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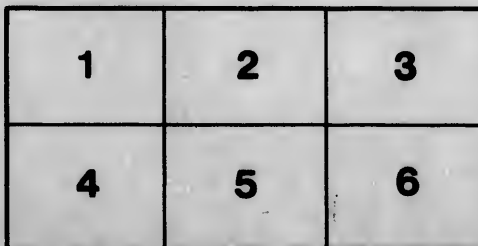
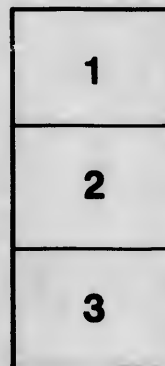
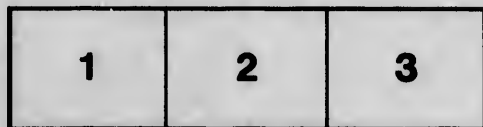
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THE GREAT NORTH-WEST:

The Field for Investment.

The Home of the Emigrant.

BY

JOHN MACOUN, M.A.

DOMINION GOVERNMENT EXPLORER OF THE NORTH-WEST

With Maps prepared by the Dominion Government.

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PREFACE

FREQUENT demands upon my time and patience for information regarding the North-West have compelled me to put in book form the gleanings of the past ten years.

In the volume now offered to the public I have attempted to give a truthful description of the greater part of the country suitable for the habitation of civilized man. Several chapters are devoted to its Natural History and Botany. These may be considered as a compendium of our present knowledge.

In the chapters on the capabilities of the soil, stock-raising, climate, &c., I have spoken from my own knowledge and on my own authority. Where my own knowledge of any matter was considered insufficient, I have quoted from other writers of known ability and truthfulness.

Statements from actual settlers are in their own words, and as their addresses are given these can be verified. Nearly every matter pertaining to the country has been touched upon, and where thought worthy elaborated. To give the work that completeness to which it aspires appendices have been added by other writers on matters for which their knowledge specially fitted them.

As qualifications for writing the work I may mention a twenty years study, theoretical and practical, of Botany, Natural History, and Physical Geography.

AFTER ten years study of these subjects I accompanied, as botanist, Mr. Sandford Fleming, and the author of "Ocean to Ocean," on their celebrated expedition across the continent. In the year 1875 I was appointed botanist to the expedition, which, under the leadership of the Director of the Geological Survey, explored the Peace River and Rocky Mountains. Two

years later I was asked by the Dominion Government to write a report on the North-West Territories, and availed myself of all reliable information regarding the country. The summers of 1879-80-81 have been spent in traversing the least known parts and investigating the forma, flora, meteorology and physical phenomena of the country. It will thus be seen that my opportunities have been ample.

Of the imperfections of the book I need not speak. The critics will point out these. In writing I have had the delight of revisiting in imagination many a cheery camp-fire, and many a scene of vast and lonely beauty, on which memory loves to dwell, and of feeling that I was endeavoring to describe to my fellow-countrymen, with simplicity and truthfulness, a portion of that magnificent heritage of which as yet they know so little.

JOHN MACOUN.

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[CHAPTER WRITTEN BY ALEX. BEGG, Esq.]

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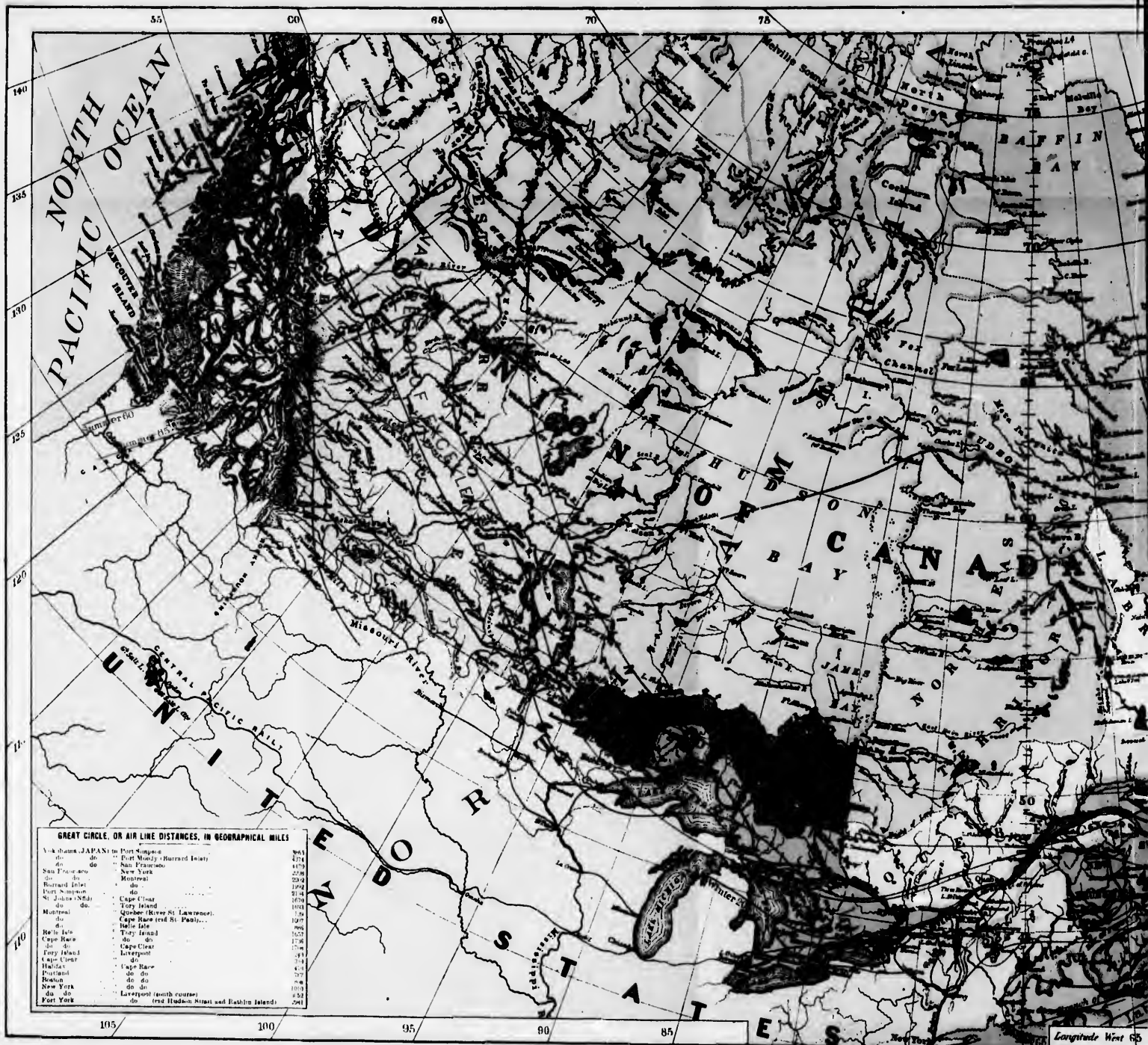


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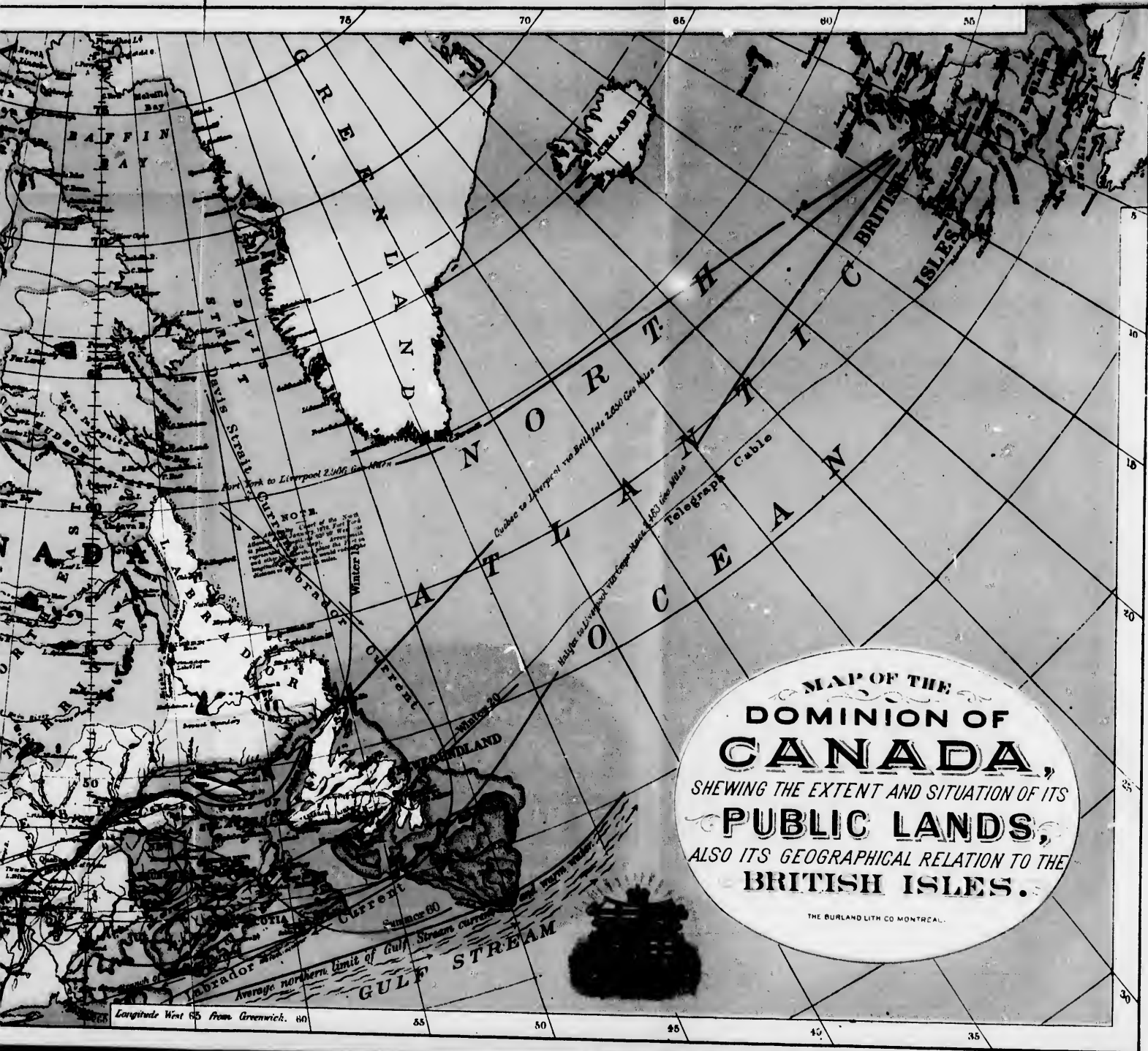
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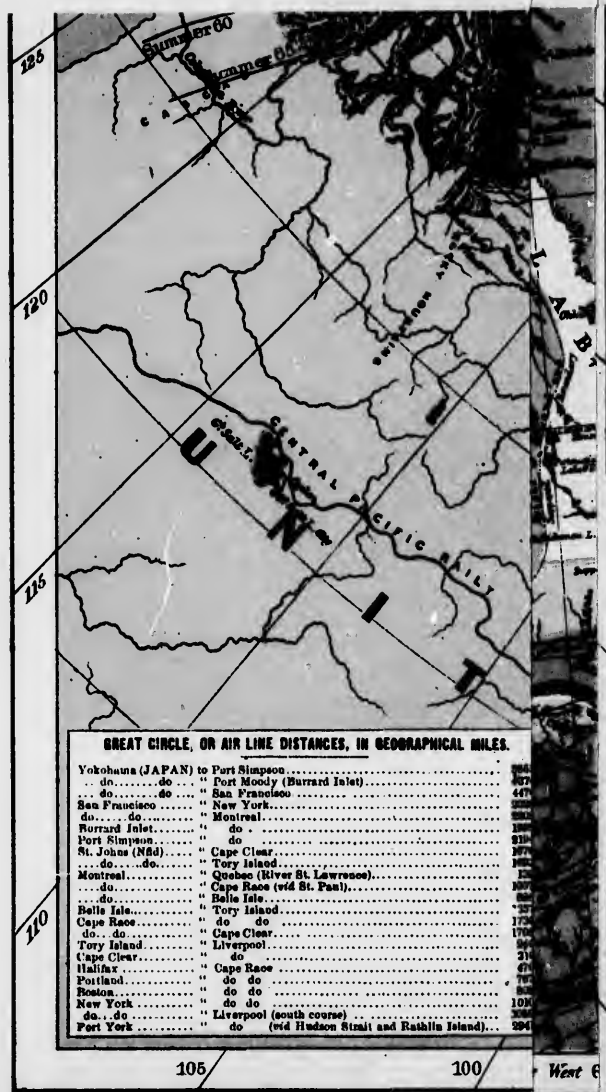
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MANITOBA AND THE GREAT NORTH-WEST.

CHAPTER I.

General Geography.

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THE Dominion of Canada includes at present all British America, except Newfoundland, which still elects to remain a Crown colony. Beginning at the East, it includes the Provinces of Nova Scotia, New Brunswick, and Prince Edward Island. These were formerly called the Maritime Provinces. Upper and Lower Canada are now Ontario and Quebec. Manitoba and the North-West Territories extend from the boundary of Ontario to the crest of the Rocky Mountains, and west of this range and the 120th Meridian lies British Columbia, which includes the two old Crown colonies of Vancouver's Island and British Columbia.

This vast domain extends from the Atlantic to the Pacific, and is equal in size to the United States, or a square of 1,770 miles. It includes about 3,000,000 square miles.

The Province of Nova Scotia consists of the Peninsula of Nova Scotia and the Island of Cape Breton. These lie to the south-east of New Brunswick and Prince Edward Island, and form the most eastern part of the Dominion. The Peninsula of Nova Scotia is of a triangular shape, and

is connected with New Brunswick by an isthmus sixteen miles wide. Its surface is undulating and picturesque and is dotted over with many small and beautiful lakes, which contain multitudes of fine fish.

Nova Scotia is rich in minerals, having no less than three extensive coal fields, which are destined, owing to the fostering care of its Government, at no distant day, to be a large source of revenue to the Province, as it owns the mines and receives a royalty on all coal taken from them. Iron, gypsum, and gold are not only abundant, and a source of present wealth to many, but hold out future prospects of large returns for foreign investments. The best agricultural lands of Nova Scotia are situated at the head of the Bay of Fundy, though the soil almost everywhere is good. Nova Scotia has been long noted for its apples, of which vast quantities are shipped to England.

Halifax, the capital of Nova Scotia, is situated on one of the finest harbors in America. Owing to its proximity to the Gulf Stream, the harbor rarely freezes over. This fact and the position of the city as the terminus of the Intercolonial Railway have made Halifax the winter port of the Dominion. Owing to the excellent construction and management of the Intercolonial, it is fast growing in favor with the travelling public.

Besides farming and mining, a large number of the inhabitants are engaged in the coast and deep sea fisheries, which are very remunerative. Ship-building is extensively carried on and gives employment to numerous mechanics and others. On the whole, taking into consideration its mining, fishing, farming, and ship-building, Nova Scotia can support a far larger population in affluence than she now possesses.

New Brunswick lies northwest of Nova Scotia, and has many points in common, but differs in shape, being very

compact and little broken by narrow bays. Numerous large bays indent its coast on the side of the Gulf, and here ship-building and lumbering operations are extensively carried on. The surface of the Province is very much diversified, and mountain and valley, noble rivers and clear lakes follow each other in quick succession throughout its whole extent. Much of the surface is still covered with forest, but along the rivers and in the valleys excellent farms and farming lands are to be seen.

This Province possesses three fine rivers which add much to its value, as by means of these the timber cut in the forests can be floated down to the sea or used in the construction of ships for which New Brunswick is justly noted. The St. John is 450 miles long, and is navigable from Fredericton, the capital, to its mouth, a distance of eighty-four miles. Small steamers ply on the river above the city for 120 miles further, or up to the Great Falls, which are eighty feet high. The Miramichi is 225 miles long and navigable for thirty miles from its mouth, which is very wide, and here many large ship-building establishments are located. The Restigouche is 200 miles long, and forms the boundary between Quebec and New Brunswick. Both the latter rivers flow into the Gulf of St. Lawrence, while the St. John empties into the Bay of Fundy.

Like Nova Scotia, New Brunswick possesses mines of coal and iron, and she has also abundance of lead, asphalt, granite, marble, and other valuable minerals. Besides timber and ships, her exports are grain, fish, iron, coal, lime, and gypsum. The resources of the Eastern Provinces have of late been greatly developed, and their trade is every month increasing in volume.

Prince Edward Island is very fertile and possesses a salubrious climate. Its inhabitants are chiefly engaged in farming and fishing, and are well repaid for their labor in both cases. The island is crescent-shaped, about 130 miles

long, with an average breadth of thirty-four miles. In general the land is very level, and being free from rock is easy of tillage and very productive. Immense quantities of potatoes are raised and exported to Boston and other cities along the coast, where they bring ready sale at remunerative prices.

The climate of all three Provinces is alike as regards the autumn, which is delightful in the extreme. Nova Scotia has less extremes of heat and cold, but is more subject to chilling fogs than either of the others. New Brunswick has cold winters and late springs, but the summers are warm and growth is rapid. Owing to the insular position of Prince Edward Island, its climate is less liable to extremes than that of the other Provinces. As a rule, the air is dry and bracing, the winters are cold and the summers tempered by the sea breezes.

Quebec may be said to lie in the valley of the St. Lawrence. It extends from the mouth of the river to some distance west of Montreal. The 45th parallel separates it from the United States, while the Ottawa river is its boundary on the side of Ontario. Since its discovery, Quebec has been noted for its vast Pine forests, its noble rivers and lakes, and its magnificent scenery. The increasing trade of Montreal, owing to the development of the west, has caused business men to bestir themselves, so as to retain the traffic that is flowing to their doors, and a consequence of this action is the development of their railway system by which they are in communication with all points of the compass. The St. Lawrence has been deepened, and vessels drawing twenty feet of water come to Montreal to load.

Besides the Western trade in grain and other products, the Ottawa and its various branches send large rafts of timber to Quebec, from whence it is exported to England. Much fertile land is to be found in Quebec, especially in

the Eastern Townships and in the Ottawa valley, and there are large deposits of iron, copper, and lead, which are worked with success in many parts of the Province. Many other minerals of use in the arts are obtained, but of late years, none have been more talked of than the Phosphate mines, north of Ottawa. Gold is obtained by washing in many streams to the south of the St. Lawrence, the principal of which is the Chaudière, near Quebec, where for a number of years, gold washing has been carried on.

Ontario presents the appearance of a triangular peninsula, and is bounded on the south and southeast by Lakes Erie and Ontario, and the River St. Lawrence, and on the west by a line still undefined. To the north and northwest, there are immense forests, which are now, and will be for years to come, a source of great wealth to its inhabitants, as all the public lands belong to the people of the Province.

The surface rises in no place into what may be called a mountain, but, as a rule, the whole of the country is undulating, and where not encumbered with rock, fit for the plough. It is only along Lake Superior and the Georgian Bay, where high rugged hills and precipitous cliffs give a barren and desolate aspect to the scenery that other than fertile lands can be seen. The Laurentian Hills run westward from the Thousand Islands, below Kingston, to the Georgian Bay, and continue northwestward by Lake Superior to the Lake of the Woods and Lake Winnipeg. North of this line of hills the country, instead of being continuously fertile, is much broken by rocky ledges, small lakelets, swamps, and sandy tracts; but, nevertheless, there is still much fine rich land throughout this region, and experience proves that the farmer can plough up to the rocky ledge without any difficulty.

All the rivers of Ontario flow either into the St. Lawrence or the Great Lakes. Owing to the diversified charac-

ter of the country, these are numerous, but unimportant as regards internal communication. Besides rivers, many beautiful spring brooks traverse the country in all directions, and these connecting with multitudes of small lakes filled with the best of game-fish, enable the sportsman or farmer to have pleasure or profit, or both, without going far from home. The small clear streams spoken of are now becoming of great value and will be increasingly so in the future. Within a few years, cheese factories have become very numerous, and the manufacture of cheese a leading industry. Soon butter factories will be added, and then Ontario's rich pastures "by the brooks" will be valued as they should, and grain raising become a thing of the past.

Water power sufficient to grind all our wheat and manufacture all our clothing has been going to waste for ages, but now the spirit of enterprise has taken possession of our people, and manufacturing establishments are rising on every hand. On the Trent alone, there are over twenty miles of rapids, where innumerable mills could be erected for every purpose. At present, the Government contemplate the formation of a canal by means of this river, to connect the waters of Lake Ontario with the Georgian Bay, so that the grain of the West may find a sure and speedy transit to the East. Should this canal be built, manufacturing towns will, as a matter of course, rise along its track, and the dream of many will be a glad reality. To the capitalist, there is no better field on the American continent for investment, than is presented by Ontario to-day.

Minerals of almost every description are abundant in the Laurentian Hills. Silver mining on Lake Superior, gold mining in Madoc, iron mines in various places, of surpassing richness and great extent, would surely place Ontario in a prominent position as a mining country, yet these are not all; on the shores of Lakes Huron and St. Clair are large

deposits of salt and petroleum, which seem well nigh inexhaustible. Northeast of Kingston, phosphate is found everywhere. Lead, gypsum, marble, copper, graphite, lithographic stone, and numerous other metals and minerals exist in workable quantities in many places, but hitherto, the want of capital has prevented their development.

Of the fruits of the soil, Ontario may justly be proud; her apples to-day stand A 1 in the English markets. Peaches and grapes are grown in enormous quantities, and the latter are now raised without difficulty in every part of the Province. Barley grown along Lake Ontario is altogether superior to anything that can be produced in the United States, and always commands a good price. All other grains are raised in abundance. Ontario wheat has long been known as a first-class article, and is only excelled now by that of its sister Province, Manitoba.

Keywadin is a tract of rough, broken country, lying between Ontario and the North-West Territories. Its southern boundary is the United States, and its northern the shores of Hudson's Bay. This region is but little known in its eastern part, but may be characterized as a land of rocks, lakes, rivers, marshes, and muskegs, with occasional ISLANDS, or small patches, of good land intermixed. Along Rainy River, there is a belt of very rich land, but this is overshadowed at present by the fertile lands of Manitoba, which fill men's minds to the exclusion of everything else. The boundary question is not yet settled, but when it is, Keywadin will pass out of existence and become merged in Ontario and Manitoba.

Manitoba, by the Act of 1880, had its boundaries extended, so as to include the greater part of the existing settlements formed, during the past few years, along the western boundary. As now extended, it reaches from the Ontario boundary on the east to $101^{\circ} 30'$ west long.,

and from the International Boundary on the south to the Saskatchewan and Lake Winnipeg on the north.

