096.19
34.94	T.B.M. 35. On 1st telegraph pole south of mileboard 35.....	1082.73
35.10	Otosquen, station, base of rail.....	1082.50
36.95	T.B.M. 37. On 1st telegraph pole south of mileboard 37.....	1042.86
38.95	T.B.M. 39. On 1st telegraph pole south of mileboard 39.....	1023.08
40.51	P.B.M. J 5 A. About 2½ miles south of Cantyre, near 20th telegraph pole, north of mileboard 40, and 50 ft. west of centre of track, on plate on concrete pillar.....	1019.662
42.95	T.B.M. 43. On telegraph pole mileboard 43.....	1008.92
43.00	Cantyre station, base of rail.....	1009.46
44.98	T.B.M. 45. On telegraph pole mileboard 45.....	976.48
46.99	T.B.M. 47. On spike in side of top stringer (near its north end), on west side of bridge between second and third telegraph poles, north of mileboard 47....	965.42
48.97	T B.M. 49. On telegraph pole mileboard 49.....	960.21
50.4	Turnberry station, base of rail.....	951.81
50.86	Pasquia river (main stream) water 928.1; base of rail.	947.72

## TOPOGRAPHICAL SURVEYS BRANCH

## HUDSON BAY JUNCTION TO PAS.

Precise Level Line J.

## Along Canadian Northern Railway.

MAP 321

Distance from H. B. Jct. Station.	Locality and Description.	Elevation.
Miles.		Feet.
50.86	P.B.M.—J 6. Turnberry. About $\frac{1}{2}$ mile north of station, 35 ft. north of south end of bridge, 50.9; and 49 ft. west of centre of track, on plate on concrete pillar	941.764
52.98	T.B.M. 53. On 1st telegraph pole north of mile-board 53.....	959.97
54.97	T.B.M. 55. On 2nd telegraph pole north of mile-board 55.....	928.73
56.97	T.B.M. 57. On 1st telegraph pole north of mile-board 57.....	908.62
57.72	Bridge 57.8, water 900.6; base of rail.....	904.91
57.76	P.B.M. —J 6A. About $2\frac{1}{2}$ miles south of Whithorn, 6 ft. north of 1st telegraph pole north of bridge 57.8 and 50 ft. east of centre of track, on copper bolt in concrete pillar.....	910.299
57.79	Bridge 58.0, water 908.2; base of rail.....	912.99
58.90	T.B.M. 59. On telegraph pole, mileboard 59.....	924.79
60.30	Whithorn station, base of rail.....	933.00
61.03	T.B.M. 61. On telegraph pole, mileboard 61.....	927.65
62.97	T.B.M. 63. On 2nd telegraph pole north of mileboard 63	918.48
64.48	Bridge 64.7. water, 900.1; base of rail.....	905.92
64.95	P.B.M.—J 7. About 3 miles south of Westray, $1\frac{1}{2}$ telegraph poles south of mileboard 65, and 48 ft. east of centre of track, on plate on concrete pillar.....	924.445
65.94	Bridge 66.2. water, 902.7; base of rail.....	910.82
66.66	T.B.M. 67. On 1st telegraph pole south of mileboard 67	903.12
67.65	Bridge No. 67.8. water, 898.3; base of rail.....	904.07
67.69	P.B.M.—J 8. About $\frac{1}{2}$ mile south of Westray, 200 ft. south of south end of bridge No. 67.9, and 48 ft. west of centre of track, on plate on concrete pillar.....	904.177

HUDSON BAY JUNCTION TO PAS.

*Precise Level Line J.*

Along Canadian Northern Railway.

MAP 321

Distance from H. B. Jct. Station.	Locality and Description.	Elevation.
Miles.		Feet.
68.23	Westray station, base of rail.....	910.74
69.46	T. B. M. 70. On telegraph pole, mileboard 70.....	898.26
69.84	Bridge 70.3, water 885.9; base of rail.....	898.29
71.33	T. B. M. 72. On telegraph pole, mileboard 72.....	902.55
73.20	T. B. M. 74. On " " 74.....	902.31
75.08	T. B. M. 76. On " " 76.....	907.73
77.20	P. B. M.—J 9. Freshford. About ½ mile south of Freshford, at the 9th telegraph pole north of mileboard 77, and about 46 ft. east of centre of track, on plate on concrete pillar.....	911.903
77.8	Freshford station, base of rail.....	904.00
80.72	T. B. M. 82. On telegraph pole, mileboard 82.....	880.65
82.54	T. B. M. 84. On 2nd telegraph pole south of mileboard 84.....	886.22
84.44	T. B. M. 86. On 1st telegraph pole south of mileboard 86.....	895.70
86.40	Reclamation Service B. M. On a stump near 1st tele- graph pole north of the Yard limit at Pas, and 50 ft. west of centre of track.....	868.13
86.59	P. B. M.—J 10. About 1 mile south of Pas station (Canadian Northern railway), 350 ft. south of board marked "The Pas, One mile," at south end of curve, and about 48 feet west of track, on plate on concrete pillar.....	872.758
87.54	Pas station (Canadian Northern railway), base of rail..	880.75
88.47	P. B. M.—J 11. Pas, on railway bridge over Saskat- chewan river, on brass plate on west side of top of most southerly concrete pier, marked "T. S. B. M.".	880.606

## HUDSON BAY JUNCTION TO PAS.

*Precise Level Line J.*

Along Canadian Northern Railway.

MAP 321

Distance from H. B. Jet. Station.	Locality and Description.	Elevation.
Miles.		Feet.
88.47	Public Works Department B.M. No. 302. Pas. On railway bridge over Saskatchewan river, on copper plug set in west face of most southerly concrete pier, and about 4ft. from the ground, marked "P.W.D. B.M. 79" .....	865.635
88.65	P.B.M.—J 12. Pas. On railway bridge over Saskatchewan river, on brass plate set in west side of top of most northerly concrete pier, marked "T.S. B.M." .....	880.682
90.87	Hudson Bay Railway B.M. On Hudson Bay railway. On a stump at their chainage 351; 50 ft. west of centre line (elevation according to railway datum = 865.42).	891.96
91.84	Hudson Bay Railway B.M. On Hudson Bay railway. On a stump at their chainage 402; 50 ft. west of centre of line. (Elevation according to railway datum = 849.20) ..	875.90
93.67	B.M. No. 19 (15th Base). On 15th base line, 132 ft. west of N.E. cor. sec. 35, tp. 56, rge. 26, on notch on 8-inch spruce tree, 12 ft. south of line, marked "B.M. XIX" .....	863.47

## HUDSON BAY JUNCTION TO SWAN RIVER.

*Precise Level Line K.*

Along Canadian Northern Railway.