The North-West Territories extend from Manitoba westward to the crest of the Rocky Mountains. Where the Rockies cross the 120th Meridian, that line is taken as the eastern boundary of British Columbia. All the vast tract enclosed between these lines and extending indefinitely to the north, is known by the general term of North-West Territories. British Columbia is that portion of the Dominion which extends from the western boundary of the North-West Territories to the Pacific, and includes Vancouver Island and Queen Charlotte's Islands. Its western boundary is the Pacific, from lat. 49° to the head of Portland Channel, in lat. 56° . From this point, the line passes at a distance of twenty-five miles from tide water, northwesterly, until it reaches the 143rd Meridian. The 60th parallel is its northern boundary. As a separate chapter will be written on this Province, I shall merely notice that, were it for no other reason than its position, British Columbia is a necessity to the Dominion. Besides position, it has forests of unsurpassed excellence, fisheries without a rival, coal fields unequalled on the West coast, a climate at once mild and salubrious, and rivers flowing over "golden sands." It is well known that from its southern boundary to its most northern explored point, gold in paying quantities has been found.

The North-West Territories and Manitoba may be characterized as a vast plain, gently sloping to the north and northeast. Its southeastern extremity (at Emerson), is about 700 feet above the sea, and rises gradually as we proceed west, until it reaches an altitude of nearly 4,000 feet at the base of the Rockies, on the International Boundary. Lake Winnipeg, which receives the waters of the interior is only 627 feet above the sea. It will be seen that from the Rocky Mountains to Lake Winnipeg, a distance, in

round numbers, of 1,000 miles, the fall is about 3,000 feet, or three feet to the mile. In this 1,000 miles there are two lifts, of over 600 feet each, which serve to divide the prairie country into three great subdivisions, having the same general characteristics.

Under the name of the First Prairie Steppe, is included the low plain of Manitoba, bounded by a line of elevated country which commences on the International Boundary, at a point some distance west of Emerson, and extends northwestwardly under the names of Pembina, Riding, Duck, Porcupine, and Pas Mountains to near Cumberland House, on the Saskatchewan, in long. 102° west and lat. $53^{\circ} 37'$ north. This plain, in its southern part, being more elevated, is drier and better fitted for agriculture than the northwestern part, where Lakes Manitoba and Winnipegosis and their surrounding marshy lands take up much of the surface. The soil, however, in the northern part is exceedingly rich, and marshy meadows covered with tall grass, take the place of the weedy or grassy prairies of the south. The soil of this lower plain is a dark-colored or black alluvium of great depth and almost inexhaustible fertility.

Ascending the broken hills, or face of the escarpment which is the eastern slope of the "Mountains" spoken of above, the traveller is surprised to find that the "Mountain" has disappeared, and he stands on a plain almost as level as the one left behind, but much better adapted to farming purposes, as the soil is warmer, the surface more rolling, and therefore drier, and water of a better quality and more plentiful in the form of brooks. This is the Second Prairie Steppe, and contains an enormous quantity of excellent land.

Its boundary on the east has been already described, and the International Boundary, for 270 miles, is its southern one. The Coteau de Missouri, crossing the Boundary

in long. $103^{\circ} 30'$ west, sweeps up to the northwest and crosses the South Saskatchewan in lat. $50^{\circ} 45'$, where it takes the name of the Bad or Bear Hills. Passing northward it becomes the Eagle Hills, about fifty miles to the east of Battleford. This range of hills is about ten miles to the south of Battleford, in lat. $52^{\circ} 35'$, and from thence the elevated country extends northwesterly to Lac la Biche, in lat. 55° . Groups of drift hills are scattered at intervals over this plateau, but anything to be called a mountain has no existence. The Turtle and Moose Mountains, Brandon Hills, Pheasant Hills, File Hills, Touchwood Hills, and other small groups found at various points can scarcely be called hills. They are in most cases merely a series of ridges, and rounded drift eminences encompassed by marshes and lakelets, which prevent the destruction of their forests at uncertain intervals. Therefore the wood ranges on them from mere twigs of a year old, up to trees eighteen inches in diameter.

The Third Prairie Steppe, or Lignite Tertiary Plateau, is bounded on the east by the western boundary of the preceding one, and includes the remainder of the great plain south of Lac la Biche. Wood Mountain and the Cypress Hills are both on this plateau, and deserve the name of hills, the latter even that of "mountain," as the western part attains an elevation of 4,000 feet above the sea, or 2,000 feet above the plain to the north. This section of the country is more broken than the others, and large tracts are better suited for pasturage than for the plough. Salt lakes and ponds, rolling hills, alkaline flats, deep ravines called *coulées*, and rivers flowing in deep channels, are the leading features of the district. Cactus flats, hills of pure sand, and large areas of excellent agricultural lands will attract the attention of different observers, so that varied and conflicting accounts are being and have been given of it.

Leaving out the areas covered with gravel, or which consist principally of drifting sand, the remaining level country will sooner or later become farming lands, and the broken country pasturage. It is within this area that all, or nearly all, the coal exposures noticed in this book are to be found, and as a rule at no great distance from the surface. Ninety per cent. then of the first two areas consists of excellent soil. On the third steppe are areas such as the one south of Battleford, where 10,000 square miles of good land may be found in one block. Further investigation is required before the more southern part can be definitely described.

That part of the prairie lying west of Moose Mountain, and a line connecting it with the Touchwood Hills, may be said to be wholly without wood, between the Boundary and lat. 52° north. Wood Mountain and the Cypress Hills, together with the narrow river valleys, are the only exceptions. Although at present without wood or even a bush for more than one hundred miles at a stretch, yet the only cause of this absence of trees is the ever recurring fires which burn off the grass and shrubby plants almost every season. Permanent water in abundance is found where not a willow or poplar twig has been seen for years. Should a range or group of sand hills intervene, shrubbery and even trees are found amongst them, though the plain in the vicinity is without a single twig. It requires very little observation to detect the reason. All fires cease when they touch those hills. Theories regarding an insufficient rainfall, based on the absence of trees, are fallacious, as all grasses form a sward on every part of the southern prairie, except where the soils are either too sandy, or the opposite—Cretaceous clay. With these exceptions all the surface is covered with grass, though much of it is very short.

Passing north of lat. 52° west of the Touchwood Hills,

the traveller advancing from the south will notice first little tufts of willows nestling close to the north eastern corner of a little pond of clear water. Still advancing north, he will notice these clumps becoming more common and occasionally showing stems two or three years old; these are soon followed by little poplars, and should a larger pond than usual be seen, a small group is sure to cling to it. Having frequently passed from south to north on the great prairie, and never having seen any change in the mode of arrangement as above briefly described, I came to the conclusion that the prairie fires explain the absence of wood.

In the partially wooded region which lies north of the prairie, ponds are more frequent and often marshes abound. The soil is very rich, and as the newly *cleared* land produces longer grass, this section and the more northern forest belt along the Saskatchewan were called the "Fertile Belt" by Captain Palliser, and others, who merely reiterated his statements. The mixed forest and prairie extending from Rapid City westward, including the Pheasant, File, and Touchwood Hills, and the country north of lat. 52° and south of the North Saskatchewan is of this nature. All the surveyors who have located the lands in this mixed prairie and poplar belt complain of numerous ponds and marshes that retard their work and cause them to suffer much from wet clothes while "chaining" in the fall when the water is cold.

The broken *front* of prairie and forest land has no definite line either to the north or to the south. The wetter the land towards the south the farther the wood extends in that direction, and the drier towards the north the farther the prairie extends northward. Prairie then means a dry and generally level tract in the north; and the occurrence of wood towards the south implies an elevated region of ponds and lakelets, as the Turtle and Moose Mountains.

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Continuous forest extends from the south end of Lake Manitoba by the Riding, Duck, and Porcupine Mountains, and northwestward to Fort à la Corne, east of Prince Albert. It thence ascends more to the north and follows the height of land south of the Beaver River, and includes the whole valley of the Athabasca and its tributaries.

Lake Winnipeg, as may be seen by an examination of the map, is the lower part of a basin, of which the First Prairie Steppe was formerly a part. On the east it receives Winnipeg River, a large and turbulent stream, which discharges the Lake of the Woods and its accumulated waters. Farther to the north, Beren's River flows into the lake, and by means of this stream and the Severn, which flows north, the Hudson's Bay Company kept open a summer route independent of the more regular highway of Hayes River, usually spoken of as the Nelson River Route.

At its southern extremity Lake Winnipeg receives the Red River, which at the city of Winnipeg is 900 feet wide, and averages ten feet in depth. Winnipeg is at the confluence of the Red and Assiniboine Rivers, and from its situation must be a city of great importance in the future. The Red River rises in Northern Minnesota, and after forming the boundary of this State and Dakota, enters Manitoba at Emerson. Many people think that because Minnesota and Dakota are south of Manitoba they must necessarily be warmer, but a little reflection shows that the greater altitude more than compensates for the higher latitude. Manitoba is actually warmer, both in winter and summer, than either Northern Dakota or Minnesota.

In ascending the Assiniboine we have, in succession, the Souris and Qu'Appelle, both draining a very extensive region, which is nearly all prairie, and both flowing in deep narrow valleys through the Second Prairie Steppe. On the north side of the river we have the Little Saskatchewan and Bird Tail Creek, both taking their rise in the

Riding Mountain. Farther to the north, Shell River, a rapid stream rising in the Duck Mountain, enters from the east; about fifty miles above, the White Sand, which is really the main river, enters from the west.

On the west side of Lake Winnipeg another Little Saskatchewan is found, and this apparently insignificant stream drains an area of not less than 30,000 square miles. All surplus waters of Lakes Manitoba and Winnipegosis empty by it into Lake Winnipeg. What this means will be understood by simply enumerating the rivers that flow into Lakes Manitoba and Winnipegosis, and considering that the only outlet of these is by this Little Saskatchewan. The White Mud River enters the head of Lake Manitoba and drains much of the wet country crossed by the C. P. R. between Portage la Prairie and the "Big Plain." It is worthy of note that this river rises quite close to the Assiniboine and flows northeasterly. Mossy River discharges Lake Dauphin; Pine River and two others drain the eastern slopes of the Duck and Riding Mountains. Swan River, a large stream 300 feet wide, drains the Porcupine Mountain, and, greatest and last of all, the Red Deer River enters the head of Lake Winnipegosis, and with its tributaries drains the whole country as far west as the 106th meridian.

All the waters flowing into the great Saskatchewan come from the Third Prairie Steppe, except the Carrot River, which runs parallel with the Red Deer River and enters the Saskatchewan near Cumberland House. The main affluents all take their rise in the Rocky Mountains, and uniting on the plain become one mighty river. Thus the South Saskatchewan is formed by the union of St. Mary's, the Belly, the Bow, and another Red Deer River, which rises in the Rocky Mountains and joins the main stream about long. 110° west and lat. 51° north. Below this the river widens, and at the Elbow, near the source of the Qu'Appelle,

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is 1,848 feet wide and with a channel ten feet deep. The only streams which do not originate in the Mountains are Strong Current Creek and Maple Creek, the latter draining the west end of the Cypress Hills, while the former receives the waters of the eastern end. The chief tributaries of the North Saskatchewan are Battle River, which enters at Battleford, and the Brazeau, which it receives southwest of Edmonton.

The Mackenzie River drains an immense area, both east and west of the Rocky Mountains, and pours a mighty flood into the Arctic Sea. Its great southwestern branch—the Peace River—takes its rise on the west side of the mountains, and flows northwesterly along their western base to lat. 56°, where it receives the Finlay Branch, which drains a large area in the northeast of British Columbia. The united stream now turns east and, after a course of nearly seventy miles, emerges from the Rocky Mountains. It flows through the plateau east of the range, in a channel 1,000 feet below its level. Turning more to the north, it sweeps in majestic curves through a rich and fertile plain, which constantly diminishes in altitude as the river gets to the north and northeast. For 770 miles it flows through a most lovely and fertile region, receiving in its course many rivers, the most notable of which are the Smoky and Pine, which drain the district of country lying between the Peace and Athabasca. When the river leaves the mountains, its channel is under 500 yards in width, but before it enters Slave River, twenty-five miles north of Lake Athabasca, it is over 1,000 yards wide. A branch stream, named the "Quatre Fourches" River connects it with Lake Athabasca, and by this stream, in early summer, there is a steady flow of water into the lake, but in autumn this is changed, and the waters of the Lake flow into the river. The author found this to be the case in

August, 1875, when there was a strong current flowing from Lake to River.

Lake Athabasca is about 250 miles long, by some twenty-five in breadth, and receives the drainage of a very extensive region, which is almost wholly covered with forest. The Athabasca River, which enters the western end of the lake, takes its rise in the Rocky Mountains, close to the sources of the Columbia, and flows in a general northeast course, till it enters the Lake. In its course, it receives the Macleod, Pembina, and Lac la Biche Rivers from the south, while on the north it receives Little Slave River, which, after a course of fifty miles from Little Slave Lake, empties into it a little north of lat. 55°. Little Slave Lake is an extensive sheet of water lying nearly east and west, about seventy-five miles in length and five in average breadth. In lat. 57°, the Athabasca receives the Clearwater—a fine stream of pure water which comes from the elevated country east of Portage la Loche.

Lake Athabasca discharges its accumulated waters by Slave River which, twenty-five miles below, receives the Peace, and both, under the former name, discharge into the still larger basin of Great Slave Lake. At the efflux of this lake, the real Mackenzie commences. At Fort Simpson, in lat. 61° 50' north, it receives the Laird from the west, some of the branches of which have their rise close to the sources of the Finlay, far west of the Rocky Mountains. It is on the upper waters of the Liard, that the rich gold fields of northern British Columbia are located, where hundreds of miners are engaged every summer. After receiving the Liard, the mighty flood, increased in volume and power, flows on, without break or obstruction, to the Arctic Sea, a distance from Fort Simpson of 700 miles in a straight line. A little south of the Arctic Circle, Great Bear Lake River enters from the east. Here was Fort Franklin, where the Arctic explorers wintered. North

GENERAL GEOGRAPHY.

of the Arctic Circle is Fort Good Hope, the most northerly of the Hudson's Bay Company's posts in the North-West.

The Churchill and Nelson are the great Rivers of Hudson's Bay, and enter its southwestern extremity; the latter about lat. 57° , while the mouth of the other is more than a degree further to the north. The Churchill, under the name of the Beaver River, rises in the high lands, north of Fort Edmonton, and flows generally eastward to the meridian of Fort Carlton when it turns north and flows into Isle la Crosse Lake. This lake also receives the drainage of that extensive region lying northwesterly towards Portage la Loche. From this lake, under the name of English River, it flows easterly through a chain of beautiful lakes, connected by more or less rapid discharges, and often bordered by cliffs of Laurentian gniess. Before receiving the "Great River," which discharges the waters of Rein-deer Lake, it turns northeasterly, and, keeping the same general direction, enters Hudson's Bay nearly 100 miles farther north than the Nelson. Owing to the peculiar character of the region traversed by this river, its waters are quite clear, and in marked contrast with all the other western rivers. Before it receives the Little Churchill, it is one-third of a mile wide, but below that it widens out to nearly a mile. Nelson River discharges the surplus waters of Lake Winnipeg, and will be fully described in another place.

The Rocky Mountains are the only mountains of the North-West. It is true that groups of hills and so-called mountains are occasionally met with, but nearly all these are composed of gravel and sand, and with the exception of the Cypress Hills, are very slightly elevated above the plain. The Rockies cross the International Boundary about the 114th Meridian, and run northwesterly, being in lat. 56° north on the 122nd Meridian, and ten degrees farther north on the 131st Meridian. They form one continuous

chain, composed of a number of separate transverse ridges, between which the multitude of small streams that form the large rivers have their sources. The larger lateral valleys receive many of these small streams, and it is up these that the various passes are to be found. The Kootanie Pass to the south, in lat. $49^{\circ} 30'$ north is 6,000 feet above the sea. As we go northward, the passes get much lower, so that the Peace River Pass is only 2,000 feet above the sea, while the mountains decrease very little in altitude. Peace River and the Liard are the only rivers which break through the chain. These have their sources in a series of mountains farther to the west. The highest part of the chain in British America, is where the Fraser and the Columbia, running to the west, almost unite with the North Saskatchewan and Athabasca flowing to the east. Here Mounts Brown and Hooker rear themselves to the height of over 15,000 feet, and their glaciers are the sources of those mighty rivers which flow on the one hand to the Pacific and on the other to Hudson's Bay and the Arctic Sea.

CHAPTER II.

Physical Geography of Manitoba.

Its Situation and Boundaries—Area—General Characteristics—Red River Prairie—Pembina Mountain—Wet Country along its Base—Riding Mountain—View from its Summit—Dauphin Lake—Duck Mountain—Lake Winnipeg—Lakes Manitoba and Winnipegosis—South Western Manitoba—Turtle Mountain—Red River—Graphic Picture of the Prairie near Winnipeg—Fort Garry—Assiniboine River—Land on Assiniboine—Souris River—Snake Creek—Oak Lake—Vicinity Suited for Stock-farming—Sand Hills, at Snake Creek—Little Saskatchewan—Land on Little Saskatchewan—Settlements in its Valley—Shoal Lake—Bird Tail Creek—Surrounding Country—Shell River—Country North to Fort Pelly—Indian Farm—General Character of Soil—A Desert changed to a Paradise—Timber for Building Purposes—Where Located—Building Stone—Brick Clays—Water Supply near Winnipeg.

THE eastern boundary of Manitoba is still undefined, but as originally formed, its limit was the 95th Meridian, which touches the Lake of the Woods. On the south, the International Boundary separates it from Minnesota and Dakota. Its western boundary is about $101^{\circ} 20'$ west long., and its northern, lat. 53° . Within these limits is comprised a total area of about 50,000 square miles, but that part of the country in the vicinity of Lakes Manitoba and Winnipegosis, is low and marshy.

Its general character is that of a level plain, sloping gently to the north, and becoming swampy as we approach the lake basins. The greater part is included in the First Prairie Steppe, defined in the preceding chapter. This includes Lakes Winnipeg, Manitoba, and Winnipegosis, and the low lying lands in their vicinity; that part of the Red River Valley, north of the International Boundary; and the Assiniboine Valley for twenty-five miles west of Portage la Prairie. The whole of this district was evidently at one time a lake basin, and the present rich soils are largely derived from the silts deposited

during a long series of years, when the present surface was under water. These rich alluviums have been the theme of many writers, and it is not necessary for me to enlarge on their fertility, or capacity for growing grain crops continuously. Suffice it to say that the cause of the poor water and alkaline soil in numerous localities, can be traced, in every instance, to the exceeding richness of the soil, and as long as it retains its *salts*, so long will it be noted for fertility.

The following extracts from the Report of Dr. George M. Dawson, Geologist and Naturalist to the British North American Boundary Commission, will be found of great interest, as giving an exact account of the region in question from the standpoint of a competent observer:—

“THE RED RIVER PRAIRIE.”

“Of the alluvial prairie of the Red River, much has already been said, and the uniform fertility of its soil cannot be exaggerated. The surface, for a depth of two to four feet, is a dark mould, composed of the same material as the subsoil, but mingled with much vegetable matter. Its dark color is, no doubt, in part due to the gradual accumulation of the charred grasses left by the prairie fires. The soil may be said to be ready for the plough, and in turning the tough thick prairie sod, the first year, a crop of potatoes may be put in, though it is not efficiently broken up till it has been subjected to a winter's frost. When the sod has rotted, the soil appears as a light friable mould easily worked, and most favorable for agriculture. The marly alluvium underlying the vegetable mould, would in most countries be considered a soil of the best quality, and the fertility of the ground may therefore be considered as practically inexhaustible.

“The area of this lowest prairie has been approximately stated as 6,900 square miles, but of this the whole is not

at present suited to agriculture. Small swamps are scattered pretty uniformly over its surface, and in some places very large areas of swampy land occur, as will be seen on reference to the large map of Manitoba, lately published by the Government. The greater part of these swamps are, however, so situated as to be easily drained, either into the Red River or some of its tributaries, which are usually depressed thirty or forty feet below the level of the surface. At present, the swamps in the vicinity of the settlements are made to yield supplies of natural hay; and until hay-grass is sown and regularly cultivated, the "hay-swamps" will continue to be a necessary part of the economy of the settler. The wide overflow of these swamps in the spring, when the season is wet, or when the dissolution of the winter's snow takes place very rapidly, is shown by the large area often found to be strewn with the dead shells of fresh-water molluscs, chiefly of the genus *Limnaea*.

"As a measure of the possible agricultural capacity of this great valley, take one-half of the entire area, or 3,400 square miles, equalling 2,176,000 acres, and, for simplicity of calculation, let it be supposed to be sown entirely in wheat. Then, at the rate of seventeen bushels per acre—which, according to Prof. Thomas, is the average yield for Minnesota—the crop of the Red River Valley would amount to 40,992,000 bushels.

"The wooded area of this lowest Prairie Steppe is quite small. The Red River and its tributaries are fringed with trees, of which Oak (*Quercus macrocarpa*, var.), Elm (*Ulmus Americana*), Poplar (*Populus tremuloides*, et *balsamifera*), and Ashleaved Maple (*Negundo aceroides*), are the most abundant. In some places the trees attain a large size, and the Oak woods bordering many of the streams are especially beautiful. Much of the best timber has, however, already been culled out, and it is yearly decreasing, without any systematic attempt for its preservation. The steamers running

on the Red River are among the largest consumers. Away from the immediate borders of the streams, the prairie, though covered with luxuriant sod, is absolutely treeless. It is fortunately the case, however, that the Red River valley is bordered on the east by the forests already described, and on the west by the wooded district of Pembina Mountain and its northern extensions."

The Pembina Mountain is *par excellence* the ancient beach in the valley of Lake Winnipeg. Dr. Owen describes it as it occurs a few miles south of the 49th Parallel. "After a hot and fatiguing ride over the plains, we arrived an hour after sunset at the foot of the Pembina Mountain. In the twilight, as we stood at our encampment on the plain, it looked as if it might be 800 feet or more in height; but in the morning, by broad daylight, it seemed less. When I came to measure it, I was somewhat surprised that it did not exceed 210 feet. I observed on this as on many other occasions, that a hill rising out of a level plain, appears higher than it really is, especially when, as in this case, the trees on its flank and summit are of small growth. Pembina Mountain is, in fact, no mountain at all, nor yet a hill. It is a terrace of a table-land, the ancient shore of a great body of water, that once filled the whole of the Red River Valley. On its summit it is quite level and extends so, for about five miles westward, to another terrace, the summit of which, I was told, is level with the great Buffalo Plains, that stretch away toward the Missouri, the hunting grounds of the Sioux and the Half-breed population of Red River.

"Instead of being composed of ledges of rock, as I was led to suppose, it is a mass of incoherent sand, gravel, and shingle so entirely destitute of cement that with the hand alone a hole several feet deep may be excavated in a few minutes. The Pembina River has cut through this material a deep narrow valley, but little elevated above the adjacent plain." Fifteen miles north of the Boundary Line, the

escarpment rises by four distinct terraces one over the other, three of which are from twenty to twenty-five feet high. Beyond this there is a gradual ascent of two miles, covered more or less with boulders, before the level of the next plateau is reached. It runs northwesterly from a point about thirty miles west of Red River, and merges into the Riding Mountain, west of the head of Lake Manitoba. In front of this broken escarpment, there are numerous marshes and pools of water which, north of the Assiniboine, prevent settlement for long distances. In rear, or to the west of this marshy tract, sand hills and sandy slopes rise one over the other, until the level of the plateau is attained. This plateau is the Second Prairie Steppe.

Riding Mountain rises from the lower plain at its southeastern termination by three successive steppes, each one separated from the other by a gently sloping plateau. The greater part of the mountain is densely covered with forest. On the ridges the soil is dry and gravelly and precisely like that of Pembina Mountain.

High above the Pembina Mountain the steppes and plateaux of the Riding and Duck Mountains rise in well defined succession. On the southern and western slopes of these ranges the terraces are distinctly defined; on the northeast and north sides they present a precipitous escarpment which is elevated fully 1,000 feet above Lake Winnipeg, or more than 1,600 feet above the sea.

Standing on the edge of the escarpment of the Riding Mountain and looking in the direction of Dauphin Lake, a gulf, two or three miles wide, and some two hundred and fifty feet deep, is succeeded by two ranges, one lower than the other, of cone-shaped hills covered with boulders. The hills are parallel to the general trend of the escarpment. In some places they are lost on the plateaux on which they rest, in others they stand out as bold eminences, showing the extent of denudation which gave rise to them.

These ranges of conical hills correspond with terraces on the west side of the mountain.

Dauphin Lake, lying at the base of the Riding Mountain, is about 750 feet above sea level. It is twenty-one miles long, and twelve miles in breadth. It receives several streams which rise in the Duck and Riding Mountains and discharges its surplus waters into Lake Winnipegosis by Mossy River, a stream about 125 feet wide and averaging from five to seven feet in depth. This lake is altogether surrounded by marshes which are separated from one another by narrow ridges of dry ground.

Northeast of Dauphin Lake is Duck Mountain, a high range of table land similar in every respect to that of the Riding Mountain described above. To the west this range is cut off from the Porcupine Mountain by Swan River which flows in a wide valley between the two ranges. On the west the Assiniboine cuts it off from the great prairie so that it is almost isolated by these two rivers. The "Mountain," as you proceed from west to east, consists of a series of broken or gently swelling hills very slightly elevated above the plain. These hills are covered with brush, *brulé*, or forest and are extremely difficult to travel through owing to the tangled pea and other vines which constantly retard the footsteps. As the hills are penetrated the forest becomes denser, and before the eastern escarpment is reached, Poplar, Aspen, and Spruce of large size are very common. Standing on the edge of the escarpment, Lake Winnipegosis lies at your feet. From this point, over 1,000 feet above the Lake, the view is very fine. As a whole the hills may be considered as forest and the soil uncommonly fertile.

Lake Winnipeg receives the waters of numerous rivers, which drain in the aggregate an area of 400,000 square miles. The Saskatchewan is its most important tributary. The Lake, at its southern extremity receives the Red

iver, which, together with its important affluent, the Assiniboine, drains an area of extraordinary fertility and extent. In length Lake Winnipeg is about 300 miles, and in several places fifty miles broad. Lakes Manitoba and Winnipegosis together are nearly as long, and the broadest part of the first named is not less than thirty miles across. Nearly the whole country between Lake Winnipeg and its western rivals is occupied by smaller lakes, so that between the Duck and Riding Mountains and the western shore of Lake Winnipeg, one half of the country is permanently covered with water. These lakes are shallow, being seldom over sixty, and often for long distances under ten feet in depth.

As to the second Prairie Steppe along the Boundary, or what is now South-Western Manitoba, Dr. Dawson says, at page 287 of his report, "The extreme western margin of the Red River prairie in the vicinity of the Pembina Mountain, is diversified by groves of oak, which stretch out from their base, and would, no doubt, be much more extensively wooded but for the constant recurrence of prairie fires. The front of the escarpment, and its summit, forming the edge of the Second Prairie Steppe, are in some places thickly wooded, and always show extensive patches of timber. The forest covered area increases north-westward. In the vicinity of the Line, the woods owe their preservation to the protection against fires afforded by the broken nature of the edge of the escarpment, by the great valley of the Pembina River, and its systems of tributary coulees, and to the frequent occurrence of patches of swamp. Poplar is probably the most abundant tree, though, even after ascending the escarpment, groves of oak are found. The wooded region has, however, in all localities suffered much from local fires; most of the trees at present living are small, while traces of a former heavy forest growth frequently appear.

"In some places pretty extensive prairie areas occur between Pembina Escarpment and Pembina River, and with the exception of a few localities, near the edge of the escarpment, where the Cretaceous Clays are near the surface, the soil is of excellent quality, and differs from that of the Red River Valley by the addition of a considerable proportion of sandy material. Swamps are here pretty thickly scattered, and some of them attain large dimensions in spring. Those parts of them which are permanently wet, however, bear luxuriant crops of natural hay-grass, and the general aspect of this region is favorable.

"On crossing the Pembina River the eastern margin of the great treeless plain is entered. No woods now appear, except those forming narrow belts along the valleys of the streams, and soon even the smaller bushes become rare. The shrubs met with are generally stunted, from the absence of shelter against wind, and the frequent passage of prairie fires. The little thickets consist, according to situation, of dwarfish snow-berry (*Symphoricarpos occidentalis*), *Spiræa*, roses and willows, fringing the small swamps and pools. The metallic-leaved silver-berry (*Elæagnus argentea*), comparatively rare in the Red River Valley, now begins to occur in abundance on the drier areas. In the last week of May, 1874, the common flowering plants on this eastern part of the First Prairie Steppe, were: *Viola cucullata*, *V. pedata*, *Ranunculus rhomboideus*, *Anemone patens*, then going to seed, and the whole prairie covered with its brownish woolly heads; *Geum triflorum*, found most abundantly near the edge of the escarpment, less common westward; *Astragalus caryocarpus*, becoming rapidly more abundant westward, *Antennaria plantaginifolia*, *Lithospermum canescens*, first blossoms.

"The undulating character of the prairie between Pembina Escarpment and Turtle Mountain, and the occasional occurrence of stony and gravelly hillocks, has received

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mention in the chapters on the drift. With reference to the soil, west of Pembina River, nearly the same remarks apply as to that east of it. It is fertile, though not so deep or inexhaustible as that of the Red River Valley, and rests on a gravelly, drift sub-soil. Swampy bottoms bearing a good growth of hay-grass abound, but their area is quite small as compared with that of the dry ground. Toward the end of the summer, most of these swamps dry up completely, and extensive regions are then without other water supply than that derived from the streams and rivers, which lie in deep valleys, and are often far apart. I do not think, however, that difficulty would be found in obtaining water by wells sunk in any of the lower parts of the prairie. The rainfall of this region is probably slightly less than that of the Red River Valley, but appears to be sufficient for agricultural purposes. It seems probable that at a period not very remote, a great part of this district was covered with forest trees. The humidity of the soil and climate is sufficient for their growth, and in some places little hummocks, resembling those formed in a forest, and known as "cradle hills," were observed. On approaching Turtle Mountain, the tendency of this part of the prairie to reclothe itself, is shown by the recurrence of thickets of seedling poplars on the sheltered sides of the undulations, wherever the fires have not passed for a few years. Between Pembina River and Turtle Mountain, and especially toward the latter place, the deep narrow paths, or ruts, made by the buffalo when travelling, are still quite apparent, though the animal has not been known so far east for many years. They have here a remarkably uniform northwest and northeast direction.

"The water of the swamps and ponds of this part of the prairie is generally sweet, but one distinctly saline lake was seen. It had not the thick fringe of grasses and sedges of the other ponds, and here, for the first time, the

Salicornea was met with in some abundance. There were also many dead shells of *Limnæa* and *Planorbis parvus*, but whether these molluscs lived in the saline water, or were washed thither from some neighboring swamp, I was unable to determine."

The Red River rises in Otter Tail Lake in the State of Minnesota, in lat. $46^{\circ} 24'$, and at first flows to the southwest, but in lat. $46^{\circ} 9'$ it turns to the north and shortly after enters on the great prairie, through which it cuts its tortuous course, without a break, to its entrance into Lake Winnipeg in lat. $50^{\circ} 20'$. To get a proper idea of the Red River in Manitoba it is merely necessary to imagine a stream from 300 to 600 feet wide, with a moderate current, which has in the course of ages excavated a winding trench or canal to the depth of from thirty to forty feet, in a tenacious clay, through a nearly level country, for a distance exceeding one hundred miles. As the river winds through the plain it forms peninsulas of varying size, and these are generally covered with heavy forest. This remark applies only to that portion of the river from twenty miles south of Winnipeg to Emerson.

As the primitive features of the Red River prairie are fast disappearing, and towns and villages springing up in every part, the following extract from the pen of Prof. Hind will be read with interest, as it is a typical description of what can be seen, in part, on the great prairies beyond the settlements at the present time. The scene is laid close to Winnipeg. "Here stretching away, until lost in the western horizon, the belts of wood on the Assiniboine rise above the general level, while from the Assiniboine towards the north again is an uninterrupted expanse of long waving prairie grass dotted with herds of cattle, and in the fall of the year with immense stacks of hay. This is the ordinary aspect of the country, comprising that portion of Red River settlement which lies between Mil.

Creek and Fort Garry. Remove the farm houses and churches, replacing them on the river banks by forest trees of the largest growth, and the country between Fort Garry and the 49th Parallel, as seen along the road to Pembina, a distance of seventy miles, is continually reproduced in its ordinary aspect of sameness, immensity, and unclaimed endowments.

"But it must be seen in its extraordinary aspects before it can be rightly valued and understood, in reference to its future occupation by an energetic and civilized race, able to improve its vast capabilities and appreciate its boundless beauties. It must be seen at sunrise, when the vast plain suddenly flashes with rose-colored light, as the rays of the sun sparkle in the dew on the long rich grass, gently stirred by the unfailing morning breeze. It must be seen at noon-day, when refraction swells into the forms of distant hill ranges the ancient beaches and ridges of Lake Winnipeg, which mark its former extension; when each willow bush is magnified into a grove, each far distant clump of aspens, not seen before, into wide forests, and the outline of wooded river banks, far beyond unassisted vision, rise into view. It must be seen at sunset, when just as the ball of fire is dipping below the horizon, he throws a flood of red light, indescribably magnificent upon the illimitable waving green, the colors blending and separating with the gentle roll of the long grass, seemingly magnified toward the horizon into the distant heaving swell of a parti-colored sea. It must be seen too by moonlight, when the summits of the low green grass waves are tipped with silver, and the stars in the west suddenly disappear as they touch the earth. Finally it must be seen at night, when the distant prairies are in a blaze, thirty, fifty, or seventy miles away; when the fire reaches clumps of aspen, and the forked tips of the flames, magnified by refraction, flash and quiver in the horizon, and the reflected light from rolling clouds of smoke above tell of the havoc which is raging below.

"These are some of the scenes which must be witnessed and felt before the mind forms a true conception of these prairie wastes, in the unrelieved immensity which belongs to them, in common with all the ocean, but which, the everchanging and unstable sea, seems to offer a bountiful recompense, in a secure though distant home, to millions of our fellow men."

Fort Garry is situated a few hundred yards west of the confluence of the Assiniboine and Red Rivers. A bridge has been built across the former at this point. Common report makes the river nearly double the width now that it was forty or fifty years ago. At present the breadth is over two hundred feet and this it preserves up to the mouth of the Souris where it is 230 feet wide. Above this point the river decreases in width but increases in depth, and after "the Rapids" are passed, seven miles below Brandon, no other obstructions are met with until we pass Fort Ellice. At this point the river is still 135 feet wide, and for nearly 100 miles, by land, north of this to the mouth of the White Sand River, its breadth and depth change very little. Fifteen miles above Fort Ellice are the Marquette Rapids which are caused by sand-bars and gravel. The Assiniboine rises in about lat. $52^{\circ} 20'$ and long. $103^{\circ} 15'$ west, and runs southeasterly to the great southern bend, thirty-five miles west of Brandon, where it changes its direction nearly east and joins the Red River in lat. $49^{\circ} 54'$. The country on both sides of the Assiniboine, for thirty miles west of Winnipeg, is of the same general character as that of the Red River, except that there is much more wood in the vicinity of the Assiniboine, especially on the south. The soil is of the best quality, but owing to the unbroken uniformity of the surface it is very wet in many places, and in a few, as at Baie St. Paul, subject to overflow from the river. Twenty miles west of Portage la Prairie the banks increase in height, the country be-

comes more elevated and sandy and we enter on the Second Prairie Steppe and soon after reach the mouth of the Souris.

This stream rises near the Squirrel Hills, up north of the great Souris Plain, very near the line of the C. P. R., and joins the southern branch of the river coming from the Coteau. Keeping a southeasterly course it crosses the International Boundary into Dakota about the 102nd Meridian and flows southeasterly to about lat. $48^{\circ} 10'$, when it turns again to the north and enters Manitoba east of the 101st Meridian. Its course is now northeast through a level plain supposed formerly to be of no value but now considered the garden of the southwest. North of this the Sand Hills are entered.

Plum or Snake Creek discharges Oak Lake, a sheet of water several miles broad, which during the summer is the abode of numerous water-fowl of many species. The land around this lake is very rich but much of it is low and marshy, producing enormous crops of hay, and from the presence of timber the whole tract is well suited for stock-farming on a large scale.

The low hills about Snake Creek are sand dunes, and on their sides is a lovely Cactus (*Mamillaria vivipara*), which is quite common in many other localities where sand predominates. The prairie on both sides of the Souris is treeless, but there is a thin belt of wood, more or less broken, along Snake Creek.

The Souris at its mouth is 125 feet wide and about three feet deep. Further up stream it becomes deeper, and although it is obstructed by rapids near its mouth, report says it is navigable as far south as the Boundary.

The Little Saskatchewan rises in the Riding Mountains and for over a hundred miles flows through a rich and generally fertile country. The flanks of the Riding Mountain are cut up with numerous rivulets. These joining form the Bird Tail Creek and Little Saskatchewan. The latter



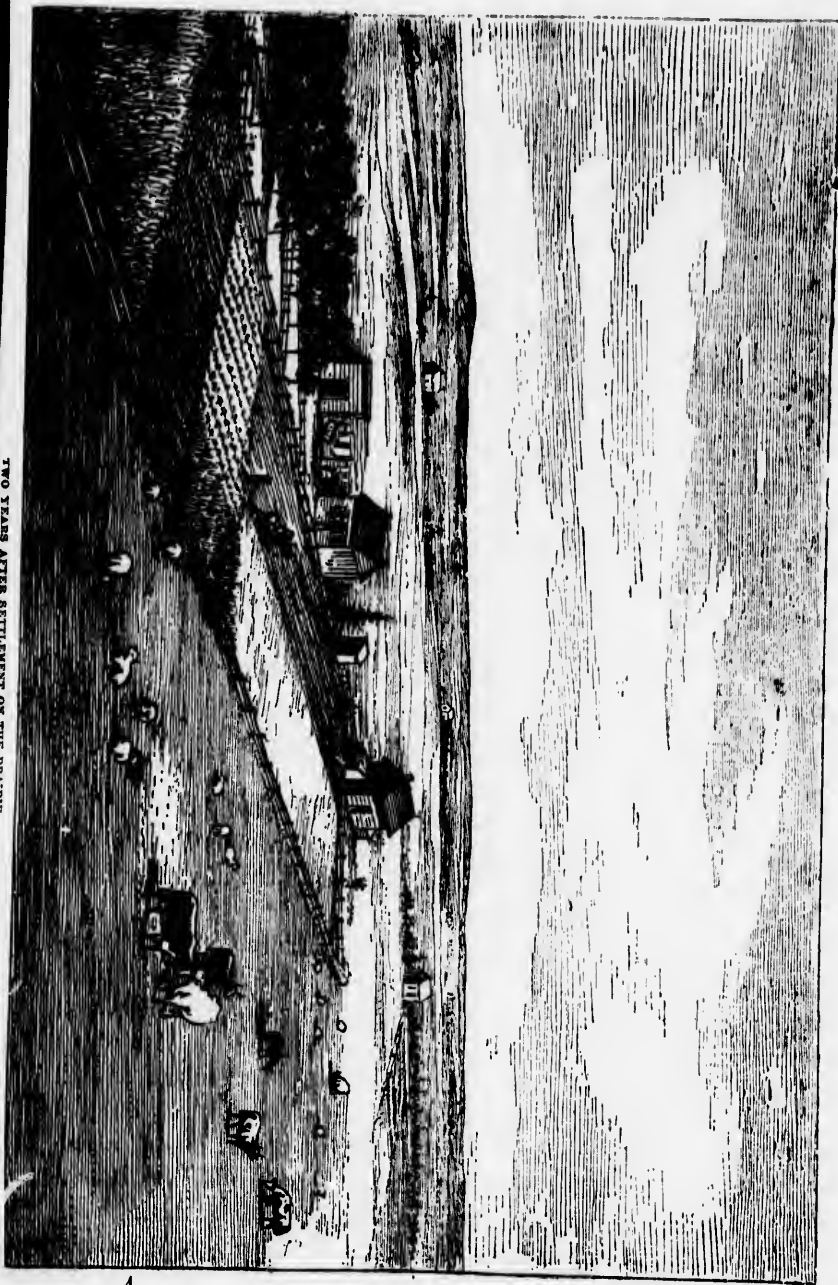
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FIRST YEAR IN THE BUSH.

TWO YEARS AFTER SETTLEMENT ON THE PRAIRIE.



stream issues from the forest through an excavated valley filled with balsam poplar, and an undergrowth of choke-cherry, dogwood, and cranberry, with thickets of roses, raspberry bushes, wild peas, vetches, convolvuli (*Calystegia sepium*), and wild hops. For the greater part of its course this is the character of the valley, but below Minnedosa and Odanah wood is not so abundant as higher up. All the district drained by this stream is generally fertile but much broken by ponds and hay marshes; these, however, can be easily drained in most cases, and lands now rejected from this cause will be sought for in the future. Ponds and lakes are numerous; wild fowl in great numbers visit them every spring and fall, and the river itself abounds in fish of which great numbers are caught in the spring. The waters of the river are beautifully clear and of sufficient depth to float down logs from the Riding Mountains, for the use of the settlers on its banks or the country on either hand. The rising towns of Rapid City, Minnedosa, and Odanah have been located in this valley and the country around is fast filling up with an intelligent and generally well-to-do class of settlers.

Between the Little Saskatchewan and Bird Tail Creek, on the west, is an extensive tract of very excellent land in the midst of which is Shoal Lake, described by a writer in a recent publication as follows:—

"Shoal Lake is distant about one hundred and seventy-five miles from the city of Winnipeg. On reaching it, the eye of the traveller is suddenly caught with the view of a magnificent sheet of pure, crystal-like water stretching away to his right some four miles, surrounded by gravelly and sandy shores, and fringed here and there with thick belts of timber, mostly poplar. This is said to be only one of a succession of beautiful lakes stretching from the Riding Mountains, some twenty-five miles to the north, to the Assiniboine River about thirty miles to the south. In spring and autumn

especially, myriads of wild fowl are to be seen popping over the surface of these waters, which also abound with fish. All of this, in connection with deer hunting (which can be had within easy distance), affords excellent pastime for the sportsman. The advantages for settlement, particularly for stock-raising, although the excellence of the soil for agricultural purposes cannot be doubted, are not only numerous, but strongly inviting. The picturesque and undulating country for many miles around, thickly dotted with bluffs of poplar, with occasional large marshes intervening, afford abundance of both fuel and hay for the settler. There is also a Post-Office and mail station, established here in connection with the mail line between Winnipeg and Edmonton. It is also a station of the Mounted Police, and will no doubt become very soon a place of some importance. The large increasing immigration continually moving westward, will create an excellent market at this point."

Bird Tail Creek, a fine stream of pure water, takes its rise in the western part of the Riding Mountain, and enters the Assiniboine some distance east of Fort Ellice. This stream passes through a very rich section of country, which is far less broken with ponds and marshes than the tract along the Little Saskatchewan. In its northern part, it is almost all forest, but after the stream leaves the "Mountain," the country becomes more diversified, and prairie and aspen bluffs give it a park-like appearance. The village or town of Birtle is situated on the creek, twelve miles east of Fort Ellice, in the midst of a very rich section, and at present surrounded by fine farms, though the first house was erected in the settlement in 1879.

Between Bird Tail Creek and Shell River, in a north-westerly direction, is a magnificent tract of country where a few settlers have gone in, but where there is room for thousands. The land is of the very best quality, and there is abundance of wood and water.

"From Shell River to within ten miles of Fort Pelly, on the left bank of the Assiniboine, is a tract of country unsurpassed for beauty of situation and richness of soil in the North-West. Issuing from the Duck Mountain, are numerous streams, which meander through a beautiful and fertile country. This area may be said to commence at Two Creeks ten miles from Fort Pelly, thence on to Pine Creek, fifteen miles further. The vegetation is everywhere luxuriant and beautiful from the great abundance of rosebushes, vetches, and gaudy wild flowers of many species. After passing Pine Creek, the trail to Shell River pursues a circuitous route through a country of equal richness and fertility. Shell River is forty-two miles from Pine Creek, and in its valley small oak appears, with balsam poplar and aspen, covering a thick undergrowth of raspberry, currant, roses, and dogwood."

Numerous settlers are located in the Shell River country, and all express themselves highly pleased with it. During the past summer the writer examined the Indian Farm north of Pine Creek and obtained samples of wheat so fine that they were the wonder of all beholders. About one hundred days ripen wheat in this region, which is between lat. 51° and 52°.

The general character of the soil in Manitoba, west of the Pembina Mountain, is a rich sandy loam, often varying to a very rich black loam, and at other times passing into sand as the Souris is approached. In no section of this district is frost injurious, as the land is generally dry and the soil warm. On the Souris Plain, both east and west of Turtle Mountain, the early explorers found short grass and little water and called it a desert. Practical men break up the dry and apparently sandy soil and produce crops that astonish the world. To-day South-Western Manitoba is called the garden of the Province; five years since it was supposed to be a barren, irreclaimable waste.

North of the Assiniboine the surface is more broken in many places, the soil is deeper and richer, wood is more abundant, but late-sowed grain is in danger of frost in unsheltered situations; water is abundant and good, and every requisite for successful settlement is at hand. There is no part of Manitoba where an immigrant cannot find good land, but it is advisable at this early stage of settlement, when land is abundant, to keep clear of wet lands, as drainage at present in most localities on the lower plain is out of the question.

Abundance of timber for building purposes can be obtained on the Riding and Duck Mountains. At present it is floated down the Little Saskatchewan to Rapid City, down Bird Tail Creek to Birtle, where it is sawn into lumber for the use of settlers. On Shell River, in the Duck Mountains, there are fine groves of spruce, from which large numbers of logs were cut and floated down to Brandon last year. Around Lakes Manitoba and Winnipegosis there are quantities of spruce of large dimensions, which up to the present remain untouched, except on the Fairford River, at the outlet of Lake Manitoba, where Mr. Pratt, who owns the saw mill at Totogon, obtains his logs.