MAP 270

Distance from H. B. Jet. Station.	Locality and Description.	Elevation.
Miles.		Feet.
0.00	P.B.M.—G 42. Hudson Bay Junction. Water tank, on top of plate set in top of concrete foundation at south corner of structure.....	1225.164
0.12	Hudson Bay Junction, station, base of rail.....	1219.13
2.43	T.B.M. 3. On telegraph pole, mileboard 197.....	1173.12
4.38	T.B.M. 5. On 1st telegraph pole west of mileboard 195.....	1141.18
4.44	P.B.M.—K 1 A. About 4½ miles east of Hudson Bay Junction, 14 ft. east and 3 ft. north of 3rd telegraph pole west of mileboard 195, on plate on concrete pillar.	1143.001
6.39	T.B.M. 7. On 1st telegraph pole west of mileboard 193.....	1106.69
6.44	Red Deer river (branch), water, 1104.7; base of rail....	1108.67
8.25	Red Deer river, water, 1046.0; base of rail.....	1074.55
8.46	P.B.M.—K 1. Erwood. About 1,000 ft. west of station, 458 ft. east of east end of bridge over Red Deer river, 55 ft. west of mileboard 191, and 48 ft. north of centre of track, on plate on concrete pillar.....	1079.707
8.50	P.B.M.—K 2. Erwood. Facing station platform and 40 ft. south of centre of track, on bolt set in top of concrete pillar, 2 ft. square, and standing 2½ ft. above ground.....	1081.041
8.50	Erwood station, base of rail.....	1078.38
10.34	T.B.M. 11. On 2nd telegraph pole west of mileboard 189.....	1080.44
12.35	T.B.M. 13. On 1st telegraph pole west of mileboard 187.....	1074.11
14.35	P.B.M.—K 2 A. About 6 miles east of Erwood, 31 ft. east and 4 ft. north of 1st telegraph pole west of mileboard 185, on plate on concrete pillar.....	1099.121
14.95	Bridge 184.4, water, 1100.7; base of rail.....	1108.71
16.28	T.B.M. 17. On 2nd telegraph pole west of mileboard 183.....	1119.43



# MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



4.5

2.8

2.5

5.0

3.2

2.2

5.6

6.3

3.6

7.1

8.0

9.0

10.0

4.0

2.0



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## HUDSON BAY JUNCTION TO SWAN RIVER.

*Precise Level Line K.*

## Along Canadian Northern Railway.

MAP 271

Distance from H. B. Jet. Station.	Locality and Description.	Elevation.
Miles.		Feet.
18.31	T.B.M. 19. On 2nd telegraph pole west of mileboard 181.....	1110.99
21.03	Roscoe station, base of rail.....	1054.12
21.06	P.B.M.—K 3. Roscoe. 180 ft. east of signboard and 450 ft. west of switch east of station, 40 ft. south of track, on bolt in top of concrete pillar.....	1056.192
21.31	Smoking Tent river (branch), water, 1028.0; base of rail.....	1038.03
22.10	Smoking Tent river (branch), water, 1016.6; base of rail.....	1022.26
24.14	T.B.M. 25. On 3rd telegraph pole west of mileboard 175.....	1011.48
25.12	Smoking Tent river (branch), water, 1008.9; base of rail.....	1020.88
25.33	P.B.M.—K 3 A. About 4½ miles east of Roscoe, midway between mileboard 174 and 1st telegraph pole west, in alignment with telegraph poles, on plate on concrete pillar.....	1022.096
25.75	Bridge 174.5, over branch of Smoking Tent river.....	1017.09
26.18	T.B.M. 27. On 2nd telegraph pole west of mileboard 173.....	1013.83
28.19	T.B.M. 29. On 1st telegraph pole west of mileboard 171.....	1010.49
30.02	Armit river, water, 1002.8; base of rail.....	1014.43
30.54	P.B.M.—K 4. Westgate. 120 ft. west of 6th telegraph pole west of switch west of station, 35 ft. south of centre of track, on bolt in top of concrete pillar.....	1018.338
30.96	Westgate station, base of rail.....	1013.65
32.00	Armit river (branch), water, 1002.0; base of rail.....	1005.16
32.06	T.B.M. 33. On 4th telegraph pole west of mileboard 167.....	1003.81

HUDSON BAY JUNCTION TO SWAN RIVER.

Precise Level Line K.

ALONG Canadian Northern Railway.

MAP 271

Distance from H. B. Jct. Station.	Locality and Description.	Elevation.
Miles.		Feet.
32.84	Armit river (branch), water, 1001.3; base of rail.....	1008.81
34.34	T.B.M. 35. On 4th telegraph pole east of mileboard 165.....	1013.02
34.41	Armit river (branch), water, 999.8; base of rail.....	1010.52
35.21	P.B.M.—K 4 A. About 4½ miles east of Westgate, 48 ft. west of 1st telegraph pole east of mileboard 164, in alignment with telegraph poles, on plate on concrete pillar.....	992.066
36.18	T.B.M. 37. On telegraph pole at mileboard 163.....	999.49
36.46	Armit river (branch), water, 1003.0; base of rail.....	1010.05
37.19	T.B.M. 38. On telegraph pole at mileboard 162.....	1021.86
37.57	Armit river (branch), water, 1017.9; base of rail.....	1028.94
39.50	Armit river " " " 1019.0; " .....	1028.13
39.84	T.B.M. 40A. On 1st telegraph pole west of Barrows Jct.	1024.68
39.86	Barrows Junction station, base of rail. ....	1028.37
40.17	P.B.M.—K 5. Barrows Junction. 4 telegraph poles east of Junction, 90 ft. east of bridge No. 159.2, and 45 ft. south of centre of track, on bolt in top of concrete pillar.....	1031.297
(44.57)	P.B.M.—K 6. Barrows. In west face of stone part of Red Deer Lumber Company's office, 9 inches north of southwest corner, and 2 ft. above ground, on bolt set in wall.....	867.612
	Red Deer lake, 5 miles north of Barrows Junction.....	860.30
41.27	Bridge 158.0, water, 1017.7; base of rail.....	1030.64
41.63	Powell station, base of rail.....	1036.32
41.88	P.B.M.—K 7. Powell. 50 ft. south of east switch facing the switch, on bolt in top of concrete pillar..	1038.080

## HUDSON BAY JUNCTION TO SWAN RIVER.

*Precise Level Line K.*

Along Canadian Northern Railway.

MAP 271

Distance from H. B. Jet. Station.	Locality and Description.	Elevation.
Miles.		Feet.
43.03	T.B.M. 44. On 4th telegraph pole west of bridge 156.0	1053.59
43.16	Bridge, 156.0, water, 1039.0; base of rail.....	1051.66
45.65	Rice river (branch), water, 1049.9; base of rail.....	1067.79
46.14	T.B.M. 47. On 1st telegraph pole west of mileboard 153.....	1055.12
46.91	Rice river water, 1038.4; base of rail.....	1044.84
47.27	P.B.M.—K. 7A. About 5½ miles east of Powell, 11 ft. east and 6 ft. north of 3rd telegraph pole west of mileboard 152, on plate on concrete pillar.....	1049.526
48.77	Rice river (branch) water, 1036.1; base of rail.....	1042.55
49.18	T.B.M. 50. On 1st telegraph pole east of mileboard 150.....	1036.10
50.28	P.B.M.—K 8. Baden. 3 telegraph poles west of station, 240 ft. east of east end of bridge No. 148.9, and 48 ft. south of centre of track, on bolt in top of concrete pillar.....	1037.405
50.44	Baden station, base of rail.....	1038.39
51.10	Bridge 148.1, water, 1024.0; base of rail.....	1035.45
52.12	T.B.M. 53. On 1st telegraph pole north of mileboard 147.....	1034.20
54.16	T.B.M. 55. On 1st telegraph pole south of mileboard 145.....	1039.90
55.29	P.B.M.—K. 8A. About 4¾ miles south of Baden, midway between 2nd and 3rd telegraph poles north of mileboard 144 and 3 ft. east of alignment of telegraph poles, on plate on concrete pillar.....	1044.192
55.74	Steepprock river, water, 1028.5; base of rail.....	1039.21
56.18	T.B.M. 57. On 2nd telegraph pole south of mileboard 143.....	1043.41

HUDSON BAY JUNCTION TO SWAN RIVER.

Precise Level Line K.

Along Canadian Northern Railway.