Fine groves of elm, ash, maple (*Negundo aceroides*), balsam poplar, with occasional spruce and tamarac, are still to be found in the Assiniboine Valley, and outside of the river flats there are large quantities of fine aspen in many places. Although there exists areas where wood of any kind is scarce, still it is a mistaken notion that there is a general scarcity of wood in Manitoba.

Stony Mountain, as its name implies, is largely composed of rock. It is a whitish limestone, lying in horizontal beds of varying thickness, very easily worked and said to be uninjured by frost. As the quarries are only about six miles from Winnipeg, it is of inestimable value to that city. About twenty-five miles above Portage la Prairie, on the

Assiniboine River, there is a fine outcrop of limestone of another variety, which will be easily worked and ought to be a source of supply for Portage la Prairie and possibly Brandon. A few other localities where rock is exposed have been noted, but up to the present no action has been taken regarding them.

Up to 1873 no brick clay was supposed to exist in the country, but since that year knowledge in this line has so increased that practical brickmakers now say that Winnipeg bricks are unsurpassed in any country for hardness and durability. As towns increase, brick clays will be found without difficulty, and each locality will produce its own brick as the variety worked at Winnipeg is known to exist in other parts of the province.

One difficulty, which has been a serious one in the past, has about disappeared, that is, the power to get good sweet water in Winnipeg and its neighborhood. At first all wells sunk into the clay invariably gave brackish water, and owing to this the supply for drinking purposes had to be drawn from Red River. Last season a number of wells were bored through the clay into a stratum of gravel below, and in every case good water was obtained. It is now a matter of certainty that excellent water exists in abundance under the clay, and when this is struck and the surface water kept out, pure water will be assured.

CHAPTER III.

Character of Country between lat. 49° and 50° west of Manitoba.

Description of Moose Mountain—Plain from its Top—West side of Moose Mountain—Timber on the Mountain—View from High Hill—Souris Plain—West of Moose Mountain—Character of Soil—of Vegetation—of Surface—Great Clay Plain—Its Rough Surface—Scarcity of Water—Wild Roses—A Visit to the Coteau—Cactus Plain—Wood in the Coteau—Description of Coteau—Resemblance to Turtle Mountain—Absence of Wood—Plateau of Lignite Tertiary—Wood Mountain—Disappearance of the Buffalo.

IN the preceding chapter we described that part of the Souris Plain lying east and south of Moose Mountain. This "Mountain" is part of an elevated group of drift hills that extend to the northwest, under the name of Weedy, Wolf, and Squirrel Hills. In the distance it presents the same appearance as Turtle Mountain, and forms a blue line on the horizon of considerable length. The distribution of wood upon these hills and their environs, presents an exact counterpart of that on Turtle Mountain. The east end of Moose Mountain rises into a somewhat conical peak 340 feet above the general level, and from it a wide view over the plain to the south and west is obtained. Far as the eye can reach stretches the naked plain, characterized a few short years ago as a barren desert, but now known to be of wonderful fertility. Like Turtle Mountain this group of hills is composed altogether of drift, and incloses numerous lakes of considerable size; these lakes are the sources of a few small streams, but in most instances they have no outlet, and in the autumn their water becomes brackish and unfit to drink.

Moose Mountain, as seen from the prairie on the east side, rises with a gentle slope and is flanked by marshes extending some miles to the east. Towards the south two or three rounded points are seen rising to a considerable elevation,

but when the base is reached nothing to be called a hill is visible. On a westerly course we travelled twenty-one miles along the hills, about three miles from the green timber. Having penetrated it nearly four miles, I am safe in stating that there are at least 100 square miles of good timber, nearly all balsam and aspen poplar. Occasionally a few small ash and ash-leaved maple appear, but these are of no value. There is abundance of water in the hills, nearly one-fourth of the surface being covered by it, but the greater part of it is brackish, being in isolated ponds like those in the Touchwood Hills. Whenever the ponds are connected by an outflow they are invariably good. The others are not, unless fed directly by springs. The whole country to the north of the continuous wood consists of ridges, ponds, lakelets, and hay marshes, with very little level land, but the soil is always good, even on the tops of the ridges, which show gravel on the surface. Pits were frequently dug and the black loam was never less than nine inches in depth. Often with pebbles on the surface first-class soil was found for a depth of eighteen inches.

From the top of the highest hill, at the northern end of the continuous green wood, a very extensive view of the whole country to the west and north was obtained. To the west the view was bounded by our powers of vision, while to the north numerous bluffs and ridges showed that some of the timber still remained, which had been seen by Palliser and Hind twenty years before.

Southwestward of this region lies the western part of the great Souris Plain, which to the old explorers was a howling wilderness destined to sterility, on account of its light rainfall, scarcity of water, and total absence of wood. This immense treeless expanse, extending from the Souris River, on the 101st Meridian, northwesterly to Moose Jaw Creek, in nearly the 106th Meridian, we crossed diagonally from Moose Mountain to the confluence of Moose Jaw and Thunder Creeks.

After leaving Moose Mountain, the country, for a few miles, is rather broken by occasional ponds of brackish water and ridges containing a large percentage of gravel. Proceeding westward, the country becomes more level, the soil better, but water scarcer; almost imperceptibly, the traveller enters upon a vast plain, extending to the west and south into the horizon, without a bush or mound to break its uniformity. At first, blue hills are seen to the north, but as days pass, these disappear, and that sense of utter loneliness comes irresistibly upon him, that travellers crossing the "Great Plains" of the United States have noted.

Numerous pits were dug into the soil each day, as we proceeded. As we passed west from Moose Mountain, the country became drier, the grass shorter, and the surface soil more difficult to penetrate. We never failed to find first-class soil, but about eight inches of it was almost entirely roots and often very hard and dry, but beneath this, at a depth of two feet, it was quite soft. Roots penetrated much beyond this depth. Fire passes over the country every year, and, in 1879, in many places, burned the life so completely out of the roots of the various grasses which have a tendency to grow in clumps, that the following year, scarcely a blade was seen. Although the grass is short the rainfall is quite sufficient, as there is abundance of fresh water ponds, and yet not a shrub over six inches high exists in the country. I speak of the region east of the Qu'Appelle trail, which we crossed in lat. 50° 03'.

Before crossing the Qu'Appelle trail, the character of the soil changed. Instead of being a black loam on the surface, of varying depth, with a light colored clay sub-soil, it became more homogeneous, and was generally a strong friable clay with scarcely any water on the surface, but covered with a crop of tall, rich-looking grass, which was remarkably green and fresh. The soil was precisely the same as that I had noted on the great plain, south of Battleford, in 1879. For

forty-five miles, we passed over a region which was almost a dead level, and yet so rough, throughout the greater part of it, that our carts were nearly shaken to pieces. Patches of skin were jerked off the necks of the horses, by the twisting caused by the hummocks and hollows. By digging pits into the soil, we ascertained the reason of this extraordinary roughness. Although the ground appeared hard and dry, it was not so. In reality, about eighteen inches of the surface was quite soft, and so easily penetrated, that almost without an effort, a spade could be thrust into it up to the head. Beneath this, however, the clay was very hard and dry. All the spring and summer, rain enters the soil quite easily, by means of the cracks surrounding each hummock. These are well described by Dr. Robert Bell, when speaking of another part of this region :—"The clayey ground, in this part of the country, is rendered hummocky and difficult to travel over by carts, owing to the fissures produced by drying, in former years. These fissures divide the ground into spaces, usually five-sided, from one to two yards in width. The edges of the fissures, by falling in, have gradually converted the intervening spaces into dome-shaped mounds, which are hard and unyielding. These principal hummocks are again divided by minor fissures of more recent date. This kind of surface extends alike over the flat-bottomed hollows and low-swellings hills." The moisture descends almost at once into the soil, by means of these cracks, and owing to the imperviousness of the clay, is retained near the surface, or just below where the soil is friable. The winter's frosts expand this moist soil, and instead of these cracks being caused by the sun, they are frost cracks, produced by the heaving of the soil. Clay taken out at a depth of two feet, was generally in little cubes, and it was between the crevices of these that roots penetrated to an unknown depth. With all our exertions, water was obtained on the surface only four times in crossing this forty-five miles, and yet the

whole air was odorous with roses which grow on bushes a few inches in height. The prevailing grass of the region was a species of wheat grass (*Triticum*), closely related to the quick, quick or couch grass of Ontario, a grass known to be sweet and nutritious.

Southwest of this tract, blue hills began to show themselves, but instead of water becoming more plentiful it became scarcer, and with our utmost exertions we could not obtain a drop, so that it was ultimately necessary to deviate from my instructions and proceed to the north. Before I was compelled to do this, however, I left the party encamped at a water pool, and with two others went thirty miles to the south to locate the blue hills seen in that direction. Ten miles over such a country as I have been describing, brought us to Moose Jaw Creek flowing to the northwest, with banks about ten feet in height, and breadth about twelve feet. The water was very muddy. After crossing it, we came upon another creek of pure sparkling water, which came from the Coteau and emptied into the first, a little to the west of our crossing. Nearly twenty miles over a perfectly level plain, which in places was covered with a profusion of cactus, brought us to the base of the Coteau, at a point near the Cactus Hills. The plain between the creek and the hills was principally Cretaceous clay, and occasional patches of it were without any vegetation, except that peculiar to arid soil. The ravines along the Coteau were filled with wood of small size. Ash, elm, maple, and poplar were the prominent species, but numerous shrubs were likewise seen. Along the creeks, willow clumps were common but no trees.

The lift from the plain to the top of the hills was about 400 feet, and seemed to be the "ruins of an escarpment," as the whole face consisted of a series of slides with the strata tilted at various angles. The plain crossed south of the

creek, appeared to be principally composed of the washings of the escarpment, and was nearly level with a very slight dip towards the creek.

Dr. Dawson, who carefully examined the Missouri Coteau, thus speaks of it: "One hundred and twenty miles west of Turtle Mountain, the second prairie plateau comes to an end against the foot of the great belt of drift deposits, known as the Missouri Coteau.

"The Missouri Coteau is one of the most important features of the western plains, and is certainly the most remarkable monument of the glacial period now existing there. Though frequently mentioned in western reports, I cannot learn that its structure has yet been carefully studied. I have had the opportunity of examining more or less closely that portion of it which crosses the forty-ninth parallel, for a length of 100 miles.

"Where cut somewhat obliquely by this parallel, the Coteau may be said to extend for a distance of forty-five miles. At right angles to its general course, however, its extreme width at this point cannot be more than thirty miles. On approaching it from the east, on the trail from Wood End, which, as already stated, is somewhat more elevated than the prairie lying east of it, a gradual ascent is made, till the edge of the Coteau is reached, amounting in a distance of twenty-five miles to about 150 feet. The country at the same time becomes more distinctly undulating—as on approaching Turtle Mountain from the east—till, almost before one is aware of the change, the road is winding among a confusion of abruptly rounded and tumultuous hills, which consist entirely of drift material, and in many cases seem to be formed almost altogether of boulders and gravel, the finer matter having been to a great extent washed down into the hollows. Where it appears, however, it is not unlike that of the drift of the lower prairies, being yellowish and sandy. Among the hills are basin-like valleys, round, or irregular in form,

and without outlet, which are sometimes dry but generally hold swamps or small lakes, which have frequently been filled in with material washed from the hills so as to become flatbottomed. The hills and valleys have in general no very determinate direction, but a slight tendency to arrangement in north and south lines was observable in some parts of this region. The hills culminate on the line about the 305th mile point, and westward from this point they are neither so steep nor so stony. The country gradually subsides from its rough and broken character, to that of rather boldly undulating prairie, without, however, falling much in general elevation below the tops of the bolder hills further east. We have, in fact, passed up over the margin of the third great prairie steppe.

"The whole of the Coteau belt is characterized by the absence of drainage valleys, and in consequence its pools and lakes are very often charged with salts, of which those most abundantly represented are sodic and magnesian sulphates. The saline lakes very generally dry up completely toward the end of the summer, and present wide expanses of white efflorescent crystals, which contrast in color with the crimson *Salicornea* with which they are often fringed. The crystalline crust generally rests on a thick stratum of soft black mud.

"The boulders and gravel of the Coteau were here observed to be chiefly of Laurentian origin, with, however, a good deal of the usual white limestone, and a slight admixture of quartzite drift. On the western margin some rather large disused stream valleys were seen, holding chains of saline lakes; but their relation to the drift materials of the Coteau were not so clearly shown as in other localities further north, to be described.

"In passing westward, from the last exposures of the tertiary rocks near Wood End, to the locality of their first appearance within the Coteau, a distance of about seventy

miles, we rise about 600 feet and attain an elevation of about 2,500 feet above the sea. The slope of the surface of the Lignite Tertiary then, assuming it to be uniform, is a little less than one hundred feet per mile; and on and against this gently inclined plane, the immense drift deposits of the Coteau hills are piled.

"Passing westward for about seventy miles, it is found to preserve much the same appearance. The prairie of the Coteau foot is rather undulating, and slightly raised above the general level, but the edge of the hilly country of the Coteau itself, is always from a distance well defined. To the northward and eastward, boundless level, treeless plains stretch to the horizon. The Traders' Road to Wood Mountain, after passing along the base of the Coteau for the distance above indicated, turns westward and crosses it, taking advantage of a deep bay in its edge, in which also rises a main tributary of the Souris River. The road then passes for about fifty miles through the Coteau belt, which must here be about thirty miles wide, and repeats almost exactly the physical features already described, though in this particular locality neither quite so tumultuous nor so stony as on the line.

"Following the Traders' Road westward for about twenty-five miles toward Wood Mountain, it passes for the most part between the southern edge of the Coteau proper, and the northern margin of the Tertiary plateau. Wherever from any hill, a view over the Coteau to the north can be obtained, it is seen to stretch away to the horizon in a succession of wave-like mounds and ridges, which do not differ much in average altitude.

"The intervening region, followed by the road on account of its facility, has characters of its own. Wide and deep valleys, often flat-bottomed, with systems of tributary coulées are found everywhere cut in the soft rocks of the foot of the Tertiary plateau. Some have small streams still flowing in

them, fed by the drainage of the plateau; but for the most part these old valleys are dry or occupied by chains of small saline lakes, the waters of many of which disappear early in the summer. The lakes usually have the long river-like forms of the valleys which contain them, and receive the waters of the brooks which still flow. One of the most important, probably nine miles in length, forms the drainage basin for the streams of Wood Mountain; its sides are abrupt and the water appears to be deep. These old valleys are evidently of pre-glacial age, and have formed a part of the original sculpture of the country. The heaping up of the great drift deposits of the Coteau along the foot of the Tertiary plateau, has blocked them up, and prevented the drainage finding its way northward as before. Since the elevation succeeding the glacial subsidence, the rainfall of the district has never been sufficiently great, in proportion to the evaporation, to enable the streams to cut through the barrier thus formed. The existence of these valleys, and the arrangements of the drift deposits in this region, have important bearings on several problems connected with its general history."

The Coteau resembles Turtle Mountain in its physical features and like that district would no doubt be thickly wooded but for the prairie fires, which have sometimes run hundreds of miles in the dry weather of autumn. As it is, the want of wood is one of the most serious drawbacks, and animals fed over these hills in summer would require to be wintered in some of the river valleys to the north, or in the wooded ravines of the Tertiary plateau to the south. The plateau of the Lignite Tertiary is for the most part adapted for pastoral purposes, and being covered with a good growth of grass, is well suited for this use. The strip of country between the plateau and the southern edge of the Coteau, partakes in some measure of its character, but has a less favorable appearance.

One important advantage of this plateau is the existence along its edges of sheltered ravines and valleys, containing groves of poplars. Another is the presence beneath it of vast deposits of lignite coal. In one of these sheltered valleys the Half-breed settlement known as Wood Mountain is situated. Here there has been stationed for a number of years a large detachment of the Mounted Police, and here too Sitting Bull made his headquarters after the slaughter of the American soldiers under Custer. In past time Wood Mountain was a noted locality, as the buffalo roamed in countless thousands over the wide prairies on every hand, and the hunters had only to kill and eat, as game abounded. All this is changed, and now buffalo are becoming so scarce that in the vicinity of Wood Mountain they scarcely ever appear.

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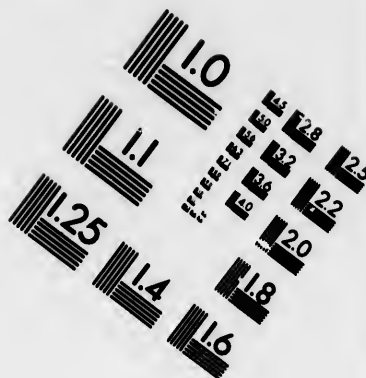
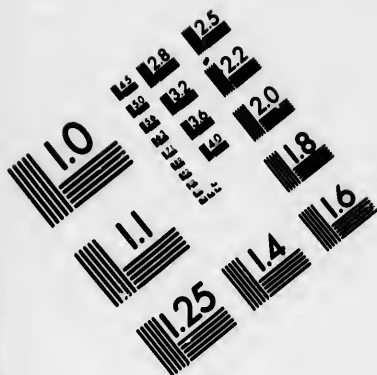
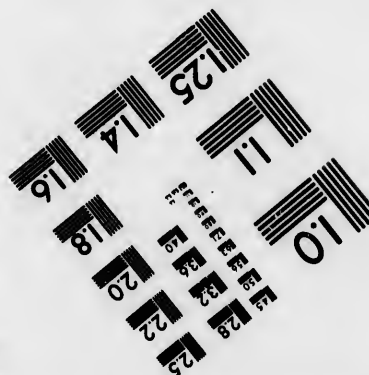
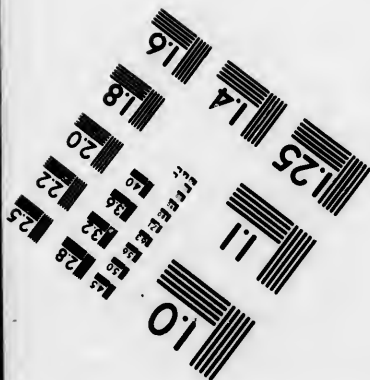
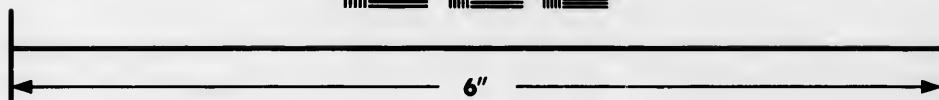
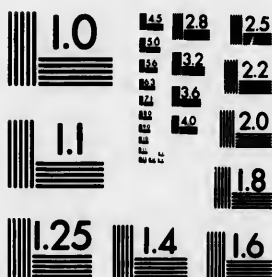


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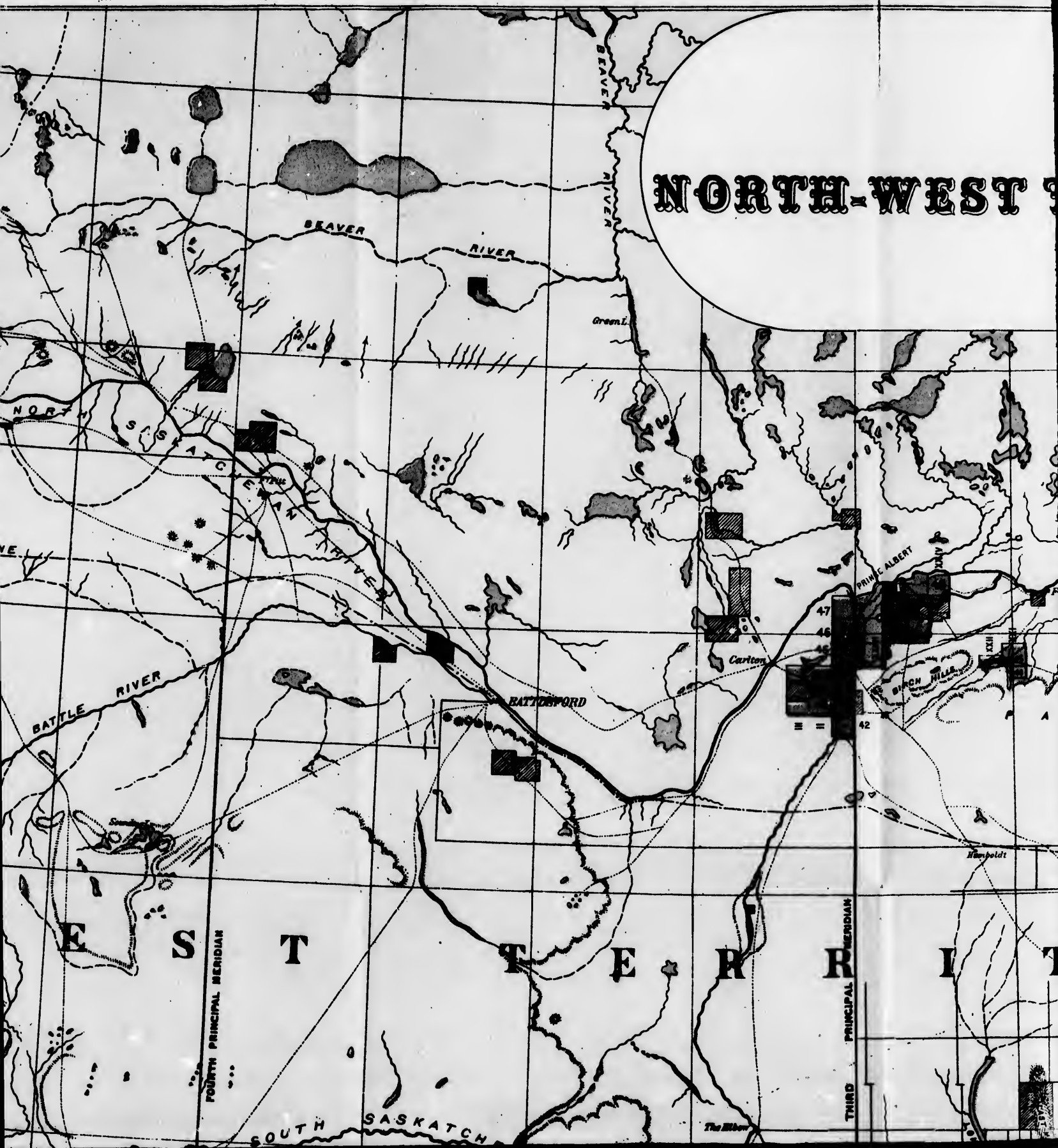
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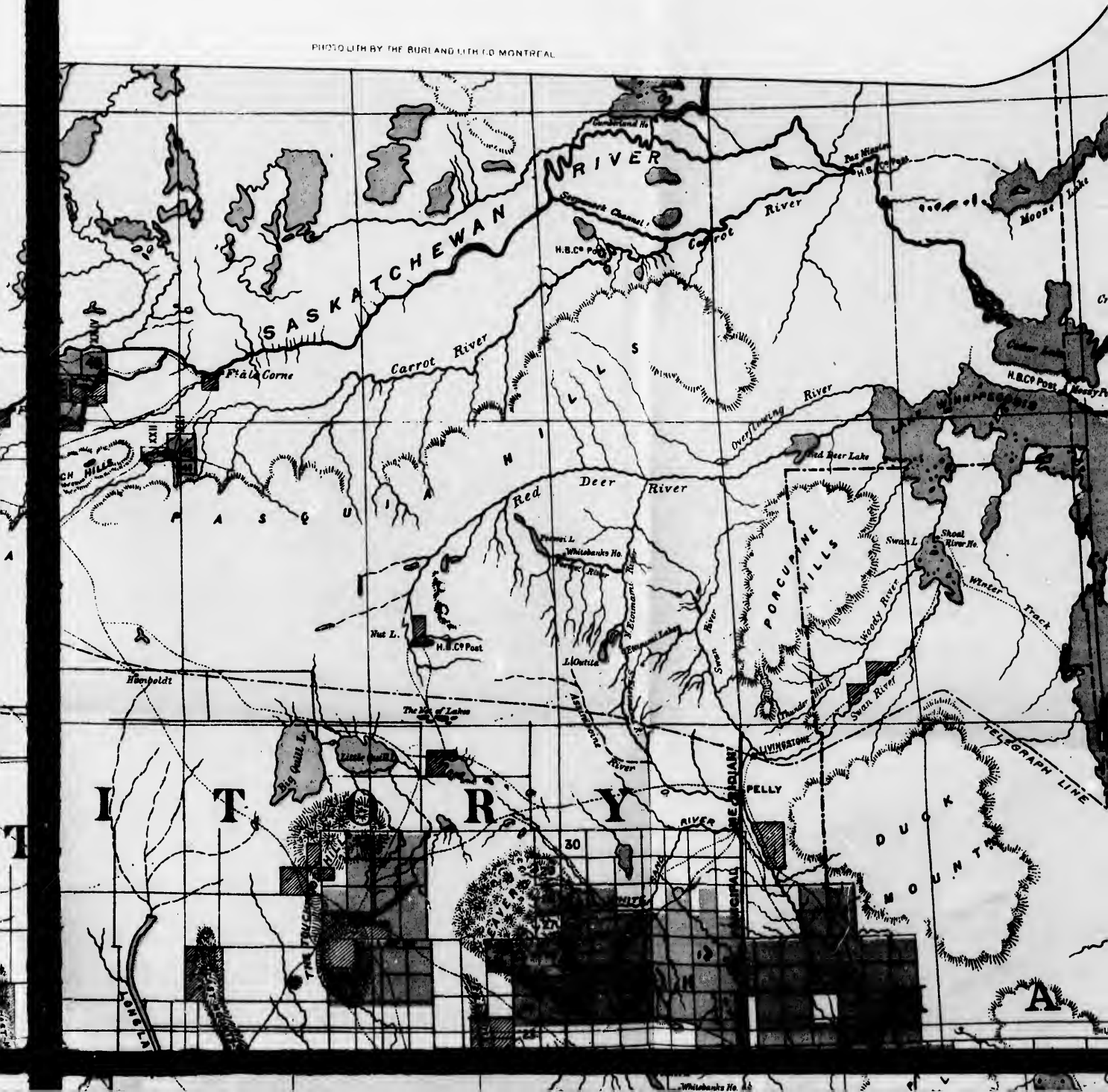