MAP 271

Distance from H. B. Jet. Station.	Locality and Description.	Elevation.
Miles.		Feet.
57.19	T.B.M. 58. On 2nd telegraph pole south of mileboard 142.....	1050.95
57.63	Bell river (branch), water, 1053.2; base of rail.....	1058.88
58.22	Bell river (branch), water, 1059.7; base of rail.....	1064.76
58.62	Mafeking station, base of rail.....	1069.18
58.75	P.B.M.—K 9. Mafeking. Near 2nd telegraph pole south of station, 120 ft. north of north end of bridge 140.3, and 40 ft. east of centre of track, on bolt in top of concrete pillar.....	1068.617
59.71	P.B.M.—K. 9A. About 1 mile south of station, 29 ft. north of 3rd telegraph pole south of signboard "Mafeking One Mile" and between the 11th and 12th telegraph poles north of mileboard 139, in alignment with telegraph poles, on plate on concrete pillar.....	1069.255
60.08	T.B.M. 61. On telegraph pole at mileboard 139.....	1067.61
60.52	Bell river (branch), water, 1057.6; base of rail.....	1062.98
62.12	T.B.M. 63. On 1st telegraph pole south of mileboard 137.....	1063.93
62.72	Bell river (branch), water, 1053.0; base of rail.....	1057.69
64.04	T.B.M. 65. On 1st telegraph pole north of mileboard 135.....	1058.03
65.01	P.B.M.—K.9B. About 6½ miles south of Mafeking, 38 ft. north and 3 ft. east of mileboard 134, which is the 3rd telegraph pole south of bridge No. 134.0 over Bell river, on plate on concrete pillar.....	1073.502
65.03	Bell river, water, 1064.7; base of rail.....	1074.55
66.98	T.B.M. 68. On 2nd telegraph pole north of mileboard 132.....	1066.88
68.97	T.B.M. 70. On 2nd telegraph pole north of mileboard 130.....	1065.27

## TOPOGRAPHICAL SURVEYS BRANCH

## HUDSON BAY JUNCTION TO SWAN RIVER.

Precise Level Line K.

Along Canadian Northern Railway.

MAPS 271, 221

Distance from H. B. Jct. Station.	Locality and Description.	Elevation.
Miles.		Feet.
69 18	P.B.M.—K. 9C. About half a mile north of Novra station, 53 ft. east and 18 ft. north of signboard "Novra Water" and 18 ft. north and 3 ft. east of 8th telegraph pole north of mileboard 130, on plate on concrete pillar. . . . .	1064.790
69.71	P.R.M.—K 10. Novra. About 200 ft. south of water tank north of station, 120 ft. south of north switch, and 50 ft. west of centre of track, on bolt in top of concrete pillar. . . . .	1061.017
69.79	Novra station, base of rail. . . . .	1061.00
70.10	Gut creek, water, 1048.7; base of rail. . . . .	1061.23
71.08	T.B.M. 72. On 1st telegraph pole north of mileboard 128. . . . .	1062.38
74.12	Creek flowing to Woody river, water, 1068.8; base of rail. . . . .	1074.93
74.35	T.B.M. 75. On 2nd telegraph pole south of mileboard 125. . . . .	1064.97
74.52	P.B.M.—K. 10A. About 4¾ miles south of Novra, 42 ft. north of 3rd telegraph pole north of mileboard 125, and in alignment with telegraph poles, on plate on concrete pillar. . . . .	1071.897
76.24	Creek flowing to Woody river, water, 1041.5; base of rail. . . . .	1051.18
76.48	T.B.M. 77. On 2nd telegraph pole south of mileboard 123. . . . .	1048.29
76.78	Woody river (branch) water, 1034.0; base of rail. . . . .	1046.33
77.74	" " 1027.2; " . . . . .	1044.36
78.02	P.B.M.—K. 10B. About 1 mile north of Birch River station, 50 ft. north and 3 ft. east of 3rd telegraph pole north of signboard "Birch River One Mile" and between the 8th and 9th telegraph poles south of bridge No. 121.2, on plate on concrete pillar. . . . .	1040.254
78.49	T.B.M. 79. On 1st telegraph pole north of mileboard 121. . . . .	1041.19

HUDSON BAY JUNCTION TO SWAN RIVER.

Precise Level Line K.

Along Canadian Northern Railway.

MAP 221

Distance from H. B. Jet. Station.	Locality and Description.	Elevation.
Miles.		Feet.
78.60	Birch river (branch), water, 1031.8; base of rail .....	1043.59
79.22	Birch River station, base of rail .....	1040.69
79.28	P.B.M.—K 11. Birch River. 450 ft. south of centre of station, 49 ft. east of centre of track, on bolt in top of concrete pillar.....	1039.778
79.57	Birch river, water, 1020.6; base of rail.....	1033.07
80.97	T.B.M. 82. On 1st telegraph pole south of mileboard 118.	1031.23
81.04	Jaekfish creek (branch), water, 1026.5; base of rail....	1033.14
82.88	T.B.M. 84. On 2nd telegraph pole north of mileboard 116.....	1029.71
84.05	P.B.M.—K 11 A About 4 $\frac{3}{4}$ miles south of Birch River station, 40 ft. north and 6 ft. east of 3rd telegraph pole south of mileboard 115, on plate on concrete pillar	1029.813
85.83	T.B.M. 87. On 2nd telegraph pole north of mileboard 113.....	1012.65
85.93	Bridge 112.9, Kematch river water, 1011.6; base of rail .	1015.25
86.82.	T.B.M. 88. On 2nd telegraph pole north of mileboard 112.....	1005.45
87.50	Bridge 111.4, water, 994.8; base of rail.....	1004.75
88.84	T.B.M. 90. On 2nd telegraph pole north of mileboard 110.....	1001.54
90.09	Bridge north of Bowsman station, water, 989.1; base of rail.....	1007.18
90.80	Bowsman station, base of rail.....	1016.86
90.85	T.B.M. 92. On telegraph pole north of mileboard 108.	1013.77
90.94	P.B.M.—K 12. Bowsman. 810 ft. south of centre of station, 140 ft. west of centre of track, on bolt in top of concrete pillar.....	1015.148

TOPOGRAPHICAL SURVEYS BRANCH  
HUDSON BAY JUNCTION TO SWAN RIVER.

*Precise Level Line K.*

Along Canadian Northern Railway.

MAP 221

Distance from H. B. Jct. Station.	Locality and Description.	Elevation.
Miles.		Feet.
91.88	Woody river (branch), water, 999.4; base of rail.....	1028.49
92.86	T.B.M. 94. On 1st telegraph pole north of mileboard 106.	1029.27
94.86	P.B.M.—K 12 A. About 4 miles south of Bowsman, midway between mileboard 104 and 1st telegraph pole north, and 3 ft. east of alignment of telegraph poles, of plate on concrete pillar.....	1063.994
96.84	T.B.M. 98. On telegraph pole at mileboard 102.....	1084.83
98.81	T.B.M. 100. On 1st telegraph pole north of mileboard 100.....	1100.90
100.14	Swan river, water, 1084.5; base of rail.....	1107.99
100.24	P.B.M.—K 13. On Canadian Northern Railway bridge over Swan river, on bolt set in north face of most westerly pier, about 4 ft. above ground.....	1091.399
100.28	P.M.B.—K 14. Swan River. On traffic bridge over Swan river, on plate set on top of south end of westerly abutment.....	1094.707
100.29	Manitoba Hydrographic Survey—B.M. 1. Swan River. On traffic bridge over Swan river, north end of westerly abutment, mark painted in black "M.H.S. + B.M. 1, elevation 110.37"	1094.71
100.31	Manitoba Hydrographic Survey—B.M. 2. Swan River. On traffic bridge over Swan river, north end of easterly abutment, close to railing of bridge, mark painted in black "M.H.S. B.M. 2, elevation 114.15".....	1098.507
100.47	P.B.M.—K 15. Swan River. Canadian Bank of Commerce building, in west wall about 6 inches south of northwest corner of building, on plate set in side of wall.....	1113.778
100.54	Swan River station, base of rail.....	1113.86

ATHABASKA RIVER.

Elevations of water and bench marks from crossing of Eighteenth Base Line west of the Fifth Meridian to Lake Athabaska.

MAP 414

Distance from Athabaska.	Locality and Description.	Elevat on.
Miles.		Feet.
87.6	Water, at crossing of 18th base line, 19.4 miles above confluence of Lesser Slave river. March 15th, 1914...	1836.6
87.0	Bench mark No. 6. On right bank 1,000 yds. below crossing of 18th base line, 30 ft. back from water's edge, on railway spike in 24 inch black poplar tree. Elevation...1860.17	
87.0	Water, opposite to B.M. No. 6.....	1835.5
84.0	Bench mark No. 5. On left bank, three quarters of a mile above crossing of north of sec. 24, tp. 69, rge. 2, 15 ft. back, from water's edge, on railway spike in 12 inch black poplar tree .....Elevation.1845.02	
84.0	Water, opposite to B.M. No. 5.....	1829.5
80.7	Bench mark No. 4. On left bank, 200 ft. below crossing of north of sec. 36. tp. 69, rge. 2, 6 ft. back from top of bank, on railway spike in 24 inch spruce tree Elevation....1841.47	
80.7	Water, opposite to B.M. No. 4.....	1825.3
77.0	Bench mark No. 3. On left bank, 20 ft. back from water's edge, on spike in 18 inch black poplar tree, about 1/4 mile below shack on right bank Elevation....1830.89	
76.8	Water, opposite to shack on right bank below rapids ...	1814.4
74.9	Bench mark No. 2. On right bank, opposite south end of small island, 30 ft. from water's edge, on railway spike in 18 inch spruce tree....Elevation....1829.31	
74.9	Water, opposite to B.M. No. 2.....	1807.3
72.0	Water, at crossing of north of sec. ..., tp. 70, rge. 1.....	1801.7
71.4	Bench mark No. 1. On left bank, opposite southwest end of large island, on nail in 24 inch spruce. Elevation....1820.03	
71.4	Water, opposite to B.M. No. 1.....	1800.9
68.0	Water, at confluence of Lesser Slave river.....	1797.7
73075—22½		

## ATHABASKA RIVER.

MAPS 414, 415

Distance from Athabaska.	Locality and Description.	Elevation.
Miles.		Feet.
66.5	Bench Mark—C 15. On left bank, 190 ft. west of E. by. sec. 26, t <sub>1</sub> . 71, rge. 1, 10 ft. back from top of bank, on railway spike in 20 inch poplar tree. Elevation.... 1811.75	
65.0	Bench Mark—120 S. (5th meridian). On left bank at crossing of 5th meridian, 66 ft. back from top of bank, and 5 ft. east of centre of line, on 10 inch poplar stump, 2½ ft. high..... Elevation..... 1821.20	
65.0	Water, at crossing of 5th meridian, February 9th, 1914.....	1796.0
62.0	Water. February 5th, 1912.....	1789.1
58.0	Water.....	1780.2
55.0	Bench Mark—C 13. On left bank at Moose Portage, on nail in lowest log at northeast corner of house, marked "B.M."..... Elevation... 1814.69	
55.0	Water, at Moose Portage.....	1774.0
50.0	Water.....	1771.4
46.0	Water.....	1768.0
43.0	Bench Mark—C 12. On left bank at Fish Cal. on nail in lowest log, at southwest corner of house, marked "B.M."..... Elevation.... 1777.79	
43.0	Water, at Fish Camp.....	1758.0
40.0	Water.....	1749.9
36.0	Bench Mark—C 11. On left bank at Tomato creek stopping place, on nail in lowest log, at southwest corner of bunk house, marked "B.M." Elevation.... 1762.09	
36.0	Water, at Tomato creek stopping place.....	1739.1
34.0	Bench Mark—C 10. On right bank at Old Indian Settlement, on nail in lowest log at northwest corner of middle house of five log houses, marked "B.M." Elevation.... 1765.27	
34.0	Water, at old Indian settlement.....	1738.1

ATHABASKA RIVER.

MAP 415

Distance from Athabaska.	Locality and Description.	Elevation.
Miles.		Feet.
30.0	Water.....	1730.3
28.0	Bench Mark C 9. On left bank at Longview stopping place, on nail in lowest log of middle of west wall of house, marked "B.M."..... Elevation, 1747.95	
28.0	Water, at Longview stopping place.....	1722.9
24.0	Water.....	1713.9
21.0	Bench Mark—C 8. On left bank at Jack-knife's stopping place, on nail in top of lowest log at southwest corner of Jack-knife's house..... Elevation, 1737.48	
21.0	Water, at Jack-knife's stopping place.....	1707.8
20.0	Water.....	1702.2
19.0	Bench Mark—C 7. On left bank at White's stopping place, on nail on top of spruce stump 65 ft. south of the south wall of stable..... Elevation, 1733.57	
16.0	Water.....	1696.0
12.0	Bench Mark—C 6. On right bank where three log houses and three stables are standing, on nail in top of lowest log at southeast corner of most south-westerly house..... Elevation, 1712.08	
12.0	Water, opposite the three log houses.....	1684.8
8.0	Bench Mark—C 5. On right bank at Dumont's stopping place, on nail in top of lowest log of Dumont's house, standing 200 ft. west of creek, marked "B.M."..... Elevation, 1720.64	
8.0	Water, opposite Dumont's stopping place.....	1679.5
7.0	Water, 1 mile below Dumont's stopping place.....	1673.7
1.5	Water, 1½ mile above Athabaska, 6th March, 1912 ..	1669.3
0.0	Water, at Athabaska. January 8th, 1914.....	1667.4
	Athabaska. Canadian Northern railway, base of rail at station..... Elevation, 1691.2	

## ATHABASKA RIVER.

MAP 415

Distance from Athabaska.	Locality and Description.	Elevation.
Miles.		Feet.
	Bench Mark—D 29. On Canadian Northern railway right of way, $\frac{1}{2}$ mile southeast of Athabaska station, 8 telegraph poles south of crossing of Tawatinaw river, 50 ft. west of centre of track, on top of iron pipe. . . . . Elevation, 1697.54	
0.5	Water, at mouth of Tawatinaw river, $\frac{1}{2}$ mile below Athabaska. . . . .	1666.5
3.0	Water, falling 1.81 feet per mile. . . . .	1661.8
5.0	Water, falling 1.59 feet per mile. . . . .	1657.6
6.1	Bench Mark—M 1. On Six Mile Island, on left side of river, 200 ft. south of north end of island, and 155 ft. west of east shore, on railway spike in 18-inch spruce tree. . . . . Elevation, 1674.74	
6.1	Water, at north end of Six Mile Island, falling 1.31 ft. per mile. . . . .	1655.3
9.0	Water, falling 1.38 feet per mile. . . . .	1651.0
11.7	Bench Mark—M 2. On left bank, in homestead owned by C. A. Parker, 265 feet upstream from log shack, 27 ft. back from river's edge, on railway spike in 10 inch poplar tree. . . . . Elevation, 1667.17	
11.7	Water, opposite Parker's log house, falling 1.41 feet per mile. . . . .	1647.7
13.0	Water, falling 1.05 feet per mile. . . . .	1645.6
15.0	Water, opposite "Twelve Mile shack," falling 1.61 ft. per mile. . . . .	1644.6
16.5	Water, south of Deep creek, falling 2.73 feet per mile	1640.5
19.1	Bench Mark—M 3. On left bank of river, 1,800 feet above sawmill, 30 feet back from river's edge, on railway spike in 12 inch spruce tree. . . . . Elevation, 1659.14	
19.7	Water, opposite to sawmill, falling 1.51 feet per mile. . .	1637.1
21.0	Water, falling 0.67 feet per mile. . . . .	1636.7