GENERAL MAP

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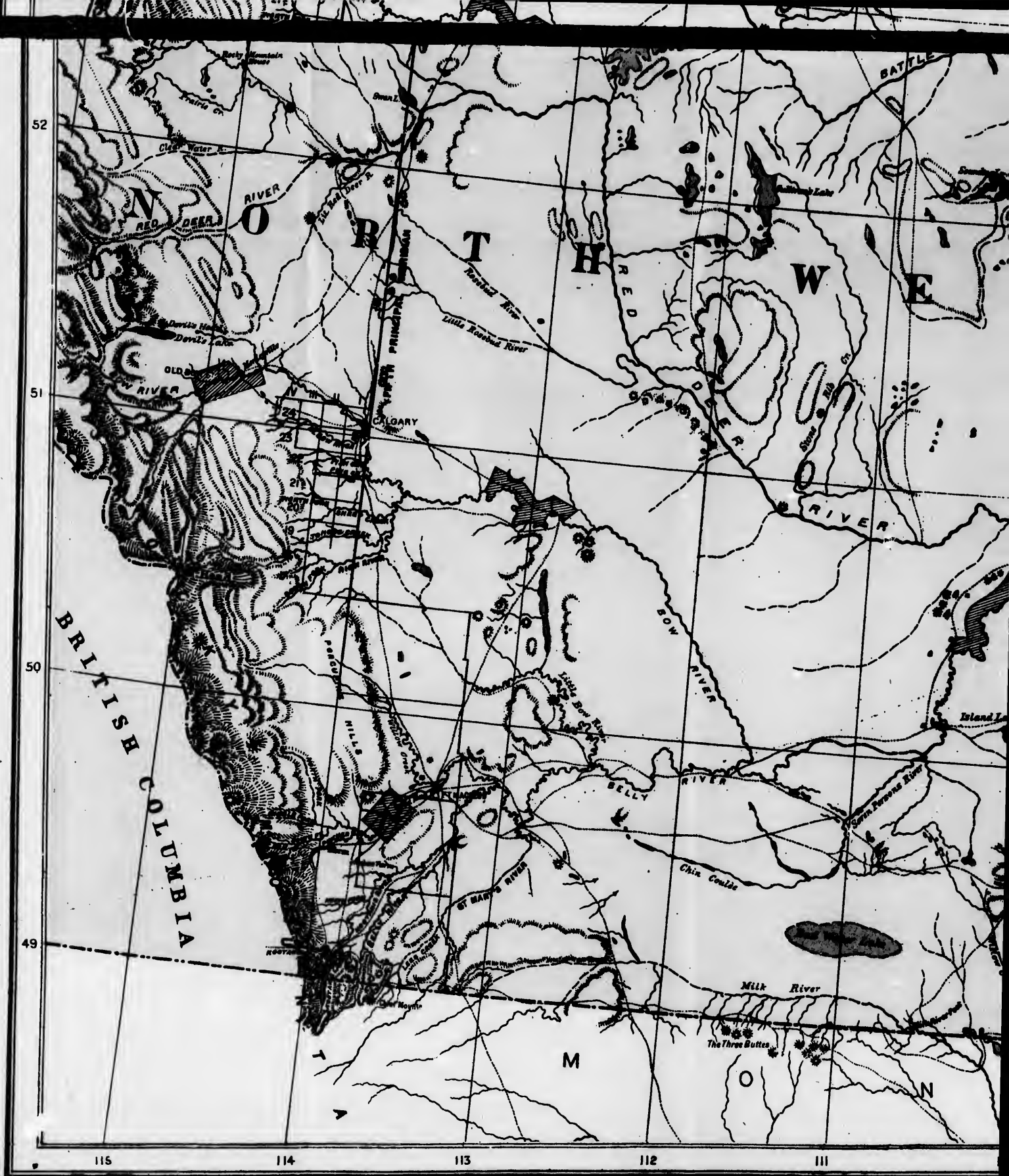
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CHAPTER IV.

Character of Country between lat. 50° and 51° West of Manitoba.

Assiniboine below Brandon—Brandon—Assiniboine Rapid—Land near Brandon—Brandon Hills—Land along the C.P.R.—Flat Creek—Gopher Creek—Land West of Gopher Creek—Pipestone Creek—Weedy and Wolf Hills—Rich Country along the C. P. R.—Qu'Appelle River—Navigation of the Qu'Appelle—Country North of the Qu'Appelle—Pheasant Plain, Leach Lake—Very rich Land in this Region—Long Lake—Fish in Long Lake—Waterfowl—Creeks at the Head of Long Lake—Country West of 102nd Meridian—Wood for House building and other Purposes—Country West of Touchwood Hills—Estimate of good Land in Qu'Appelle Valley—Unequalled tract for Wheat—Early Ripening of Grain—Absence of Summer Frosts—Early Spring—Moose Jaw Creek—Dry Country in its Vicinity—Sand Hills West of it—The Coteau—Old Wives Lakes—Country West of Lakes—Excellent Pastures—Nutritious Grasses—Their Distribution—Sage Brush and Cactus no Proof of Aridity—Bullrush Lake—Strong Current Creek—Want of Wood—High broken Country—Appearance of Cypress Hills.

THE traveller ascending the Assiniboine finds that, after passing the mouth of the Souris, the eroding power of the river ceases; its width sensibly diminishes and its tortuousness increases, while the banks become so low that from the hurricane deck of a steamer an extensive view, especially to the south and southwest, can be obtained. Owing to the crookedness of the river the ascent is slowly made, and an intelligent observer does not fail to notice that this is the reason that boats can ascend the river, for were it less crooked, and its waters not thus backed up, no boat could ascend the stream.

The "Rapid," situated about eight miles above the mouth of the Souris, is caused by a ridge of boulders which here crosses the river, and which can be seen as a gravel and boulder ridge, extending back from the river on both sides. On the south side this line of boulders seems to extend in the direction of the "Hills of Brandon."

The point on the Assiniboine which is now called Brandon, but formerly the "Grand Valley," was well named. The river banks at this point are very low, but some dis-

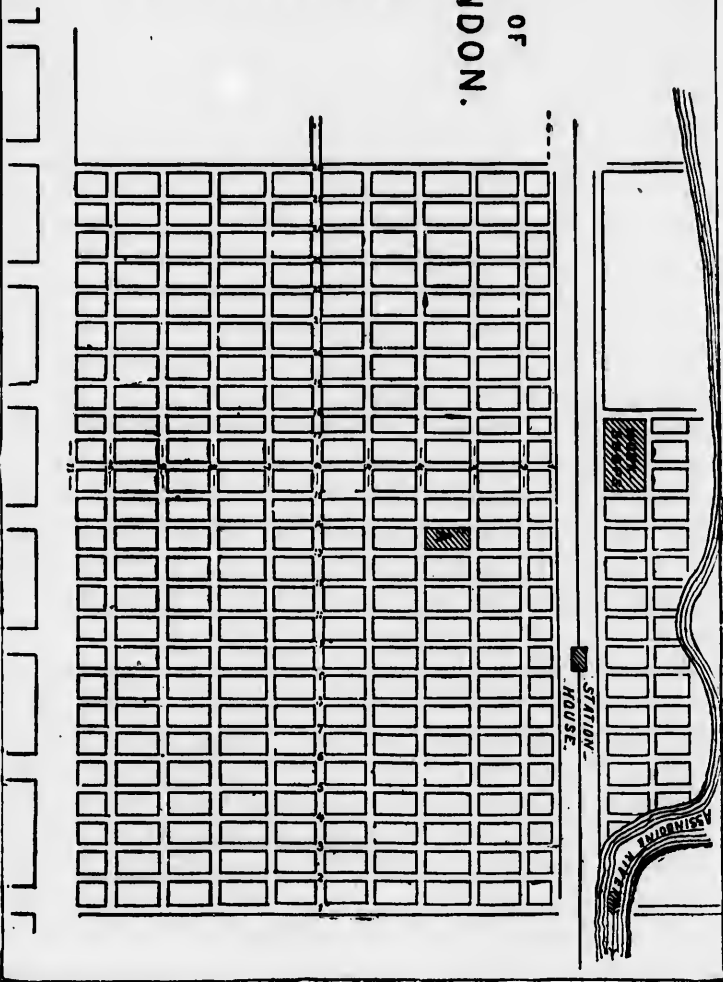
tance back on both sides, the country rises gradually until the general level of the prairie is attained. The valley lying between these elevations well deserves the name of "Grand." It is certainly destined to be a place of great importance both as regards its farming capabilities and railway and steamboat privileges. The soil, however, on the south side cannot be called first-class, as it contains much sand and gravel in the ridges back from the river, and many boulders on its surface. There is none of it, however, that will not be taken up, if indeed any of it has been left since the "boom" of last summer.

About eight miles south of Brandon lie the "Brandon Hills," which are very picturesque on the east side, as they rise ridge over ridge from the level of the Souris, which here runs in a deep valley. Aspen is still found in some abundance along the slopes, but much of it is useless except for firewood. Standing 150 feet above the plain, on the most western ridge of the Brandon Hills, the traveller once looked over a vast grassy plain stretched out at his feet, without bush or mound to break its uniformity, except one solitary conical hill rising from the centre. Now, standing on the same point, he looks no longer on a solitary waste, but sees the plain dotted with the cabins of the settlers, and their cattle grazing peacefully in the little valleys or up their slopes. One short year more and stacks of grain will be grouped over every part of the plain, and what in the spring of 1880 was a vast prairie covered with waving grass, will, in the spring of 1882, be alive with settlers, and its solitude and loneliness gone for ever.

Proceeding westward on the line of the C. P. R., the soil is a light sandy loam for a number of miles with many boulders near the railway. Beyond this, the country is first-class and comparatively level, but altogether without wood. About eleven miles out from Brandon, a patch of sand hills of about a square mile in extent is passed on the left, containing

PLAN OF TOWN BRANDON.

1. PACIFIC AVENUE.
2. ROSSER D.
3. PRINCESS D.
4. LORNE D.
5. LOUISE D.
6. VICTORIA D.
7. F. TAVISH D.
8. VAN HORN D.
9. PARK D.
10. COLLEGE D.
11. SOUTHERN D.
- A. MARKET.



some wood, consisting of oak and aspen of small size, fit only for fuel. These hills—like all sand hills—are flanked by marshes and hence protected from fire by water. Westward from this point to Flat Creek the railway keeps to the marshy plain, which extends all along the base of the high rolling country more to the north, and which lies between it and the Assiniboine.

The tract lying between Flat Creek on the south and Gopher Creek on the north, is generally low and marshy, or consists of sand hills, altogether unfit for farming, but eminently suited for grazing purposes. In the marshes around the hills immense quantities of hay can be cut. There is good pasture, wood, and shelter in the hills themselves and permanent water abounds.

After passing the last mentioned creek the land rises gradually and its character at once changes. An excellent farming country is entered upon, which extends with very little change to Moose Mountain, a distance of nearly sixty miles. For the whole distance the soil is rich and fertile, having a black sandy or clay loam surface soil, with the sub-soil varying from gravel coated with carbonate of lime in the ridges to a light ash-colored clay in the more level parts. All the water is good as far as the 102nd Meridian, but beyond that very little is found except in Moose Mountain itself.

Pipestone Creek, flowing in a narrow valley about 190 feet deep, was, when I crossed it on the 26th of June, a rapid stream about twenty-one feet wide and thirty inches deep. It rises in the high country between the Qu'Appelle and Moose Mountain, and flows to the southeast into Oak Lake, described in a previous chapter. Near the lake the banks of the Pipestone are low and the valley not so confined, but as the stream is ascended the valley narrows and becomes much deeper, so that it is with extreme difficulty that carts can be taken across it. The summit of the valley slope is generally

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covered more or less with boulders, but this is no unusual occurrence, as the higher slopes of nearly all the river valleys of the plains are similarly covered. The upper part of the valley is filled with wood, which extends in clumps into the Wolf Hills, that were formerly covered with fine forests of aspen, but these have nearly all disappeared within the last thirty years.

The Weedy and Wolf Hills are a continuation of the Moose Mountain ridge, and are of the same general character. Many diverse opinions will be expressed regarding this region, as men of various temperaments view it. To one it will be a land of ponds, marshes, willow bushes, aspen clumps, and rolling hills, altogether unfit for farming on account of the broken character of the surface. Another seeing these characteristics will consider each one an element of future good, and will say, this is a land destined to become the garden of the North-West. Both will notice that the soil is unsurpassed for richness, and as they examine the rich black clay loam, the croaker will declare that the soil is too rich, and that wheat would be sure to lodge owing to the length of straw. These objections have been urged to myself time and again, but they fall to the ground when fairly tested. The tract to which these remarks apply will be in the market the coming summer. That part of it west of the 102nd Meridian, included in Ranges from 1 to 10 west, and Townships 15, 16, 17, comprising about 2,000 square miles, will be found superior to any other locality yet opened for settlement.

The Qu'Appelle River joins the Assiniboine about three miles above Fort Ellice. At its mouth, and for twenty miles up to the mouth of the Big Cut Arm Creek, it averages seventy feet in width, with a depth of from eight to twelve. Cut Arm Creek comes in from the north and has a width of twenty-five feet, with an average depth of about three. Between Big Cut Arm Creek and the Fishing Lakes, the

river still retains its size, being very little under seventy feet in breadth, but its depth varies from three to ten feet. Between the Second Fishing Lake and the Assiniboine, the distance in a straight line is about 110 miles, but by the winding of the river in its valley the distance is increased to 270 miles. Qu'Appelle Post and Mission are situated between the four Fishing Lakes, which are noted for their great depth and the abundance of white fish (*Coregonus albus*) drawn from their waters. Above these lakes the river still retains a breadth of forty feet, but the depth decreases, so that at the Grand Forks, or outlet of Long Lake, it has become an insignificant stream. The total length of the valley is about 250 miles, but owing to its tortuousness the river cannot be less than 500 miles long. The valley for the whole distance averages fully a mile in width, and its depth varies from 200 to 300 feet. Small steamers can ascend to the Mission without difficulty when a few obstructions, caused by boulders, are taken out of the river's bed. The eastern end of the valley is of little value, as sand dunes and gravel hills choke up its northern side. Before Big Cut Arm Creek is reached the soil of the valley becomes very rich, and this is its general character for nearly 200 miles.

GENERAL DESCRIPTION OF THE COUNTRY NORTH OF THE
QU'APPELLE.

Extending from the Qu'Appelle, northwest by Pheasant, File, and Touchwood Hills to Quill Lakes, eastward to the vicinity of Livingstone, and southward, a little east of the 102nd Meridian, is a tract of country containing at least 7,000 square miles, or about four and a half million acres of excellent soil. It is true that the western side is almost devoid of wood, but to compensate, the hills, extending all along its flank, are covered with trees Pheasant Plain, which extends from the crossing of the Pelly

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Road eastward for twenty-five miles, is altogether without wood, but the soil is exceedingly rich, and at no point is the wood to the southwest ten miles distant. Proceeding northward of the travelled road, the country becomes more broken, ponds and marshes are numerous, and wood increases both in size and quality, until it merges into continuous forest south of the present telegraph line. A rich black loam, about fifteen inches in depth, containing small grains of quartz or other rock, is the prevailing surface soil, but this imperceptibly passes into lighter colored sandy loam, as the timber becomes more continuous and of larger growth. The subsoil is generally a light colored marly clay, but this again, in the ridges, passes into gravel, which is generally gneiss covered with a coating of carbonate of lime.

From a little west of the 102nd Meridian, boulders are numerous for about twenty miles, and occasionally afterwards, but no soil is seen too stony for successful cultivation.

At many points we dug into the subsoil, and found it as above. Tested with acid, it always gave indications of a very large percentage of carbonate of lime.

The timber, on the tract passed over by me, is of very little value, but good poplar for building purposes will be found on the hills. Other explorers, who travelled the northern and eastern portion of this section, speak highly of its timber and of its being in considerable quantity. Spruce is also found in the northeastern corner of it.

Good water seems to prevail throughout the whole region, although the running streams are few and quite small. Leach Lake, being fresh water, may contain fish. As there is abundance of timber in that section and good water, a large settlement will spring up in a year or two.

The grass marshes so frequently spoken of, are abundant in this section, and are from the size of a flower plot up to a number of acres.

Long or Last Mountain Lake lies in a depression that has a gentle descent from the east, extending over at least ten miles. It is forty miles long and has an average breadth of about one mile and a half. At its southern extremity a small stream, running in a deep but comparatively wide valley, discharges its surplus waters into the Qu'Appelle. This point is named the Grand Forks. Close to it must be the future city of the C. P. R., as a branch line will be run before many years along the shores of Long Lake. Near the outlet of the Lake the banks are high but they gradually disappear, the high land on the one side passing into Last Mountain, and on the other forming an escarpment on the west side of the lake.

The waters of the lake are sweet and pleasant to the taste, quite clear and of great depth. Multitudes of fish are caught here every fall by Indians who come down from the Touchwood Hills for the purpose of fishing. This lake and the four Fishing lakes in the valley of the Qu'Appelle are noted for their Whitefish that for many years have been a source of supply to all the Indians of the valley. Before many years steamboats will be plying on its waters, and the lovely land bordering on its shores will be dotted with farmhouses.

Except on Last Mountain no wood is to be seen, but coal can be supplied by means of the lake and the C.P.R. One of the richest tracts in the Qu'Appelle valley lies east and north from Last Mountain and when known will be speedily taken up by farmers, as the much dreaded frosts of the Saskatchewan valley are unknown.

While encamped near the head of this lake, in 1879, we had ample opportunity to examine this portion of the country. We were particularly charmed with its soil, productions, and position. Multitudes of pelican, geese, ducks, avocets, phalaropes, water hens, and grebe, besides innumerable snipe and plover were everywhere in the marshes

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at the head of the lake or along its shores, or on small islands lying to the south of the camp. This was early in July and experience tells me that not one-tenth was then seen of the bird life assembled in September and October.

To the east of the head of the lake lay the rich country which produced the enormous mushrooms referred to in Chapter XI, when speaking of the lilies and other flowers which caused me to call this region the "Flower Garden of the Northwest."

Passing round the head of Long Lake, from the east, we found a creek a few yards wide, with a sluggish current and a very miry bottom. Scarcely a mile from the first creek, we came to another of a totally different character. This creek had a gentle current of clear water, was nearly three feet in depth, and about eighteen wide. A fish weir was seen a short distance above our crossing, showing that fish ran up stream in the Spring. In half a mile, we crossed another creek, but this contained much less water.

The middle creek, which is much the largest and which certainly contains fish in Spring, seems to be the stream which discharges Wolverine Creek. I believe the land on this stream will be found of unquestionable value, as the water in the creek was quite pure.

The section lying west of the 102nd Meridian is bounded on the south by the Qu'Appelle, on the west by Long Lake, and by a line running northeasterly from the head of Long Lake to Quill Lakes. It may be said to have, both as regards surface and subsoil, a similarity of character, varying from deep black clay loam, with a light colored marly clay subsoil, to a light sandy or gravelly loam, with a gravelly subsoil. Some travellers taking the washed out subsoil thrown out by badgers, or found in cart ruts, as the real soil of the prairie, have characterized parts of this region as gravelly and sandy, but pits dug into the subsoil showed but a small percentage of either.

Abundance of good water is found on every part of this tract for the greater part of the summer, and future settlers will find that good permanent wells can be obtained, at a reasonable depth, on any part of the prairie. Poplar wood for house-building, fencing, and firewood, can easily be procured at Pheasant, File, and Touchwood Hills, which extend from southeast to northwest through its whole extent. Almost continuous woods extend along the Carlton road, from twelve miles east of its western boundary to where the Qu'Appelle and Pelly road crosses it. Thence, eastward, extends the Pheasant Plain, a stretch of twenty-five miles long, without wood, but Pheasant Hills having abundance of it, are always in sight. East and northeast of this plain, copse wood is more or less abundant, until the Assiniboine is reached. West of the hills spoken of, no wood exists, but the soil is of the very best description.

A depression, of which Long Lake partly fills the southern end, extends up to Quill Lakes. Although less than twelve miles wide where it crosses the travelled road from Carlton, the name of "Great Salt Plain" is given to a tract thirty miles from east to west. This valley contains many lakelets of brackish water. An alkaline creek, which crosses the road, seems to discharge the surplus waters of Quill Lakes into Long Lake. In this depression no wood is found. In fact, not a bush, so far as known, grows on a belt of country twenty-five miles wide, extending from the Qu'Appelle to Quill Lakes.

I may here state that the appearance of the country just described, was altogether different from what I expected. I had been led to believe that much of it was little else than desert. Having crossed that part of it north of the Qu'Appelle, in the summer of 1879, I can speak with certainty of the fertility of the immense plain sloping towards that river on both sides.

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jecting a line nearly due west to the South Saskatchewan, a distance of over 250 miles, and including only the land south of the Touchwood Hills, a belt, with an average breadth of 100 miles, extends right up the Qu'Appelle. Here we have 25,000 square miles, or 16,000,000 acres of land lying in one block, that to my own knowledge, has over 90 per cent. fit for agricultural or pastoral purposes. The only poor soil in this extensive tract is that portion between Spy Hill and Fort Ellice, and two small groups of sand hills, lying at the sources of the Qu'Appelle. No alkaline soil is known on any part of it, except a narrow tract extending from the head of Long Lake toward Quill Lakes. Numerous small brooks are found on both sides of the river, and where there are no brooks, ponds of good water are seldom wanting. There will be no difficulty in obtaining first-class wheat crops throughout the greater part of it, as the soil is generally a rich black loam, mixed with silica, and at times containing more or less gravel. The subsoil, in nearly every case, is a light colored clay, or clay intermixed with pebbles coated with carbonate of lime. Nearly the whole of the surface is a gently undulating plain easily drained, and over three-fourths of it sloping to the south. The crops at the Qu'Appelle Mission, about the centre of the area, ripen earlier than in any other part of the North-West; barley having been cut, both in 1879 and 1880, during the last week in July. No summer frost has ever been reported from this region, and authentic reports say, that the spring is two weeks earlier than at Winnipeg. Forty miles west of the File Hills, wood is no longer found, and from that to the Saskatchewan, not a bush of any description is seen.

Moose Jaw Creek, about eight miles below its confluence with Thunder Creek takes a great bend to the east. At this point the sides of the valley are one hundred and forty feet deep. The breadth of the Creek is only sixteen feet, with about four inches of flowing water. Small clumps of maple and ash were observed, but no poplar.

For the last twenty miles east of the Creek the country was very dry, and shewed signs of drought but the soil was rich and the grass tall. At our crossing, the creek flowed from the southeast, but a short distance lower down, it turned almost due east and then north, until it emptied into the Qu'appelle.

West of Moose Jaw Creek the country changed at once, and four miles south of our crossing passed into sand hills which extended as low mounds from that point westward and northward.

For thirty miles west from the creek the country was very dry, and frequently sand and gravel hills were seen with occasional patches of cactus, *Opuntia Missouriensis* where the surface was sandy; but much good soil covered with rich grass was also passed. To the south of our line of travel the country was more hilly than to the north.

As we neared the base of the Coteau, alkaline plants became common, and small brackish lakes frequent, these being the usual harbingers of the approach to the Third Prairie Steppe, or Coteau. At every point where I have touched the Coteau I have noticed saline soil which has evidently been formed from the washing away of the face of the hills.

A journey of twenty-eight miles, through a broken hilly country brought us to the head of Old Wives Lakes, which lie in a depression between the hills. The head of the northern Lake, is a series of detached alkaline ponds with mud margins and very brackish water.

The waters of the Lakes are quite clear, but very salt. Strange to say, environed by the before mentioned salt pools a spring of excellent water was found not 100 yards from the head of the northern lake. This Lake is quite shallow for a long distance out, and the eastern side for many miles is much indented by points and bays. The western side is less broken, and is backed by higher hills than those which rise

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to the east. The twenty-eight miles of broken country passed through before reaching the lake, is well suited for pasturage, as there is abundance of water both fresh and brackish in the hills, and the soil is of varying character, sand or gravel prevailing.

Passing west from Old Wives Lakes, the hills change their character and run in parallel ranges, from northeast to southwest with abundance of good pure water in ponds. Occasional swampy lakes varied the scenery. For about twenty-one miles west of the lakes, very little of the land could be claimed as agricultural, but all is excellent pasture.

In the fifty-one miles referred to above, the leading grasses were all of the most valuable kinds for pasture. They were noted for their value in the following order. *Stipa spartea* (wild oats as named in Manitoba), took the lead, as indeed it does on all fairly dry and rich soils from Fort Ellice to the Rocky Mountains. This grass is preferred at all seasons by horses when travelling on the prairies, except late in July and August when its seeds are ripe. After the frosts come, horses always seek for this grass, and it is this species that constitutes the principal buffalo grass of the great plains. The other or more southern buffalo grass (*Bouteloua oligostachya*), easily known by its curling leaves, and peculiar panicles of flowers was seen in some abundance on the drier knolls, but it is only found in quantity where the soil is inclined to be arid, or much further to the southwest. *Triticum repens* (Couch or Quick grass), is always found where the soil is a strong clay, and wherever it is abundant, sand is not to be found. *Koeleria cristata* and *Poa coarctata* grasses which have a tendency to grow in bunches, and are hence often classed as "bunch grasses," were comparatively common on the dry hills. These five species may be said to constitute the bulk of the western pastures, but more especially the three first mentioned. *Artemisia cana*

(Canadian sage brush), was met with in some abundance on the clay plain, twenty miles west of Old Wives Lakes, and is the same plant as that found by Palliser, nearly in the same longitude, at the Elbow of the South Saskatchewan, and called by him *Artemisia tridentata*, or the true American sage brush, which in reality never crosses our boundary east of the Rocky Mountains. This plant is no proof of aridity of climate as it is found only on Cretaceous clay, and wherever that crops out it is sure to be seen. At the present time it is growing at the base of the hill on the left bank of the Assiniboine, just opposite the mouth of the Qu'Appelle at Fort Ellice, and as a proof that even the presence of the cactus does not always indicate aridity of climate, I may state that anyone may find cactus growing in the Qu'Appelle Valley, just south of where the Carlton road ascends out of it. Here then are the two plants, which former writers cited as proofs of the aridity of the climate of our western plains, found growing in the neighborhood of Fort Ellice where the rain-fall is known to be abundant, because here they find a suitable soil--the first mentioned, clay, the latter clay and sand with a suitable amount of alkaline matter.

Twenty-five miles west of Old Wives Lakes, is a fine large fresh-water lake, called Bullrush Lake, which is at least eight miles long and five broad. Three creeks enter it from the north and west, and another discharges its surplus waters from the south end. Clay cliffs over sixty feet high, are along the eastern side, and its waters, even at less than a rod from the shore, are very deep. At the north end of the lake, the trail from the Elbow joins the other coming from Qu'Appelle. Four miles east of the lake, good agricultural land was entered upon, which extended all around it. As we rounded the north end a sluggish stream was crossed, and beyond it another with water standing in deep pools. These streams come from the north. About two miles to the south another

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and larger stream was found coming from the hills and emptying into the head of the lake. Crossing the plain and a narrow range of hills with a rich, sandy loam surface soil, we descended into another valley and here found Strong Current Creek flowing to the east. Within a short distance, it turns to the north and enters a range of hills which shuts in the valley on that side. The creek flowed down a valley from the west and meandered through it, having banks about ten feet high. Its bed was thirty yards wide, but there was flowing water only over part of it. A few willows grow in its bed, and these were the only brush seen in seventy-six miles, as not a bush exists around any of the lakes spoken of.

Nearly the whole of the tract lying between the Cypress Hills and Old Wives Lakes, has excellent soil, and at times spreads out into wide, slightly undulating plains, covered with tall, rich grass. In other parts high rolling hills with deep valleys, having a northwest and southeast direction, are met with. Old Wives Creek receives the drainage of all these hills, but it is only in spring that any flow of water passes over its stony bed. The highest land is always to the north and west, and some of the ridges or narrow plateaux passed over, were found even higher than the eastern end of the Cypress Hills. Occasionally brackish lakes were seen, but water of any description was not abundant, although we never suffered from the want of it. The last twenty miles was over a gently undulating plain, with fair soil and but little water. As we approached the Cypress Hills, they rose before us bodily from the plain to the height of 400 feet, with the various ravines which penetrated the eastern face of the escarpment filled with wood. Along their base were the usual alkaline ponds and poor soil, but these were much restricted as Strong Current Creek was found flowing south along the base of the hills. After passing three miles south of our camp, it turns boldly to the

north, so that before reaching the hills we were compelled to cross it twice in less than two miles. Blue hills shut in the horizon to the north; twenty-five miles to the south-east lay the high ridges we had left the preceding day, and an interminable plain stretched away to the south, while in our front were the Cypress Hills themselves.

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CHAPTER V.

Character of Country between lat. 51° and 52° West of Manitoba.

Country West of the Assiniboine—Beaver and Touchwood Hills—Heavy Forest—Rich and Lovely Country—Great Salt Plain—Immense Plain to the South—Tract North of the Qu'Appelle—Rich Soil and Rank Grass—Last Mountain—Water Scarce on Surface—Broken Country, Twenty-two Miles Wide—Fine Pasture Lands—No Bad Soil in Eighty Miles—Lines of Boulders, near Humboldt—Cause of Wood at Certain Points—Extensive Plain Southwest of Touchwood Hills—Salt Marshes—Little Touchwood Hills—Mission at this Point—File Hills—South Saskatchewan, Voyage Down It—Moose Woods—North of Moose Woods—Land East of River—Soil of Great Depth—Aroline, or Telegraph Crossing—Rich Land—Country West of River—Fine Level Tract—Eagle Creek—Eagle Hills, Fine Country for Stock.

AFTER passing above the mouth of Shell River the land on the right bank of the Assiniboine becomes exceedingly rich, and in every respect as good as that east of the river. All travellers and surveyors speak in the highest terms of the land west of Fort Pelly and south of the telegraph line, and although much of it is wet and generally covered with forest or brush it is a very desirable country. The Beaver and Touchwood Hills farther to the west are covered in part with heavy forest, and although not suitable for present settlement, owing to the forest and marsh which predominate in some places, yet there are large areas covered with a wealth of tall grass, pea vine, vetch, and lovely flowers that will tempt the pioneers of the next few years to locate in the park like country both north and south of these so-called hills.

Extending west from the Touchwood Hills, is a level plain without wood for thirty miles on the line of the Carlton trail. This plain has been erroneously called the Great Salt Plain, whereas the part of it to which the term applies, is scarcely twelve miles wide on the trail. Stretching westerly

from the hills, a plain over 120 miles wide extends to the South Saskatchewan. For nearly the whole distance, the surface is undulating or quite level with occasional waves a mile or two apart. Scarcely a twig exists on the whole plain. Fresh water and excellent soil are found everywhere. In the southern part, near the head of Little Arm Creek, the country is broken into rolling hills, but the soil is very rich.

The following description of this tract was written on the ground, and gives a general picture of this section. The country described is generally on the 106th meridian from the Qu'Appelle River north.

Our course was now due north for eighty miles, so as to traverse the great plain, extending northward from the Qu'Appelle, in its greatest length. The soil of this plain was thought to be generally sandy, so I resolved to examine it every mile for the whole distance. We did not expect to find any wood and but very little water on the journey, so, after filling our kegs and piling a week's wood on our carts, we started north.

Ascending out of the valley we found that the upper part of the slope and the outer margin of the plateau, were covered with boulders just as we had found them on the southern side. As we receded from the river, the plain crossed on September 11th began to assume the appearance of a range of hills, but we knew it was only the undulations rising slightly one over the other, and that no hills existed in that direction. This is the Eye Brow Hill Range of Hind's Report. For sixteen miles from the river, the plateau was almost level, with a slight rise to the north. The soil near the river was a light sandy loam with short grass, but this soon changed for the better and the grass became taller.

From the crest of the plateau, spoken of above, we could see an immense distance to the west and north over a bound-

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less plain. Apparently about forty miles off, Last Mountain rose from the plain, standing alone being a very prominent object on the horizon in the northeast. Our course led us along the edge of the plateau, and occasionally "cut banks" could be seen in the distance, showing the course of Little Arm Creek. All day we travelled over a level prairie, covered with good grass, and having excellent soil but not a drop of water except at the creek. Another day, over the same level prairie, with Little Arm Creek flowing through it, brought us to the margin of a broken, hilly country which extended east and west as far as we could see, and was twenty-two miles from south to north.

As we proceeded north, the soil constantly improved; the grass was always tall, water abundant and good, and this tract although rough and much broken by lakelets, ponds, hay-marshes, and hills, had a rich soil and was well suited for pasture everywhere. Near the head of Little Arm Creek, clumps of bushes were observed nestling along the margin of some lakelets. These showed that, if fires could only be stopped, bushes suitable to shelter stock would soon grow up.

A descent of 100 feet brought us to a plain, which extended far to the north, while the hills we had just left, ran almost due east and west. Fifteen miles over the plain brought us to our most northern limit, latitude 51° 43'.

In travelling the eighty miles just described, I never observed bad soil. No sandy soil was seen except close to the Qu'Appelle. The greater part of the surface was level or gently rolling, and where it did rise into hills, the soil was always good. I constantly dug into the dry knolls and found excellent soil, although pebbles were on the surface and boulders were frequently seen. For the first thirty-five miles water was scarce, but after that it was always plentiful. Brackish water was never detected, except once, until we descended from the line of hills. After that

occasional pools were seen in circular depressions or narrow valleys. For the last fifteen miles boulders on the knolls were of constant occurrence. Occasionally the country became more rolling and a few willows and small poplars about two years old were seen around the hollows, but not large enough to use as fuel.

Turning east we travelled for twenty-five miles over either a level or undulating prairie, with a clay loam surface soil, having numerous boulders at times scattered over it. The high ground left on Saturday, Sept. 11th, was seen in the south, but to the north a high undulating country alone was visible, with occasional patches of small wood.

We now crossed a stony tract about five miles wide, running north and south, and afterwards entered on a level sandy loam plain, which extended to Wolverine Creek, a distance of six miles. This plain showed signs of alkali, and was the poorest land we had seen since leaving Strong Current Creek. After getting a supply of wood and communicating with Humboldt so as to fix our longitude, I turned south for the purpose of traversing what is known as the Great Salt Plain. Had the country in the vicinity of Humboldt continued as good as farther south, no wood would be found here either, but the stony tract referred to with numerous marshes, ponds and long narrow lakes, lying south of the woods, stops the fires and saves the wood. The soil near the margin of the woods was a dark colored sandy loam, containing a very large percentage of silica.

This sandy and alkaline soil vanished as soon as we crossed Wolverine Creek, which is here nothing but a series of pools connected by sloughs. Proceeding south we entered upon a very level plain, which continued without change, except for the better, for thirty miles. Many clumps of small poplars of from one to six years growth were passed, and occasionally a narrow ridge or roll in the prairie, but nothing like a hill was seen for many miles. Near the

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centre of this tract we crossed a fine creek twenty feet wide, with two feet of flowing water in it, which is probably the discharge of Quill Lakes, and is the middle creek that enters the head of Long Lake. The creek merely runs in a slight depression, with banks nowhere more than four feet high, margin always dry and no signs of alkali. For many miles a higher tract could be seen to the west, with many prominences covered with trees or brushwood, but this disappeared or merged into the high country which lies to the southwest, and which is a continuation of the elevated region described as extending east and west from the head of Little Arm Creek. In the direction of the Touchwood Hills high rolling land could be seen, with occasional patches of wood.

On this whole plain the greater part of the grass was tall enough for hay, water was abundant and always good, the soil invariably a rich sandy or clay loam, and no gravel except in the subsoil. The only poor land observed was a narrow strip on each side of Wolverine Creek.

Crossing a small stream flowing nearly west we passed for six miles through a very fine country with rich soil, but all the depressions were alkaline and the marsh water generally brackish. The country at this point seemed to be covered on the higher ground with a thin coating of drift, but this in the lower places gave place to Cretaceous clay, which here took the form of white mud swamps instead of the hard baked clay flats of the southern prairies, where the rainfall was light. Having reached a small creek flowing to the west, and seeing Last Mountain lying southeast of us, we changed our course to the southeast before crossing the creek, and very soon entered on another part of the plain spoken of above, which was much more difficult to cross owing to numerous white mud swamps that lay in our course. Reaching the creek again, now flowing in a valley about half a mile wide, and crossing it with extreme difficulty, we entered on a fine undulating country of great extent.

The tract described above is the only alkaline soil we saw on the "Great Salt Plain," which certainly is a misnomer, as I stated in my report of last year. That an extensive, treeless, and in some parts waterless plain, extends west and northwest from the Touchwood Hills I admit, but I do not admit, and am prepared to disprove that an alkaline plain thirty miles wide extends either on the Carlton trail or any other line west or northwest from the Touchwood Hills. There is undoubtedly a saline depression extending from Quill Lakes to Long Lake, the worst parts of which are largely made up of white mud swamps or brackish marshes, but there are no data to show that it covers twenty per cent. of the area assigned to it.

The country around the flanks of the Touchwood Hills is much broken or undulating, and has a good rich soil varying from dark colored clay loam to sandy loam. It is always covered with a certain amount of dark earth, and frequently, when gravel is seen on the surface, none is found by digging. The subsoil is usually a light colored clay loam, containing more or less gravel, which is generally covered with carbonate of lime. A line of broken country connects the Little Touchwood Hills and Last Mountain, and is more or less covered with small poplar copse. Were the country level no wood could grow, as fires constantly sweep over the level ground without obstruction, and destroy all the young wood.

I left my party when we reached the trail leading from Qu'Appelle to the Mission, and found the Missionary getting in his potatoes and other roots. His crops this year were very fine, the frost having done them no harm. He showed me over four hundred bushels of as fine potatoes as I ever saw, and told me all the Indians had abundance of them. Owing to the broken nature of the surface, farming by white men at this point would not be profitable, but it seems just the place for Indians. Patches of good arable land, interspersed with little lakes and hay marshes, were seen everywhere, and

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from the abundance of feathered game at this time (October 1st) it might be called the hunter's paradise. In three or four days any man with a breech loading shot-gun could have supplied himself with his winter's meat, as all lakes and ponds at that time were alive with ducks of many species. Indeed, from the middle of August until the lakes and ponds freeze up for the winter, water fowl are very plentiful everywhere. Multitudes breed in the country, and about the middle of September the sea ducks begin to arrive, and myriads of them crowd every pond.

A ride of fifteen miles over a very rough trail brought me to Touchwood Post, on the Carlton Trail. The country between these two points—especially the western part—is very rough and much broken up by ponds and lakelets, with intervening ridges, but except on the western side near the Mission, nothing worthy of being called a hill was seen. What is generally denominated the Touchwood Hills by travellers is merely the broken country lying between the Little and Big Touchwood Hills, the one lying to the right of the trail, the other to the left. In the vicinity of the Mission, on the Indian Reserve, are fine groves of large-sized poplar, well suited for house building, and, excepting this, very little but second growth aspen and brush was seen.

I may as well state in this connection that the Touchwood Hills and File Hills as regards altitude can scarcely be considered hills at all. They are merely elevated plateaux, or more strictly speaking watersheds, protected from fire by innumerable ponds and marshes, which are scattered everywhere over their surface, and in my estimation can never be first-class farming lands, though well suited for hay and stock farms. The Big Touchwood Hills extend eastward and merge into the Beaver Hills, and both are merely an elevated tract from which the small streams flowing to the Qu'Appelle on the south, or the White Sand River on the north receive their waters. Experience has taught me that

wherever trees and brushwood are found, there we may look for a broken country, and one that contains *too much* water, while the open treeless prairie, generally condemned to sterility, is by far the best farming land.

From the Elbow of the South Saskatchewan to its junction with the North Branch below Prince Albert, the river meanders through a valley of varying width, which cannot be better described than by reproducing the account written by Prof. Hind of his canoe voyage down the River from the Elbow in August, 1858.

"The banks of the river slope gently from the prairie on the southwest side to an altitude of about 250 feet, they then become abrupt. On the northwest side the Sandstone cliff, varying from thirty to sixty feet in altitude, rises abruptly from the river, then follows a hilly slope to the prairie level. Trees, consisting chiefly of aspen, are found in patches on both sides. The river continues about half a mile broad, with numerous sand-bars and low alluvial islands. The drift above the sandstone is gravelly, and many small sand dunes occur on the hill bank sloping to the prairie, and have progressed beyond the prairie to a considerable distance. A treeless prairie, boundless and green, except where the patches of drifting sand occur, is visible on either hand from the top of the bank; below, the river glides with a strong current two and two and-a-half miles an hour, filling the broad trench or valley it has eroded. The June berry, *La Poire*, is very abundant; shrubs or trees, eighteen to twenty feet high, loaded with this fruit, perfectly ripe and of excellent flavor, are numerous in every grove; the berries are of the size of large black currants, very juicy and sweet. This shrub is the *La Poire* of the Red River Voyageurs.

"About twelve miles from our camp, or sixty miles from the Elbow, forests of aspen begin to show themselves on the banks, after passing through a low country, which is an

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expansion of the river valley. Ripple marks are numerous on the fresh mud, the furrows lying parallel to the course of the stream. They are quite recent and similar to those observed on Red River in spring. The ash-leaved maple begins to show itself, but the aspen is the prevailing tree. The woods are not continuous, and the prairie on either side of the river remains bare; it is fast regaining its former altitude. Sand hills are visible in the distance from the top of the bank. La Poire is very abundant and fine flavored. The exposed cliffs consist of reddish loam, and the rock is no longer seen below them. At a point fifty-three miles from the Elbow, we made a careful section of the river, and found its breadth to be nearly one-third of a mile (28 chains); its greatest depth was ten feet on the east side, but on the west side there is another channel with nine feet of water.

"As we approached the Moose Woods we passed for several hours between a series of low alluvial islands, from ten to twelve feet above the water. They sustain some fine elm, balsam, poplar, ash, ash-leaved maple, and a vast profusion of La Poire. The river valley is bounded by low hills leading to the prairie plateau four to eight miles back. The country here furnishes an excellent district for the establishment of a settlement. The spot where we camped for the night is an extensive, open, undulating meadow, with long rich grass, and on the low elevations rose-bushes, in bloom, grow in the greatest profusion. It is only ten feet from the water, yet it does not appear to be flooded in the spring; water-marks and ice-marks are nowhere seen above four feet from the present level of the broad river.