## ATHABASKA RIVER.

MAP 415

Distance from Athabaska.	Locality and Description.	Elevation.
Miles.		Feet.
22.6	Bench mark—M 4. On left bank at crossing of 18th base line, 20 ft. north of centre of line and 30 ft. back from water's edge, on railway spike in 24 inch spruce tree.....Elevation, 1651.75	
22.5	Bench Mark—M 5. On right bank at crossing of 18th base line, 10 ft. south of centre of line and 30 ft. back from water's edge, on railway spike in 12 inch spruce tree.....Elevation, 1651.25	
22.6	Water, at crossing of 18th base line north of M 4, falling 1.12 feet per mile, January 21st, 1914.....	1634.6
25.0	Water, falling 1.13 feet per mile.....	1632.2
28.0	Water, falling 0.76 feet per mile.....	1629.0
30.4	Bench Mark—M 6. On left bank opposite southerly end of Hardisty Island, 30 ft. back from water's edge, on railway spike in 24 inch spruce tree. Elevation, 1649.88	
30.4	Water, opposite to Bench Mark 6, falling 0.83 ft. per mile.....	1627.9
32.5	Water, falling 0.70 ft. per mile.....	1625.4
34.0	Water, " 1.12 " .....	1625.1
36.0	Water, " 1.70 " .....	1621.0
38.0	Bench Mark—M 7. On left bank directly opposite mouth of La Bienne river, 30 ft. back from water's edge, on railway spike in 21 inch spruce tree. Elevation, 1640.96	
38.0	Water, opposite Bench Mark 7, falling 1.20 ft. per mile.	1618.3
40.0	Water, falling 1.05 ft. per mile.....	1616.2
42.0	Water, " 1.02 " .....	1614.1
44.0	Water, " 0.88 " .....	1612.1
46.6	Bench Mark—M 8. On left bank, 2,000 ft. above crossing of north of sec. 19, tp. 70, rge. 19, and about 1 mile above Calling river, 30 ft. back from water's edge, on railway spike in 21 inch spruce tree. Elevation, 1632.49	

## ATHABASKA RIVER.

MAP 415

Distance from Athabaska.	Locality and Description.	Elevation.
Miles.		Feet.
47.0	Water, at crossing of north of sec. 19, tp. 70, rge. 19, falling 0.90 ft. per mile.....	1609.8
47.7	Water, at confluence of Calling river, falling 1.04 ft. per mile.....	1609.0
51.6	Bench Mark—M 9. On right bank, 4 miles below Calling river, on north of sec. 11, tp. 71, rge. 19, 15 ft. back from water's edge, on south side of line, on railway spike in 21 inch spruce tree. Elevation, 1627.76	
51.6	Water, at crossing of north of sec. 11, tp. 71, rge. 19, falling 0.97 ft. per mile.....	1604.5
54.0	Water, falling 1.60 ft. per mile.....	1603.3
56.3	Water, falling 2.73 ft. per mile. Swift Current Rapids.	1597.1
57.6	Bench Mark—M 10. On right bank, 1,800 ft. above crossing of north of sec. 11, tp. 72, rge. 19, 100 ft. back from water's edge, on railway spike in 21 inch black poplar..... Elevation, 1615.93	
57.6	Water, opposite to Bench Mark M 10.....	1594.8
58.0	Water, at crossing of north of sec. 11, tp. 72, rge. 19, falling 2.75 ft. per mile.....	1592.4
60.2	Water, falling 2.18 ft. per mile.....	1586.4
62.1	Water, " 2.81 " .....	1583.3
63.5	Bench Mark 163 (19th base line). On left bank where the river first crosses 19th base line going down stream, 38 ft. west of water's edge, and 708 ft. east of northeast corner of sec. 31, tp. 72, rge. 18, 5 ft. north of line, on nail in 15 inch spruce tree. Elevation.....	1597.84
63.5	Bench Mark—M 11. On left bank where the river first crosses 19th base line going down stream, 70 ft. west of water's edge and 45 ft. south of line, on railway spike in 15 inch spruce tree. Elevation 1599.29.	
63.5	Water, at first crossing of 19th base line, falling 3.00 ft. per mile. 17th February, 1914.....	1577.7
65.0	Water, at second crossing of 19th base line, falling 2.25 't. per mile.....	1574.7

ATHABASKA RIVER.

MAP 465

Distance from Athabaska.	Locality and Description.	Elevation.
Miles.		Feet.
65.8	Bench Mark 161. (19th base line). On right bank where the river crosses 19th base line the third time going down stream, 95 ft. east of waters' edge and 26 ft. west of witness mound, and 45 ft. south of line on nail in 10 inch spruce tree. . . . Elevation 1606.34..	
65.8	Water, at third crossing of 19th base line, falling 2.36 ft. per mile. . . . .	1572.7
68.1	Water, at mouth of Duncan creek, joining from east, falling 2.37 ft. per mile. . . . .	1567.6
70.0	Bench Mark—M 12. On left bank, two miles below Duncan creek, on north of sec. 21, tp. 73, rge. 18, 30 ft. west of top of bank, on railway spike in 15 inch spruce tree . . . . . Elevation, 1584.60	
70.0	Water, at crossing of north of sec. 21, tp. 73, rge. 18, falling 2.01 ft. per mile. . . . .	1562.8
72.0	Water at crossing of north of sec. tp. 73, rge. 18, falling 1.57 ft. per mile. . . . .	1559.8
74.2	Water falling 1.80 ft. per mile. . . . .	1556.2
76.3	Bench Mark—M 13. On right bank, 120 ft. north of N. by. of sec. 20, tp. 74, rge. 18, 40 ft. east of top of bank, on railway spike in 21 inch spruce tree, . . . . . Elevation 1574.44	
76.3	Water, at crossing of north of sec. 20, tp. 74, rge. 19 falling 1.72 ft. per mile. . . . .	1552.1
78.8	Water, at crossing of north of sec. 31, tp. 74, rge. 18, falling 2.70 ft. per mile. . . . .	1548.0
80.9	Water, falling 3.81 ft. per mile. . . . .	1540.1
81.9	Bench Mark—M 14. On left bank, half a mile above crossing east of sec. 18, tp. 75, rge. 18, 100 ft. west of top of bank, on railway spike in 12 inch black poplar tree. . . . . Elevation 1557.89	
82.4	Water, at crossing of east of sec. 18, tp. 75, rge. 18, falling 3.43 ft. per mile. . . . .	1534.3
85.0	Water, falling 3.43 ft. per mile. . . . .	1526.5

## ATHABASKA RIVER.

MAP 465

Distance from Athabaska.	Locality and Description.	Elevation.
Miles.		Feet.
87.4	Water, at crossing of north of sec. 32, tp. 76, rge. 18, falling 2.53 ft. per mile.....	1522.2
88.2	Bench Mark—M 15. On left bank, $\frac{3}{4}$ of a mile below crossing of north of sec. 32, tp. 76, rge. 18, and about 1,500 ft. above a group of three log shacks on left bank, and 150 ft. west of top of bank, on railway spike, in 15 inch spruce tree..... Elevation 1544.54	
88.2	Water, opposite Bench Mark M 13, falling 3.88 ft. per mile.....	1517.9
90.2	Water, falling 2.98 ft. per mile.....	1513.1
92.0	Water, falling, 3.40 ft. per mile.....	1508.2
94.4	Water, at crossing of 20th base line, north of tp. 76, rge. 18, falling 3.70 ft. per mile. March 6th, 1914..	1499.2
94.4	Bench Mark—M 16. On left bank at crossing of 20th base line. 145 ft. west of water's edge, on north side of line, on railway spike in 9 inch black poplar tree. Elevation, 1518.11	
94.4	Bench Mark—M 17. On left bank at crossing of 20th base line, 200 ft. west of water's edge, on south side of line, on railway spike in 9 inch black poplar tree. Elevation, 1521.12	
94.4	Bench Mark 177. (20th base line). On left bank, 120 ft. west of water's edge, and 51 ft. east of $\frac{1}{4}$ post on north of section 31, tp. 76, rge. 18, and 8 ft. south of line, on nail in 6 inch cottonwood tree. Elevation, 1523.15	
125.0	Water, at crossing of 21st base line north of tp. 80, rge. 17. Sept. 6th, 1913.....	1360.2
	Bench Mark 130 (21st base line). On right bank 594 ft. east of water's edge, on top of iron post' in centre of line marked "B.M. 130," 198 ft. east of $\frac{1}{4}$ post, on north of sec. 32, tp. 80, rge. 17. Elevation, 1410.69	
	Bench Mark 131 (21st base line). On left bank 614 ft. west of water's edge, on top of iron post marked "B.M. 131," 198 ft. east of mound at northeast corner of sec. 31, tp. 80, rge. 17. Elevation, 1381.93	

ATHABASKA RIVER.

MAPS 515, 566

Distance from Athabaska.	Locality and Description.	Elevation.
Miles.		Feet.
152.0	Water, at crossing of 22nd base line, north of tp. 84, rge. 17, at lower end of Grand Rapids. July, 1913..	1227.26
152.0	Bench Mark 186 (22nd base line). On right bank, 202 ft. east of water's edge, on top of iron post marked "B.M. 186," 775 ft. west of mound at north-east corner of sec. 33, tp. 84, rge. 17. Elevation, 1266.56	
152.0	Bench Mark 187 (22nd base line). On left bank, 41 ft. west of water's edge, on top of iron post marked "B.M. 187," 694 ft. east of ¼ post on north of sec. 33, tp. 84, rge. 17. Elevation, 1268.46	
225.0	Water, at crossing of 23rd base line, north of tp. 88, rge. 10. 19th September, 1911.....	816.2
231.0	Water, at MacMurray, estimated.....	795
250.0	Water, crossing of 24th base line, north of tp. 92, rge. 10. July 18th, 1913.....	773
	Bench Mark 83 (24th base line). East side of river, on mark T on boulder a little over ½ mile east of water's edge, and 371 ft. east of mound at N.E. cor. sec. 35. tp. 92, rge. 10. Elevation, 839.35	
	Bench Mark 84 (24th base line). West side of river, on top of iron post marked "B.M. 84," 42 ft. west of water's edge, and 1,118 ft. east of mound at N.E. cor. sec. 34, tp. 92, rge. 10. Elevation, 785.16	
281.0	Water, crossing of 25th base line. north of tp. 96, rge. 11. December 17th, 1913.....	761
	Bench Mark 91 (25th base line). West side of river, on top of iron post marked "B.M. 91," 729 ft. west of water's edge, and 198 ft. west of witness mound. Elevation, 774.56	
390.0	Chipewyan, Lake Athabaska, water. September 9, 1912	695

## LESSER SLAVE RIVER.

Elevations of water and of bench marks from confluence with Athabaska River to Lesser Slave Lake.

MAP 414

Distance from Athabaska River.	Locality and Description.	Elevation.
Miles.		Feet.
0.0	Water, at confluence with Athabaska river, Feb. 5, 1914	1798.0
0.2	Bench Mark—N 3. On right bank of Lesser Slave river, about 1,200 ft. above confluence with Athabaska river, and opposite to Captain Barber's house at Port Cornwall, 10 ft. back from water's edge, on railway spike in 12-inch spruce tree. . . . . Elevation, 1805.45	
0.2	Bench Mark—N 3A. On right bank of river, 50 ft. back from Bench Mark No. 3, and 60 ft. back from water's edge, on top of bank, on railway spike in 14-inch spruce tree. . . . . Elevation, 1825.98	
1.0	Water, falling 3.55 ft. per mile. . . . .	1803.3
2.0	Water " 3.60 " . . . . .	1805.1
3.0	Water " 3.85 " . . . . .	1810.5
4.0	Water " 2.15 " . . . . .	1812.8
4.5	Bench Mark—N 4. On left bank, about 2½ miles below "7 mile stopping place," 20 ft. back from water's edge, on nail in root of 16-inch spruce tree. Elevation, 1823.57	
5.0	Water, falling 2.15 ft. per mile. . . . .	1814.8
6.0	Water " 2.07 " . . . . .	1817.1
6.7	Water, at foot of rapids. . . . .	1818.4
7.0	Water, falling 5.91 ft. per mile. . . . .	1820.6
8.0	Water " 4.25 " . . . . .	1825.5
9.0	Water " 4.55 " . . . . .	1829.1
10.0	Water " 5.00 " . . . . .	1834.2
10.5	Water, opposite Rummell's stopping place, falling 4.10 ft. per mile. . . . .	1836.6
10.6	Bench Mark—N 5. On right bank about 450 ft. above Rummell's stopping place, 30 ft. back from water's edge, on nail in 14-inch spruce tree. Elevation, 1842.80	

LESSER SLAVE RIVER.

MAP 414

Distance from Athabaska River.	Locality and Description.	Elevation.
Miles.		Feet.
11.0	Water, falling 5.70 ft. per mile.....	1838.3
12.0	Water " 7.35 " .....	1846.3
13.0	Water, " 5.10 " .....	1853.0
14.0	Water " 5.20 " .....	1856.5
14.7	Water, opposite to Donaldson's stopping place, falling 3.45 ft. per mile.....	1852.7
15.0	Bench Mark—N 6. On left bank about 1650 ft. above Donaldson's stopping house and 600 ft. below the mouth of Moose river, 30 ft. back from water's edge, on nail in 15-inch poplar tree..... Elevation, 1869.13	
15.00	Water, opposite to B.M. No. 6, falling 5.00 ft. per mile	1863.4
15.2	Water, at mouth of Moose river, falling 3.58 ft. per mile	1864.4
16.0	Bench Mark—N 7. On left bank about 0.8 miles above the mouth of Moose river, 15 ft. back from water's edge on nail in 12-inch spruce tree..... Elevation, 1875.08	
16.0	Water, opposite, to B.M. No. 7, falling 3.30 ft. per mile	1867.1
17.0	Water, falling 2.65 ft. per mile.....	1869.0
18.0	Water, falling 4.64 ft. per mile.....	1872.4
18.8	Water, at head of rapids.....	1877.1
19.1	Bench Mark—N. 8. On right bank immediately above confluence with Sauteux river, 8 ft. back from water's edge, on nail in 12-inch poplar tree..... Elevation, 1883.54	
19.2	Water, at Sauteux Landing, falling 1.50 ft. per mile...	1877.7
19.8	Water, at mouth of Sauteux river.....	1878.6
21.0	Water, falling 0.60 ft. per mile.....	1879.1
22.0	Water, falling 0.70 ft. per mile.....	1879.8
23.0	Water, falling 0.90 ft. per mile.....	1880.5
23.8	Water, at mouth of Otawau river, falling 1.00 ft. per mile	1881.4

## LESSER SLAVE RIVER.

MAP 464

Distance from Athabaska River.	Locality and Description.	Elevation.
Miles.		Feet.
25.1	Bench Mark—N 9. On right bank, $1\frac{1}{4}$ miles above mouth of Otawau river, 15 ft. back from water's edge, on nail in 10 inch spruce tree. Elevation, 1890.32	
25.1	Water, opposite to B.M. N 9, falling 0.65 ft. per mile..	1882.0
26.0	Water, falling 0.55 ft. per mile.....	1882.5
27.0	Water, falling 0.25 ft. per mile.....	1883.1
28.5	Bench Mark—N 10. On left bank at Chase's stopping place, on railway spike driven horizontally in log at north corner of most southerly barn, about 1 ft. above ground and 1 ft. south east of corner. Elevation, 1896.71	
28.5	Water, opposite to Chase's stopping place, falling 0.37 ft. per mile.....	1883.5
30.0	Water, falling 0.50 ft. per mile.....	1884.2
31.0	Water, falling 0.90 ft. per mile.....	1885.0
32.0	Water, falling 0.60 ft. per mile.....	1886.0
33.0	Water, falling 0.47 ft. per mile.....	1886.2
33.4	Water, at Stoney's stopping place.....	1886.5
<hr/> <p><i>Line of levels here leaves Lesser Slave river and goes overland to Sawridge.</i></p>		
36.8	Water, in Muskeg lake..... Elevation, 1891.6	
38.1	Bench Mark—N 12. About $2\frac{1}{2}$ miles from Sawridge, and 220 ft. easterly along the Winter road from the edge of a small lake, and 70 ft. north of the road, on nail in 22 inch pine tree. Elevation, 1901.00	
38.2	Water, in small lake..... Elevation, 1897.30	

LESSER SLAVE RIVER.