"The region called the Moose Woods, which we entered last evening, is a dilatation of the Saskatchewan flowing through an extensive alluvial flat six miles in breadth, and cut into numerous islands by the changing course of the stream. This flat is bounded by sand hills, some of which are nothing more than shifting dunes. The woods are in patches.

and in the low land consist of balsam poplar, white wood, and aspen. Small aspen clumps cover the hills, but no living timber of importance has been seen as yet, although many fine dead trunks are visible, probably destroyed by fire. The river continues to flow through a broad alluvial flat for about twenty-five miles. Its water is very turbid like that of the Mississippi, holding much solid matter in mechanical suspension.

"Beyond the Moose Woods the banks close upon the river, and have an altitude not exceeding sixty feet. The breadth of the stream contracts to 250 yards, with a current fully three miles an hour. On the east bank the prairie is occasionally wooded with clumps of aspen, on the west side it is treeless, and shows many sand hills. During the afternoon we landed frequently to survey the surrounding country. Nothing but a treeless, slightly undulating prairie was visible; many large fragments of limestone not much water-worn lie on the hill banks of the river, which is about 100 feet in altitude. The river continues very swift, and maintains a breadth of 250 yards. Frequent soundings during the day showed a depth of ten to twelve feet. A little timber displays itself occasionally on the east bank below the level of the prairie.

"At 8 A.M. we arrived at a part of the river where it showed an increase in breadth; it is now about a quarter of a mile broad, still flowing through a treeless plain, in which only one low hill is visible. This character continues for many miles, the hill banks then begin to increase in altitude, and are about 100 feet high, but the river flows through a dreary treeless plain for thirty miles from our camp, after which "The Woods," as they are termed, begin; they consist of a few clumps of aspen on the hill flanks of the deep valley of the river. The face of the country is changing fast, it is becoming more undulating, and patches of aspen woods appear on the prairie; here and there, however, the

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remains of a heavier growth are visible in clusters of blackened trunks ten to fourteen inches in diameter. During the afternoon we anchored to measure the rate of the current. The river is 200 yards broad, and it flows three miles and a half an hour. Its average depth is seven and a half feet."

The land on the east side of the river was examined by Mr. George Simpson, D. L. S., during the past season all the way from the "Elbow" to the Middle Crossing (Batoche's) and pits were dug every twenty miles to the depth of four feet. Excepting a little in the neighborhood of the Elbow, all land passed over and examined by him was first class. He reports that along the river the soil is rather sandy. These views are in accordance with my own. Later still a correspondent of the "Globe" reports that in this sandy belt, Mr. Clark, who keeps the ferry at the Telegraph Crossing, informed him that, though the soil was not particularly promising in appearance, it was remarkably productive. "Everything in his garden grew and matured admirably this season, and he is very confident that grain would do well here. Large quantities of small timber are to be found along the banks of the South Saskatchewan within easy reach, and altogether 'Aroline or the Telegraph Crossing' as it is called, promises to become a prosperous settlement in time."

On the west side of the river the surface of the country is drier and less broken than on the east. Although the soil is sandy loam and contains some gravel and in places boulders on the surface, taken as a whole, the district between the two rivers, south from Duck Lake, to the Moose Woods, will make a fine agricultural settlement. I know that all manner of reports have been spread regarding it, but I still cling to my own opinions, corroborated as they are by the thorough examination of Mr. Simpson and the intelligent correspondent of the "Globe" who remarks of the section west of the river:—

"For the first few miles this morning the trail led along fine uplands, from which we were enabled to take our last look at the great discolored slopes away to the north of the river, where the purple bronze of the leafless bluffs contrasted richly with the limitless stretches of pale yellow prairie grass, a glorious boundless expanse that will some day be dotted over with countless farm houses, and be the home of a hardy, wealthy, and prosperous community, but which is now only pressed by the stealthy tread of the coyote as he chases the timorous hare, and where even the lonely moose is seldom disturbed by the prowling half-starved savage.

"As we left the bank of the great prairie stream of the north, we passed through broad stretches of treeless plain, where the soil is both rich and dry, but the presence of many small boulders is likely to render it unpopular with farmers so long as the settler has so much choice country from which to select.

"We have travelled some twenty-nine miles according to our own estimate of distances through open, treeless prairie, where the soil looks rather light and gravelly, but where the rich growth of buffalo grass would indicate that it is much more productive than it appears to be. Indeed it is rather difficult to judge fairly of a prairie country at this season of the year, as everything looks parched and dried up with the severe frosts of early winter."

Westward of this tract the country gradually merges into the broken ground along the southeastern part of the Eagle Hills. Before reaching these, Eagle Creek is crossed flowing through a valley covered with tall rich grass, and beyond, the hills rise in tumultuous masses without any order. Nearly all the land is good. In all the valleys the grass was of sufficient length for mowing. Excellent fresh water is found everywhere. Few localities could be found better adapted for stock raising than this part of the Eagle Hills. Should fire wood and shelter be wanted all that is necessary

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is to move farther north towards the Saskatchewan, where there is abundance of both in the Eagle Hills. Numerous brooks of never failing water flow from the hills into the Saskatchewan.

CHAPTER VI.

Character of Country between lat. 52° and 53° West of Manitoba.

Porcupine Mountain—Country on Red Deer River—Soil very Rich—Exhaustless Fertility of the Carrot River Country—Prince Albert Settlement—Its Early History—Wonderful Progress in a few Years—Description of the Settlement—Many Houses in Course of Erection—Fall Sowed Wheat a Success—No injury from Frost—Duck Lake Settlement—Fort Carlton and its Vicinity—Country between the Rivers—Eagle Creek—The Bear and Eagle Hills—Land South of Them—Description of Battleford and Vicinity—Its Future Sketched Out—Land in the Neighborhood—Character of Soil—Police Farm at Battleford—The Government Farm—Remarkable Vitality of Seeds—Depth of Roots in the Soil—Plain South of Battleford—Coulées of the Plain—Their Origin—Country North of Bear Hills—Splendid Pasture Land—Water Abundant—Grasses of the Plains—Cause of Absence of Wood—Constant Prairie Fires—Why the South side of a Hill is without Wood—What Causes Aridity—Description of Hand Hills—Cactus not a Proof of Aridity of Climate—Fine Rich Land South of Battleford—Immense Area of Good Land—Manito Lake—Sounding Lake—Neutral Hills—Fine Pastoral Land to the Southwest—Land around Sullivan's Lake—Fine Land West of Sounding Lake—Rich Country at the Head of Battle River—Millions of Tons of Hay in This Region—General View of the Country—Lakes Filled with Fish—Beaver still Numerous—All Lakes and Ponds Filled with Birds in Spring and Fall—Bears and Wolves Numerous some Seasons, but Never Injurious Except to Small Stock.

THE Porcupine Mountain lies west of the Duck Mountain, and is separated from it by Swan River and its valley. It is bounded on the east and north by marshes, but on the south and west it passes by easy transitions into the more elevated plateau to the west. The "Mountain" itself is covered with a heavy forest of spruce and aspen. The trees, being preserved from fire by the surrounding marshes, attain a large size.

Red Deer River, emptying into the northwestern corner of Lake Winnipegosis, passes through a fine country. Its upper part possesses a soil only excelled by that of Carrot River, a fine stream which flows parallel to it and empties into the Saskatchewan, east of Cumberland House. All travellers and explorers unite in praising this extensive

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region, and settlers who went there two years since, have produced enormous crops on soil which is practically inexhaustible.

Marcus Smith, C. E., who travelled through this region in 1879, thus expresses himself regarding it: "We travelled southward from Fort a la Corne to Carrot River, and up the banks of the latter to its outlet from Water Hen Lake. Here we found several fields of wheat with very heavy crops nearly ripe, and two farm homesteads. I examined the well at one of them and found a depth of six feet of black mould on the top, with sixteen feet of stiff clay loam to the bottom of the well. Mr. Robinson, the proprietor, informed me that this summer fourteen farms had been selected and a number of farmers were coming in next spring.

"We started from the Lake on a course 30° east bearing for Little Quill Lake, and reached the summit of the range without difficulty, about nineteen miles from the Lake, in which the rise is less than 200 feet. The surface of the ground is very uniform, the soil of the richest quality, and several feet in depth. It is equal to the best parts of Manitoba—chiefly prairie with scattered clumps of poplar and willow, till near the summit of the ridge, which is nearly covered with a forest of poplar. Between Humboldt and Quill Lakes the country is variable in some places, low and swampy where there is much willow brush, but eastward of this line, where the trail crosses the telegraph line, there are several miles of a beautiful park-like country, the trail wandering in open glades through groves of aspen. Before we reached the Quill Lake we came upon an alkaline plain extending northward to the telegraph line; this continues eastward to near Fishing Lake, and probably also to some considerable distance north of these lakes."

Prince Albert settlement, situated between the two branches of the Saskatchewan, was originally a Presbyterian Mission established about fourteen years ago by the Rev.

Mr. Nesbitt. For some years after its location, it was thought that besides christianizing the Indians they could be taught farming, but buffalo being plenty they would not settle.

In the summer of 1875 Captain Moore, an Irish gentleman of means, brought machinery for a steam saw mill on waggons from Winnipeg a distance of fully 700 miles by the road they had to travel. From that time the progress of the settlement was assured. Besides the saw mill a grist mill was erected, and flour at once fell to Winnipeg prices, but owing to the large amount required for the Indians it is much dearer at present.

The progress of Prince Albert during the last six years has been astonishing, and at present it is the most important point west of Brandon. In 1877 there were about 500 people in the vicinity, and about 1,200 acres under cultivation. Now report says there are 3,000 people in the neighborhood. The correspondent of the Toronto "Globe" writing from Prince Albert last August thus describes the settlement:—

"The settlement, or rather the aggregation of settlements, including the Prince Albert District (extending from Fort Carlton down to the junction of the north and south branches of the Saskatchewan), includes a strip of territory about eighty miles from east to west, by fifty miles from north to south. This district contains a white and Half-breed population of about 3,000 souls. Here there are about 10,000 acres under crop, and fully 5,000 acres newly broken this year, the latter figure furnishing the reader with some idea of the rapidity with which settlers have been flocking in within the last year. The town of Prince Albert may be designated as about four miles long by half a mile wide, along the south bank of the North Saskatchewan. The town is situated on a plateau considerably above high-water mark in the river, and is bounded on the south by a narrow and shallow ravine, beyond which rises another bench or

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bluff to the level of the surrounding prairie, which is considerably higher than the plateau upon which the town stands. The population of Prince Albert proper is about 800, but some idea of its rapid growth may be obtained from the fact that there are now no less than thirty-one buildings in course of erection in the town, and many parties intending to build are merely waiting to secure the services of carpenters, which are in great demand just now."

Speaking of early frosts he says: "Mr. Miller informed me that though he had been in the country eight years he had never lost anything by early frosts. He does all his ploughing and sows his wheat late in the fall. In this way the wheat does not germinate till the following spring, but as soon as the frost is out of the surface of the ground, the wheat begins to grow, and is really well on the way before it could be put in the ground under the ordinary system of spring ploughing. Last year there was a pretty sharp frost about the 25th or 27th of August, but Mr. Miller sold his whole crop of wheat at \$1.75 per bushel."

Duck Lake Settlement is located half-way between Carlton on the North Saskatchewan and Batoche's Crossing of the South Saskatchewan. In the summer of 1875 Stobart, Eden & Co. started a store at this point, and the same year broke up a small piece of ground. That small piece has now become a large farm, and, other parties coming in, a fine settlement has been formed. Between Duck Lake and Prince Albert the country is generally a light sandy loam, but much of it would be considered very poor when compared with other sections. South from Duck Lake the land improves and is generally well suited for farming.

Fort Carlton is situated on the right bank of the North Saskatchewan, and has been for some years the headquarters of the Hudson's Bay Company. Here every summer the Council meet and discuss the business of the Company, and receive the returns of the year's trading. Little farming is

done close to the fort, but many fine farms are located between it and Duck Lake. To supply the settlers and themselves, Stobart, Eden & Co. have a portable flour mill, which does good work for the settlement.

The tract of country lying southwest of this between the rivers has been described in the preceding chapter. Lying north of the river is a fine tract that may be seen from the heights above Eagle Creek, and which, when settlement crosses the river, will be very attractive. Eagle Creek, a fine stream of pure water, enters the Saskatchewan at the eastern end of the Eagle Hills. This stream seems to rise in a large coulée that extends many miles into the great plain south of Battleford.

The Bear Hills pass gradually into the Eagle Hills, which, at first, turn to the northeast, but, as they approach the North Saskatchewan, they bend to the northwest and continue in that direction until they reach Battle River, some distance west of Battleford. At Battleford their base is about eight miles south. As they pass eastward they draw nearer to the Saskatchewan. Their northern slope is a continuous forest of very good poplar (*Populus tremuloides* and *balsamifera*), which breaks up and becomes interspersed with prairie as it approaches that river. Between Battleford and Eagle Creek no less than twenty-two small streams issue from the forest and make their way into the river. Owing to these streams, the country between the hills and river is very much cut up, and rendered well nigh impassable for loaded carts, when the hills are wet and slippery.

The land bordering on the river is generally a sandy loam, but many fine farms will yet be located there. In the hills themselves, and southward from them, the land is very rich, the soil being a black clay loam, changing as it gets drier (southward) into a sandy one, but with very little change in vegetation. Mr. Wilkins, D. L. S., crossed diagonally through the hills, while I passed on both sides of them,

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and his report of the land at the Mission and at the Government Farm agrees with my own observations. The land in the southern extension of the hills is very much broken and contains multitudes of ponds and fresh-water marshes, where immense quantities of natural hay of the best quality goes to waste every year. Although many people think the hills the best for settlement, I believe future settlers will prefer the prairie, as there is less broken land, less marsh and swamp, and less labor required to make a home.

As the views of the "Globe's" correspondent regarding Battleford are nearly in accord with my own, I give his description:—

"This place is certainly one of the most beautiful and picturesque in the North-West, and if ever there was a spot which nature intended for the site of a city it is Battleford. The steamboat landing on the Saskatchewan is two or three miles west of where Battle River falls into the larger stream, but for a long way (several miles at least above this) the general direction of the two streams is parallel, though the strip of land between them is seldom above two miles and a half, and in places less than three-quarters of a mile, in width. This strip of land between the two rivers consists of a beautiful plateau of fine, smooth upland prairie. Its highest portion is along its centre, midway between the two streams, and it slopes away gently toward each. The lowest portion of this plateau is fifteen or twenty feet above the narrow strips of bottom land along both rivers, which latter in times of spring floods are sometimes partially submerged. On the other hand the highest portion of this plateau (which the reader will have already identified as the site of the future city of Battleford,) is considerably lower than the level of the prairie bluffs, which rise beyond the Saskatchewan on the north and Battle River on the south. Here is a spot which could be easily drained by sewers falling each way from the central ridge; the whole outer boundary would be

river frontage, at which the Saskatchewan steamers could land at nearly all times, while the smaller craft, which would be required to navigate Battle River, could perform the service from the forks when the larger steamers could not ascend on the south side of the peninsula with safety. With a city located on this peninsular plateau (which is now only occupied by the barracks of the Mounted Police), the south bank of Battle River and the north bank of the Saskatchewan (about four miles apart) would afford the most charming situations for villa and suburban residences.

"Regarding the country in the immediate vicinity of Battleford, I am quite aware that what I have to say flatly contradicts what appears to me to be the general impression concerning it. Before coming here I was told that Battleford was in the midst of a sterile, dreary waste of sand, but I wish we had a few hundred square miles of just such dreary wastes of sand in Ontario and Quebec. The soil is not the deep, black loam which I have seen in other portions of the North-West, but at the same time that it is not unproductive I shall presently produce abundant proofs. It is a rich and very friable soil, in which there is unquestionably some sand, but for all that it is deep, strong, warm and extremely productive. I should have stated before that the few houses (beyond the houses of Government officials, which are on the crest of the beautiful high bluff south of Battle River), are located on a narrow strip of bottom land south of the smaller stream, and the plateau to which I have already referred is the site of the future city."

The police farm at Battleford was established in 1879. In the spring of that year Inspector Walker broke up the soil, and on my visit about the first of August I found everything well advanced and wrote in my journal,—“The police farm, situated on the point of land between Battle River and the Saskatchewan, is a sandy alluvium, and appears to be very dry and barren, but it certainly has produced good

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crops this year. Three months ago it was barren prairie, now oats, barley, potatoes, and turnips, are growing luxuriantly. In the garden, also broken up this spring, are cabbages, cauliflowers, and other vegetables of the finest description. Timothy and clover had been sown to form a grass plot, and these were now in flower and gave promise of producing abundance of seed. The Governor's farm, situated on the sand hills to the east of his residence, was also visited. Here the soil, outside the fence, was covered with the short prairie sward indicative of dryness, and which would have been pronounced as unfit for cultivation by most people, yet within the fence were excellent oats, middling barley, short in the ear but grain fine, and first-class wheat, the latter standing thick on the ground, nearly five feet high, with correspondingly long ears, nearly ripe.

"Besides the exuberant growth of most grains there is a remarkable vitality imparted to them in this region that astonishes a stranger. I am more and more convinced that it is not soil which is the cause of the astonishing crops produced in the west, but the peculiar climate. When digging up the prairie soil, even in the hardest clays, I could never get below the roots of grass, and these were so numerous that they seemed to fill the soil. Owing to the severe winter's frost, and the light rainfall in spring, the young roots are enabled to penetrate the soil to a depth wholly beyond the belief of an eastern farmer. They seem to follow the pores opened by the frost right into the subsoil, and hence, instead of drawing their nourishment from four or five inches of soil, they draw it from eighteen to twenty-four inches."

The great plain south of Battleford is not easily described, except in general terms, owing to its immense size and changing character. Coming from Battleford I found excellent grass, plenty of good water, and a rich loam or clay soil until I passed some distance south of lat. 52°, and west

of the same Meridian. My assistant and myself noticed the change from a good strong clay, producing excellent pasture, to another clay covered with *Artemisia* and small *Cactus*, where the water was scarce and bad, and the pasture poor and dried up. On examination this clay proved to be the Cretaceous St. Pierre beds of Dr. G. M. Dawson's Boundary Survey Report, and contains remains of *Baculites* and other fossils, together with nodules of brown iron ore. This tract of bad land is principally confined to the section between 111th and 112th meridians and between the 51st and 52nd parallels. Except this region the Great Plain, as far as known, is not arid, but produces good grass, has generally abundance of water, and usually a good soil. This extensive tract is almost wholly without wood of any description. Not a shrub enlivens its surface, except occasional clumps of rose bushes (*Rosa blanda*) a few inches high, the western snow-berry (*Symphoricarpos occidentalis*), and the beautiful Silver berry (*Elæagnus argentea*). These could not be called bushes except on the ground of being woody. They are never seen more than three years old and hardly ever that. The coulée, in which Tramping Lake lies, is still partly wooded with poplar and maple, but except in this and a few other localities not seen by me, no wood exists.

Coulées are quite a marked feature of the plains, but do not appear to be a part of the present natural system of drainage. They seem to be of an earlier geologic time, other than being dry water-courses of the present, and here the few creeks, which carry off the surplus water, originate. The Qu'Appelle Valley is a well known instance; the valley in which the Red Deer Lakes lie is another. Crawling Valley between Red Deer and Bow Rivers is a third, and here on the Great Plains is a fourth, as Tramping Lake Coulée is said to be the head of Eagle Creek on the one side, and a stream emptying into Battle River on the other. As a rule, the lakes found in the coulées are salt, but this is easily

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accounted for, as their bottoms are always on the Cretaceous clay, and the springs near the bottom of the coulée are brackish likewise, while the springs nearer the prairie level contain good sweet water. All brooks found on the plains, although containing good water themselves, have saline soil along the sides of their valleys, and not unusually there are brackish lakes and marshes in these valleys.

Extending northwards from the vicinity of the Bear Hills, is a tract of broken country with deep coulées, salt lakes, and occasional sand hills, which seem to extend westward to Tramping Lake. Much of the soil, however, is very rich, and there are large tracts of farming land intermixed with small areas of a broken and stony character. Captain Palliser's remark as to the barrenness of this country can only apply to the absence of wood, as he speaks again, on page 84 of his Report, thus: "The buffalo were seen in great numbers," and that "the country was entirely barren," and again, on the same page, he says, "we found only a swamp containing miserable herbage, which had been cropped by the buffaloes and afforded very scanty pasture for our horses." Here again I presume that the barrenness is not produced by natural causes, but by artificial ones.

A perusal of my own journal and that of Mr. Wilkins shows that this region, although not everywhere suited for agriculture, possesses many fine tracts fit for the plough, and always good pasture. In the Pacific Railway Report of 1879, page 90, Col. MacLeod well describes the section he saw. He says: "The whole country is a high rolling prairie, with gravelly ridges running in every direction. Grass of varying quality is to be found everywhere, and water varying with the season." Captain Dalrymple Clarke, in the same Report, says: "I should call the Great Plains a fine grazing country; in many places the traveller comes across buffalo or bunch grass. This grass is most nutritious and always preferred to other grass by both horses and cattle." With the

statements of these gentlemen, I entirely agree, and, furthermore affirm, that as this same region was the winter home of the buffalo, so in the near future it will be the winter home of immense herds of cattle, which can exist, as *they* did, by going on to the wind swept hill tops for nutritious food, when the poorer grass of the valleys lies covered by a mantle of snow. Water for cattle no more than for buffalo is needed in winter, as there is always snow enough among the grass to meet their wants. After the first of October our horses went to the hill tops for good grass, and I found on examination that they always cropped the northern buffalo grass (*Stipa spartea*) or if the hill was very dry, the southern one (*Bouteloua oligostycha*). I must emphatically deny the statements made imputing barrenness to this region, but I admit that running streams or cool springs are extremely rare. Wood is absolutely absent, and even a bush a few inches high is seldom seen.

The real cause of the absence of wood on every part of the region under consideration is undoubtedly prairie fires which sweep over almost every part of it year after year, destroying the seedling trees as long as there are any seeds left to germinate, and year by year killing the bushes until the capacity of the root to send up shoots dies out, and then even willows cease to grow. Would any person affirm that willows could not grow on the margin of the ponds where such plants as *Polygonum aquaticum*, *Potamogeton perfoliatus* and *gramineus*, *Utricularia vulgaris*, *Alisma Americana*, and *Sagittaria variabilis* could grow and flourish? And yet the first four of these were found in scores of ponds, and any botanist knows that these require permanent water. It was so moist on the plains that Cacti could not exist, but one could hardly walk through the Red Deer River Valley for them. While on the plains not a bush could be seen, yet in the valley, only a few yards from the Cacti, trees three feet in diameter stood.