MAP 464

Distance from Athabaska River.	Locality and Description.	Elevation.
Miles.		Feet.
40.6	Bench Mark—N 13. At Sawridge, Hudson's Bay Company's factor's house, on railway spike in log one ft. south of the northwest corner of the house, and 6 inches above ground. Elevation, 1895.79	
40.6	Bench Mark—N.14 At Sawridge, on railway spike in telegraph pole, 1 ft. southwest of southwest corner of Government Telegraph office. Elevation, 1896.85	
41.1	Bench Mark—N 15. At Sawridge, on L'hirondelle's house, at west end of the town, on railway spike driven horizontally into squared log, at southeast corner of house, about 1 ft. above ground. Elevation, 1900.00	
41.5	Lesser Slave lake, water, March 2nd, 1914.....	1892.4

## PEACE RIVER.

## Elevations of Water and of Bench Marks.

MAPS 513, 563

Distance from Peace River Crossing.	Locality and Description.	Elevation.
		Feet.
Miles.		
240	Water at Hudson Hope.....	1513.0
63	High land overlooking Dunvegan, north side.....	1725.0
63	Water at Dunvegan.....	1090.0
0	High land overlooking Peace River Crossing, east side..	1715.0
0	Water, at Peace River Crossing.....	1025.0
7	Water, at crossing of 22nd base line, north boundary of tp. 84, rge. 21.....	1015.0
10	Bench Mark No. 208, (22nd base line). On right bank on southwest side of a small creek flowing into Peace river, about three miles below 22nd base, on an 8 inch poplar at edge of timber, Elevation, 1035.6	
10	Water, at mouth of small creek on right bank, September 25th, 1911.....	1011.0
35	Water, at mouth of Whitemud river, three miles above crossing of 23rd base line.....	987.0
37	Bench Mark No. 151, (23rd base line). On left bank .. ft. west of water's edge and 373 ft. west of mound at N.E. cor. sec. 35, tp. 88, rge. 21, on notch on 18 inch spruce tree, marked "B.M. CLI" Elevation, 1045.3	
40	Water, at mouth of Cadotte river, three miles below crossing of 23rd base line, August 31st, 1912.....	980.0
73	Water, at crossing of 24th base line, N. by. tp. 92, rge. 20, April 19th, 1913.....	937.0
73	Bench Mark No. 32, (24th base line). On right bank 230 ft. east of water's edge, and 1391 ft. west of 1/2 post on N. by. sec. 31, tp. 92, rge. 20, on top of iron post, in centre of line, marked "B.M. XXXII" Elevation, 961.1	
73	Bench Mark No. 31, (24th base line). On left bank ft. west of water's edge and 43 ft. east of witness mound, on top of iron post in centre of line, marked "B.M. XXXI" Elevation, 964.7	
103	Water, at mouth of Battle river, estimated.....	924.0
110	Water, at crossing of 25th base line, N. by. tp. 96, rge. 20. June 17th, 1913.....	921.0

PEACE RIVER.

MAP 583

Distance from Peace River Crossing.	Locality and Description.	Elevation.
Miles.		Feet.
110	Bench Mark No. 13 (25th base line). On right bank, 200 ft. east of east bank and $\frac{1}{4}$ mile west of N.E. cor. sec. 36, tp. 96, rge. 20, on top of iron post in centre of line, marked "B.M. XIII." Elevation, 976.5	
110	Bench Mark No. 14 (25th base line). On left bank, 411 ft. west of west bank and 230 ft. west of witness mound, on top of iron post in centre of line, marked "B.M. XIV." Elevation, 1014.2	
150	Water, at crossing of 26th base line, N. by. tp. 100, rge. 20. July 16th, 1913.....	888.0
150	Bench Mark No. 10 (26th base line). On right bank, 53 ft. east of east bank and 356 ft. west of mound at N.E. cor. sec. 36, tp. 100, rge. 20, on top of iron post in centre of line, marked "B.M. X." Elevation, 908.7	
150	Bench Mark No. 11 (26th base line). On left bank, 348 ft. west of west bank and 645 ft. east of mound at N.E. cor. sec. 35, tp. 100, rge. 20, on top of iron post in centre of line, marked "B.M. XI." Elevation, 914.3	
158	Water, at mouth of Wolverine river, 8 miles below crossing of 26th base line, estimated.....	884.0
172	Water, at mouth of Keg river, 22 miles below crossing of the 26th base line, estimated.....	877.0
191	Water, at crossing of 27th base line, N. by. tp. 104, rge. 18. July 30th, 1913.....	868.0
191	Bench Mark No. 5 (27th base line). On right bank, 140 ft. east of water's edge, and nearly $\frac{1}{2}$ mile west of N.E. cor. sec. 32, tp. 104, rge. 18, on top of iron post, in centre of line, marked "B.M. V." Elevation, 952.2	
191	Bench Mark No. 6 (27th base line). On left bank, 363 ft. west of water's edge, and 304 ft. west of witness mound, on top of iron post, in centre of line, marked "B.M. VI." Elevation, 889.2	

924.0  
921.0

## PEACE RIVER.

MAPS 663, 664

Distance from Peace River Crossing.	Locality and Description.	Elevation.
		Feet.
Miles.		
197	Water, at crossing of E. by. sec. 1, tp. 105, rge. 18. July 28th, 1913.....	867.0
197	Bench Mark No. 100 (East of rge. 18). On right bank, 58 ft. south of water's edge, and 1462 ft. north N.E. cor. sec. 36, tp. 104, rge. 18, on top of iron post, in centre of line, marked "B.M. C." Elevation, 885.1	
197	Bench Mark No. 101 (East of rge. 18). On left bank, 30 ft. north of water's edge, and 1573 ft. south of $\frac{1}{4}$ post, on E. by. sec. 12, tp. 105, rge. 18, on top of iron post, in centre of line, marked "B.M. C I." Elevation, 889.0	
202	Bench Mark No. 12 (27th base line). On right bank, ft. west of the water's edge where the 27th base line crosses the westerly side of a southerly bend in the river, and $\frac{1}{4}$ mile east of N.E. cor. sec. 34, tp. 104, rge. 17, on top of iron post, in centre of line, marked "B.M. XII." Elevation, 885.0	
202	Water, where the 27th base line crosses the river in range 16 at the easterly side of the southerly bend, and south-east of an island. August 11th, 1913.....	857.0
205	Bench Mark No. 13 (27th base line). On right bank, 206 ft. east of witness mound near water's edge, on the easterly side of the southerly bend, on top of iron post, in centre of line, marked "B.M. XIII." Elevation, 897.8	
260	Water, at Fort Vermilion, estimated.....	825.0
355	Water, at crossing of fifth meridian, E. by. sec. 24, tp. 111. September 7th, 1911.....	758.0
495	Water, at confluence with Slave river, estimated.....	692.0

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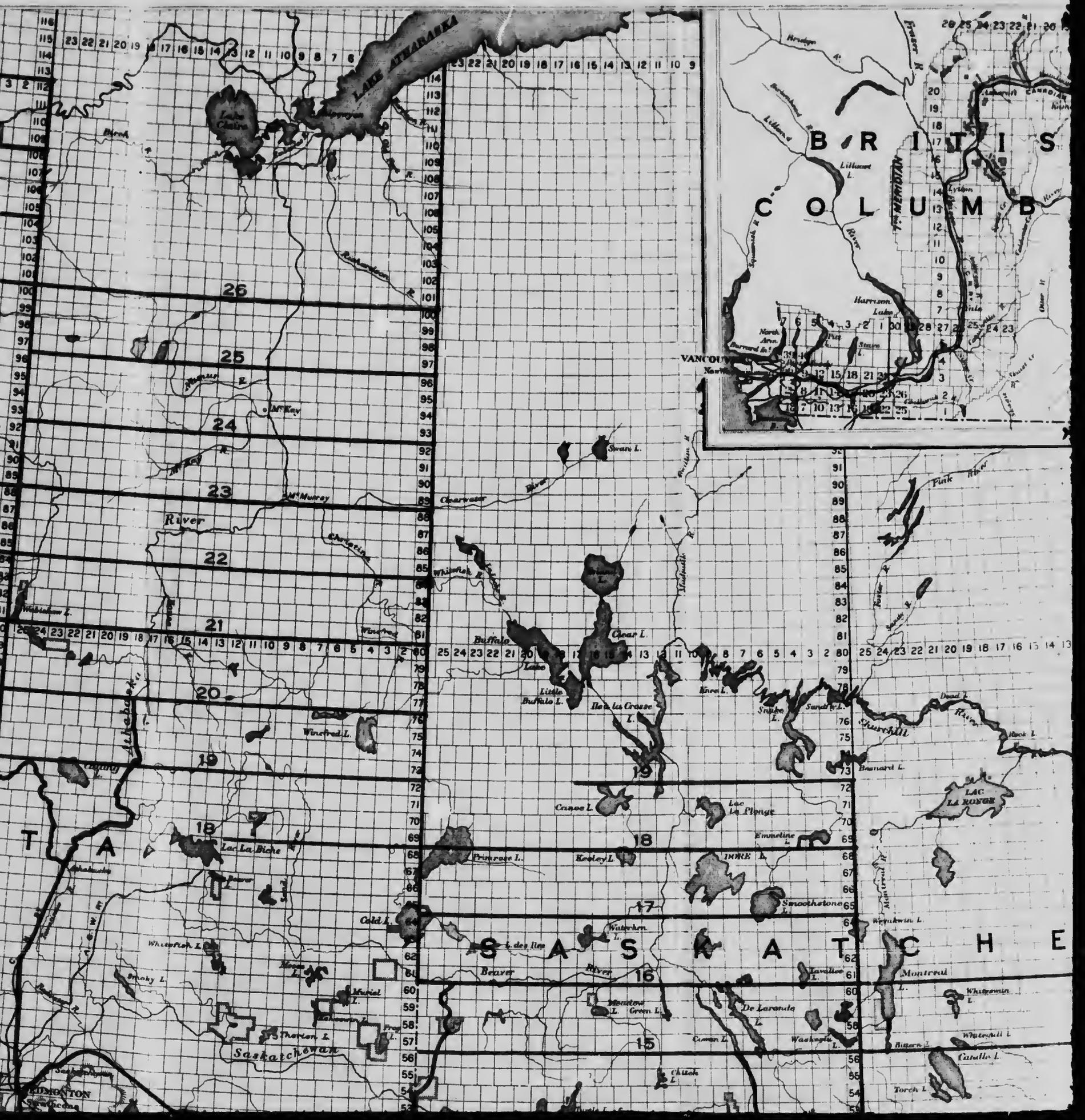
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# TOWNSHIPS IN MANITOBA, SASKATCHEWAN, ALBERTA

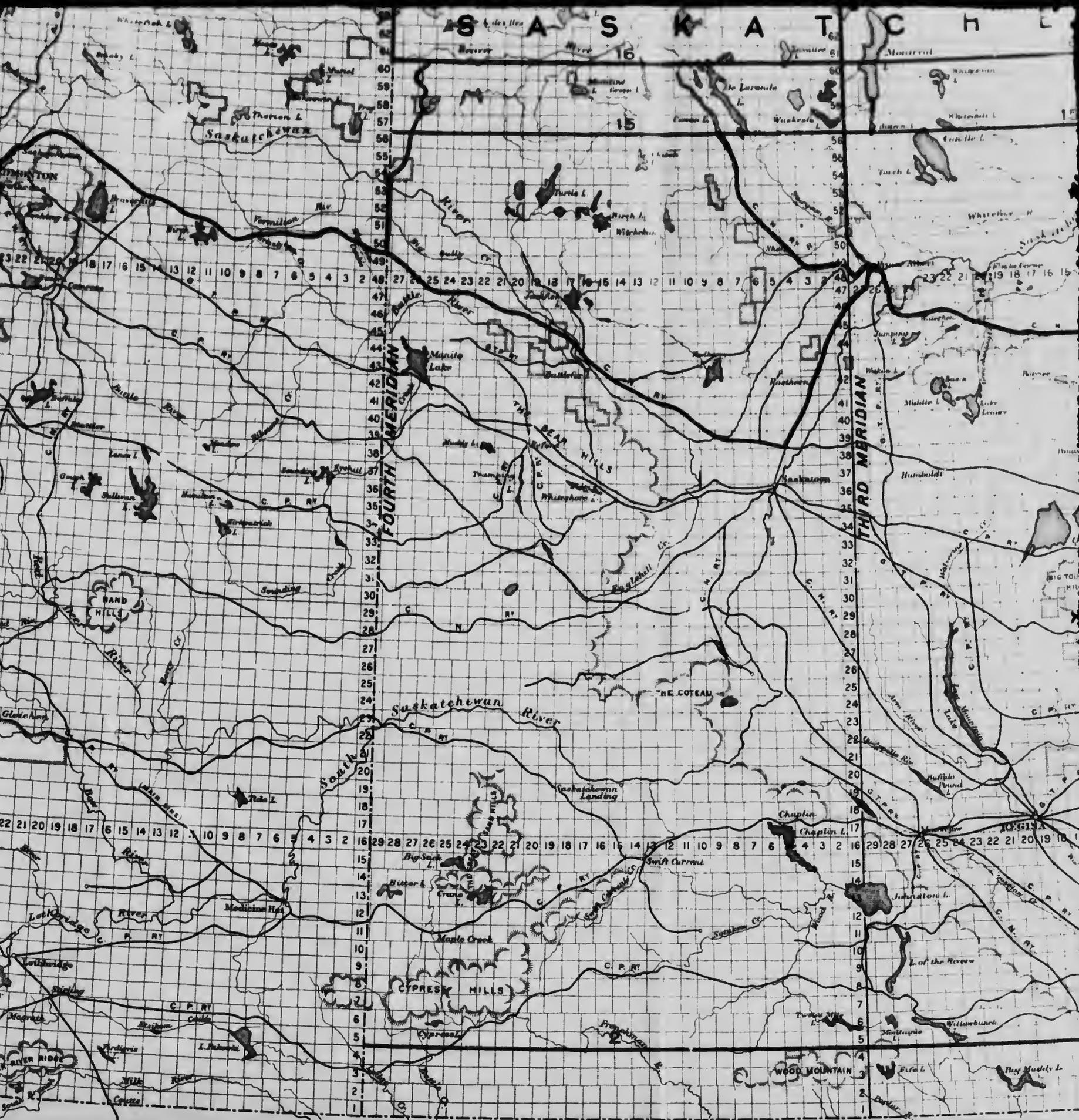
SHOWING LINES OF LEVELS RUN BY THE TOPOGRAPHICAL SURVEYS BRANCH.











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# SASKATCHEWAN



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