Palliser states that the southern sides of all valleys were much moister than the northern, and that the southern slopes of all hills were without wood, and deduces from this the aridity of the climate. I am inclined, with all respect, to differ from Captain Palliser in this conclusion. It only proves that a surface inclined to the sun will naturally become dry, while one inclined from it will retain its moisture. When fires come on the plains the dry side of the hill is soon denuded, while the moist side is left intact. The inference is plain. If aridity is the cause of the absence of wood, how is it that the sand hills at the head of the Qu'Appelle, where the ground is certainly dry, are covered with it? The Bad Hills to the northwest of Red Deer Lakes, have wood likewise, while the Bear Hills to the north, which contain no sand, are without even a bush. The sand hills, observed by Mr. Wilkins and myself in the centre of the Great Plain, have brush in some quantity, while on good soil none exists. Finally, there is not a series of sand hills throughout the country, no matter how poor the soil, but what has either wood or brush, while immense tracts of first class soil is without a bush. The rich soil with its abundance of grass affords, when dry, fuel for the flame which destroys any seedling that may spring up; at the same time the sand hills, being unable to carry fire through their extreme poverty, keep it alive.

Sand and aridity are popularly classed together; but it should rather be sand and unfruitfulness. The impervious clays are arid throughout the regions explored by me. A comparatively small tract, commencing at Red Deer River, east of Blood Indian Creek, about the 111th Meridian, extending northwesterly to near the 52nd parallel, and thence west to the Red Deer River, south of the Squirrels Head, is largely a region of impervious clays, and this was the worst tract seen by me or my assistant during the summer of 1879. Much of this tract is without drift, and the Cretaceous clays

come to the surface, causing aridity, and producing alkaline swamps (white mud swamps), ponds, and lakes in abundance.

The Hand Hills and their eastern extension are like an oasis in this unpromising region, for surrounding them on every side is the hard baked clay of the St. Pierre beds. The only soil throughout the region explored which would not naturally produce timber are these Cretaceous clays, well worthy the name "Bad Lands."

I therefore maintain that the aridity, where it exists, is the result of soil and not of climate. Palliser, on page 11 of his Report when referring to this region, makes two statements corroborative of this. Describing the valley of the South Saskatchewan Palliser says:—"Even on the alluvial points in the bottom of the valley, trees and shrubs only occur in a few isolated patches. The steep and lofty sides of the valley are composed of calcareous marls and clays that are baked into a compact mass under the heat of a parching sun. Sage and Cactus abound, and the whole of the vegetation bespeaks an arid climate." Eight lines below this on the same page he says:—"In the midst of the arid plain traversed by the South Saskatchewan, there are isolated patches of table land upon the surface of which the vegetation becomes luxuriant, and pasture of a fair quality may be found. The expedition spent two weeks at the Hand Hills, which form one of those patches, for the purpose of recruiting the horses."

Here the natural order of things is reversed, and aridity is in the valley and luxuriance on the hill-tops. Why is this? Not because of climate certainly, but on account of soil. All the arid spots, all the salt lakes, and the brackish marshes of the entire plain, were traced to one cause—the Cretaceous clay.

Artemisia cana seems to be almost peculiar, on our plains, to the Cretaceous clay, and in the north the Cactus can only find on the clay the aridity of soil that is suited to its wants.

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The vegetation of these clays when dry outside of stream valleys, was characterized by numerous species of *Artemisia*, and many *Compositæ*, which in the north preferred salt lands. In Red Deer River Valley, *Cacti*, *Artemisia*, and various *Chenopodiaceæ* vied with each other in luxuriance, while grass and the more useful herbaceous plants were almost entirely absent.

Lying southwest from Battleford is a fine rich country which is reached about six miles from that "city." The country is almost a perfect level of good clay loam without a bush to break the monotony of the waving grass to the south. A fine rich country extends to the west from Battleford for at least eighty miles. It is generally level and often for many miles without a twig. In the vicinity of Manito Lake, there are large quantities of wood, and consequently there is broken country with numerous ponds and marshes.

Sounding Lake is a sheet of brackish water about seven miles long and four miles wide, surrounded on its north, east, and south sides with wood, the poplar averaging about six inches in diameter. South of the lake, as far as could be seen, nothing met the eye but conical hills. Between Sounding Lake and the "Nose" the country is hilly, but contains good pasture, wood, and water. The hills generally have a black loamy soil, while the valleys are principally clay or clay loam. Along the north of the lake the country is sandy, extending about six miles to the east where heavy clay with rich grass is met with. The wood ceases as soon as the sand is left. South of this line of travel a series of hills was seen, doubtless a continuation of those over which we crossed before reaching Sounding Lake.

The Neutral Hills lie northwest of Sounding Lake. Generally they are mere ridges of broken, more or less wooded, country with clumps of small aspen scattered over their surface where protected from fire by either water or sand. Stretching southwest from this point and extending to Tail

Creek is a wide tract of broken country well suited for stock raising and supplied with abundance of wood and water, both being found of excellent quality in the ravines and narrow valleys opening into Battle River. Sullivan's Lake, a large sheet of fresh water lying about the middle of this section, has much good land around it, but the greater part of this land is best suited for pasturage as it is much cut up by cou-*lées* and sharp or rolling hills.

Lying still further west and between Battle and Red rivers is a tract of fine rich agricultural land that has no superior in the North-West. Still further west is a large district lying around the head of Battle River and southwest towards Red Deer River, where millions of tons of hay grow every year owing to the richness and moistness of the soil. This region though wet is well suited for stock, as the natural grasses are of the very best quality, and shelter is to be had close at hand.

The region embraced in this chapter contains a large amount of prairie and forest lands all of the very best description. Rivers and small streams are found in almost every part, and many lakes abounding in fish of excellent quality are dotted over the surface. West of the Porcupine Mountain many beavers are yet trapped in winter. Little game, other than birds, of which there are myriads every spring and fall, is to be found in the country. Bears and wolves are occasionally met with, but no injury to either person or stock is ever done by them.

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CHAPTER VII.

Description of the Country Drained by the North Saskatchewan and Athabasca Rivers.

Extensive District South of North Saskatchewan—One Solid Block of 13,000,000 Acres—Large Area of Fertile Land North of River—Star Mission, its Success—Multitudes of Whitefish—Lac La Biche Mission—Farming at the Lake—Wheat, Barley, &c.—Victoria Mission—Small-pox Ravages—Rev. George McDougall his Death, the Edmonton Pioneer—Former Lawlessness at Edmonton—Change Caused by the Police—Edmonton, its Mills, Churches, Store—Coal and Iron at Edmonton—Review of the Country—Ninety-six per Cent. Good Soil over a Vast Area—Lands for the Irish without Rent—St. Albert Mission, its History and Success—Catholic Missionaries, their Work and Success—Rocky Mountain House, Fine Timber—Gold Washing—Beaver River, very Rich Land—Green Lake, Abundance of Fish—Chipewyan Indians—Athabasca River and Country—Size of the River and its Tributaries—Little Slave River—Pembina River, Coal in its Banks—The McLeod—Baptiste's River—Jasper House and Valley—Climate of the Valley, Snow Fall very Light, Warm Winds, Dry Climate, Spring Weather—Horses Living out all Winter—Source of Warm Winds—Fertile Belt—Richness of It—Where Located—Prairie still Better—Wet Lands—Summer Frosts—Late Sowing—Fall Sowing, its Success.

NORTHWEST from Battleford, south of the North Saskatchewan, the land is rather poor and sandy for fifty miles, but proceeding northwestward beyond this into the valley of the Vermilion River, the soil gets very rich and continues so all the way to Edmonton, a distance of over 200 miles. After leaving Battleford and reaching the meridian of Fort Pitt, the whole country between the North Saskatchewan on the north and Battle River on the south, and for thirty miles beyond Edmonton on the west, may be described as fertile and well suited for settlement. Much of it is so extremely rich, and the exuberance of its vegetation so great, that travellers have extolled it possibly beyond its merits, as large tracts of it are wet and bushy, and, probably, subject to summer frosts. Of that portion south of the telegraph line this cannot be said, as it is generally level, and for the most part with but little water on the surface. This tract is

unsurpassed in the North-West for its capacity to grow wheat as the soil is rich, the surface is almost level, and what slope there is inclines to the south. The great area described above, containing not less than 13,000,000 acres, is yet without inhabitant, except the settlements in the vicinity of Edmonton.

North of the Saskatchewan is a fine country, commencing a little east of Prince Albert, and extending westerly to Lac St. Ann's, fifty miles west of Edmonton. Owing to the southern bend of the river this tract varies in width from forty to one hundred miles. Throughout the whole of it the soil is warm, containing both sand and gravel, but, nevertheless, is generally rich and very fertile. It has likewise a southern aspect, and will therefore be free from frost in summer.

About fifty miles north of Carlton the "Star Mission," in connection with the Church of England, is situated. This Mission was established in 1874, and placed in charge of the Rev. Mr. Hinds, who, besides being a minister, was a practical farmer. He at once commenced to teach the old men farming and the children English, and in less than one year had a number of small farms commenced, and the children well advanced in the knowledge of English. Since then he has been very successful, and in 1879 Mr. O'Keeffe, D.L.S., writes of the Mission: "At Sandy Lake the Indians under the supervision of the Rev. Mr. Hinds, Church of England Missionary, were cultivating successfully fine fields of grain and raising vegetables." Of the country in this vicinity the same writer says: "No finer country could be desired than the section above described. The water is pure and abundant, and the land extremely rich. Pea vine, vetches, grasses, and, in fact, all herbaceous plants were luxuriant. Very fine fish are in all the lakes and rivers of the section; the whitefish being extremely abundant, large, and of fine quality. The timber on this section is not so good as that

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either east or west of it, but many groves were scattered through it.

"In the northwestern part of it the land is very good, but the timber is not of large size, being nearly all second growth, as the old timber had been burnt down some years before. The whole section may be classed as level plain, or gently rolling land, no hill being seen higher than fifty feet, except in the vicinity of the Mission. The land generally is a rich loam, with a small percentage of gravel, which indeed is the prevailing character of the soil for many miles. Spring wheat at the Mission, the best I have seen, was fit to harvest August 20th, 1879."

Two hundred and fifty miles northwest of the Star Mission is Lac la Biche, where a Roman Catholic Mission has been established for many years. Long before railways were talked of, the Fathers at this Mission had brought in a grist mill, worked by horse power, and here in Lat. 55° wheat was being grown and ground, into flour long before the value of the Red River Valley became apparent to Canadians.

Marcus Smith, C.E., thus speaks of the Mission: "Lac la Biche is 304 miles from Carlton. Mr. Trail, Hudson's Bay Company's officer at this post, stated that there were about forty families settled on this lake, principally Half-breeds and French Canadians. The Catholic Mission is on the lake shore, about nine miles northwest of the Post; here I met Bishop Farand, from whom much valuable information was obtained concerning the country to the north and west.

"Barley and wheat thrive well here, and also vegetables. There is a grist mill near the Mission. Abundance of whitefish are in this and the neighboring lakes. The timber of the country is spruce, poplar, and tamarac, all of good size. The divide between Beaver River and the Athabasca watershed is not more than three miles from Lake la Biche."

The Victoria and Whitefish Lake Missions are under the

control of the Canada Methodists, and around each quite a settlement has been formed. In 1871 these Missions were in a very flourishing state, but an outbreak of small-pox devastated the settlement, and when the writer visited the country in 1872, only the chimneys of the houses remained standing. Their occupants were either dead or scattered to the four winds.

The Rev. George McDougall, the pioneer Missionary to these parts, lost a daughter at this time, and he told me that the Blackfeet lay around for days waiting a chance to kill him or his wife, because they thought he had brought the calamity upon the country. God mercifully preserved him at that time, but in the winter of 1875 he perished miserably while visiting the Mission at Morleyville then in charge of his son John. On this Mission he had set his heart, and when the writer first saw him in 1872 he told of the wonders of the Bow River country, and prophesied its future greatness. In 1872 his house was the only one outside the Fort at Edmonton, and lawlessness was so common, even amongst the semi-civilized Indians around the fort, that murders were of frequent occurrence. A month or two before my visit an Indian, from some unexplained cause, became angry with his wife and attempted to kill her with a knife, but she fled from him. He pursued and overtook her, and stabbed her to death a short distance from the fort. A relative of the woman when pointing out the spot where she died, asked with great earnestness when would law reach them, and I replied that it was then on its way in the person of Col. Robertson Ross, the Adjutant-General, who would set everything right. He came and the Mounted Police were sent out, and the murders then so frequent ceased.

This is Edmonton society as it was in 1872. The state of farming was very little better. Fully one-half of the ripened wheat was smut, and doubt prevailed whether the

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climate was at all suited for that grain. In 1881 Edmonton appears as a town and settlement of great importance. It has its regular agricultural shows, its balls, and its public exhibitions, where the inhabitants vie with each other in such matters as their exhibits, their agility, their personal attractions and refinement. Lawlessness has passed away, and although the stockade is still around the fort, the guns still in the bastions, and the great gate and wicket closed at night, the fear of Indians, like the buffalo, has passed away, and only the Hudson's Bay Company's officials recall the time, scarcely ten years since, when the Blackfeet and Sarcees made night hideous with their fearful yells and threatenings, on account of the cruel murder of two of their number under the very guns of the fort.

Edmonton is a general term applied to a district, but still there is a concentration of houses and places of business called by that name. The village is some distance below the fort on the north side of the river. The Church of England and Canada Methodists have each a church, and a Presbyterian Mission having been established, a church will soon follow. There are several stores well stocked with goods suitable to the country, the chief being owned by J. H. McDougall, John Brown, and P. Heinwick, each carrying a stock of goods worth from \$25,000 to \$30,000, including freight, which swells the cost of goods in this distant part of the country. Three grist and saw-mills grind all the flour and saw all boards necessary for the settlement, and nothing is wanting now except railway communication, or better steamboat service upon the river. Abundance of coal can be dug out of the river bank, and less than a mile above the fort there is a deposit of bog iron ore, which may prove valuable when properly examined.

We are now 890 miles by cart trail northwest from Winnipeg, and over this immense distance pits, four feet deep and twenty miles apart, have been dug, and a careful

examination of the soils shows that only about five per cent. of the whole distance is unfit for agriculture and classed as third class soils, when compared with those of Prince Edward County which is one of the most productive districts of Ontario. The extent of these fertile lands cannot be realized by any person reading the accounts published in newspapers or blue books, nor even in passing over the trails as these are only particular lines. But having traversed the country in every direction I am enabled to grasp their immensity, without realising in any appreciable degree their influence upon the future of the civilized world. Seeing millions of acres of arable lands lying without inhabitants in one part of the British Dominions, and learning that in another part people on the brink of starvation are murdering each other for the privilege of renting a potato garden, causes one to exclaim against the shortsightedness of Governments, in not assisting emigration, and on the other hand against the foolishness of people remaining where their normal state for generations has been and *will* be one of poverty.

Nine miles west of Edmonton is St. Albert Mission, the largest and most prosperous Mission settlement in the North-West. It is the seat of a Bishopric, having Bishop's palace, cathedral church, nunnery, and various other buildings, all of large size and well furnished. The Bishop's palace, as described by a late writer, is a magnificent building. "This is a handsome frame structure, eighty by thirty-two feet, three stories high, including a large attic, lighted by rows of dormer windows, besides a large and well-lighted basement." Père la Comb established the mission in 1858, when this was only an Indian and Half-breed camping ground. Nine years later he was succeeded by Père la Duc, who gave place to Bishop Grandin in 1871, and from that to the present time St. Albert has been the seat of a Bishopric, from which many eminent men have gone out to preach the glad

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tidings to the benighted Indian women, that, in the sight of the "Great Spirit," the woman is equal to the man, and by this means to stamp out polygamy and make marriage more respected. Throughout the whole North-West there have been no men, of any Church, superior in any sense to the Fathers with whom the writer has met in his numerous journeys both east and west of the Rocky Mountains. He looks upon their labors as having produced due respect for the marriage relationship, a proper regard for the Sabbath, and an earnest for peaceable conduct and upright dealings one with another, in every part of the country he has visited.

Lake St. Ann's may be said to be the present limit of available land on the old line of the C. P. R. Little farming is carried on. The whitefish fisheries constitute the most noteworthy industry. These were more highly valued in years gone by when people and dogs depended almost entirely on meat, but at present they receive little attention.

The Rocky Mountain House was formerly the frontier trading post on the borders of the Blackfeet country, and here the plain Indians came in all the splendor of their untutored savagery, and in days when Rum was king held their wild orgies in front of the fort. Since the advent of the police, and peace with the Crees, the Blackfeet roam and trade at will, and this fort has lost much of its importance as a trading post. This post is about 150 miles southwest of Edmonton, within sight of the Rockies and on the margin of the Saskatchewan. It is 3,195 feet above the sea, and the neighborhood is of very little value as a farming country. Splendid groves of spruce and even forests of the same tree are on the upper Saskatchewan and its tributaries, and here in future will probably be the headquarters of the Rocky Mountain lumbering companies.

Gold washing has been practised for many years in the vicinity of Edmonton, but in no case has success been

so marked as to cause any parties to leave off farming for the purpose of prosecuting it. That fine flour gold is deposited on the bars each year is certain, but where it comes from, or whether it exists in large quantities, is still a matter of doubt.

Beaver River flows in a valley parallel to the North Saskatchewan, from a point nearly north of Edmonton to the Meridian of Carlton, a distance in a straight line of nearly 300 miles. It turns north at Green Lake, 150 miles north of Carlton, apparently into a valley of which Green Lake is a part. When the Beaver river is high in spring, it fills Green Lake by means of a small stream connecting the two, but as its waters lower the current changes and the Lake begins to empty itself. The valley of Beaver River contains very rich land, but future experiments are necessary before wheat can be relied on as a sure crop.

Green Lake is about eighteen miles long by from one to two wide. It is surrounded on all sides by a very fine poplar or aspen forest. The soil is rich and the climate suitable for the growth of wheat. Beaver River and Green Lake, like all the northern rivers and lakes, are full of whitefish. Throughout all the northern forests the Chipewyan locates himself on the margin of a lake, builds himself a house, clears a potato patch, and sets his nets. A visit to these nets twice a day gives him his food the year round, and his potato patch in the fall, and a few bears furnish him with a change before winter sets in. When he retires to his winter hunting ground, near a lake, he sets his nets under the ice, and is still independent of four-footed game.

The Athabasca country is very little known, as it is all covered with forest and difficult of access. Much of it is wet, and that section through which the old C. P. R. line passes is very wet and marshy, and full of muskegs. These are veritable peat bogs being composed of the same material as the bogs of Ireland and Scotland.

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The Athabasca at Fort Assiniboine, northwest of Edmonton, is fully 300 yards wide, being rather larger than the Saskatchewan at this point and flowing in a wider and deeper valley. About sixty miles northeastwards from this place it receives the discharge of Little Slave Lake from the west. The valley of this river is generally level and the soil on either side of the stream seems excellent sandy loam, and where free from timber abounds in rich grass and pea vine. Ascending the Athabasca from this point the first river met with is the Pembina, a stream about thirty yards wide, flowing from the southwest. This stream rises further out on the plain than any other belonging to the Arctic basin. It is known to show large exposures of coal in many parts of its course of a quality much superior to that of Edmonton.

Proceeding still to the southwest we pass the mouth of the McLeod, a large stream one hundred yards wide. Here the banks of the Athabasca become 300 feet high. Below this stream a sandstone cliff 100 feet high, having a coal seam five feet thick, is passed. Proceeding still up stream we reach Baptiste's River, a tributary from the west which is ninety yards wide. On this stream there is abundance of fine timber of various species, the spruce as on all other streams, proving to be the best.

Jasper House is beautifully situated on an open plain, about six miles in extent within the first range of the Rocky Mountains. As the valley makes a bend above and below, it appears to be completely encircled by mountains which rise from 3000 to 4000 feet, with bold craggy outlines. The little group of buildings which form the "fort," has been constructed in harmony with the picturesqueness of the situation, after the Swiss style, with overhanging roofs and trellised porticoes. The dwelling house and two stores form three sides of a square, and these with a little detached hut constitute the whole of this remote establishment. The climate of this valley is remarkable and is worthy of a passing

notice. Mr. W. Moberly, C.E., who spent the winter of 1872-3 in the Jasper valley, twenty-two miles from the summit of the Rocky Mountains, says in his report to Mr. Fleming:—"The total fall of snow in the winter of 1872-3 at our depot in Jasper Valley, twenty-two miles east of the summit of the Yellow Head Pass, was two feet one and a half inches, and the greatest depth on the ground at one time was six and one-half inches. Jasper Valley from the Miette, and as far down the River Athabasca as I have been, viz., about forty miles below Jasper House, has a dry climate. With the exception of a few occasional drops, I never saw any rain. There were some spells of frost in November, and a continuance of very cold weather in December; it was cold in January, and four or five days in February; at other times during the winter the weather was comparatively warm, frequently not even reaching the freezing point. The winds that blow with much violence render Jasper Valley unpleasant in the winter; the northeast wind always brought cold, and the southwest warm weather.

"From the beginning of March to the 20th May, with the exception of a little snow on the 26th and 27th April, the weather was remarkably fine. This is the best season for field work as the flies do not make their appearance until the beginning of June. Comparatively speaking, the winter months in the district referred to are not as severe as at Toronto. To give an instance, I will mention that the pack animals (horses and mules) with the expedition, after an unusually hard season's work of about nine months duration, when they were very much worn out and nearly starved, after packing the supplies over the Rocky Mountains by the Athabasca Pass, the altitude of which is 6025 feet above the sea, and at a time when severe weather and snow storms were almost incessant,—the animals were turned out about the 20th January to shift for themselves, as we had no fodder for them. Not a single one of them died and they were

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all in fair condition when they resumed work the following March."

This exceptional climate is only found along the base of the mountains, because when Mr. Moberly started east in March, he found a moister and cooler climate in the valley of the McLeod as he moved in the direction of Edmonton. It is extremely probable, as he states in another part of his report, that the warm currents of air that cause this dry and warm climate at the head of the Jasper Valley, come up the valley of the Columbia, from the "Great Columbian Desert" east of Walla Walla and pass through the mountains by the Athabasca and Yellow Head Passes.

Although the country lying between Jasper Valley and Lac St. Ann's is supposed by many to be of little value on account of bog and marsh, later explorers show that this opinion is in part groundless, as Mr. McLeod, C. E., speaks in high terms of certain tracts on the McLeod and Pembina rivers which were before thought to be marshy.

The "Fertile Belt" of Palliser is that section of the arable lands which we have been describing in this and the preceding chapter. The opinions of Palliser were based on the vegetation alone, and where he met with prairie and short grass this he pronounced a desert, while he praised exceedingly the rich but moist lands lately denuded of forest. It is now known that the prairie lands are better suited for immediate settlement, and less subject to summer frosts, which prove so injurious to late sown grain on the more elevated and moister sections of the country. All the land on the Saskatchewan is not equally suited for agriculture, but there is no tract where there will not be continuous settlement, and when we speak of summer frosts and too much water and muskeg, and late harvests, we do not wish to be understood as being afraid of these, but only to state that these drawbacks exist.

All the wet land in the country can be very easily

drained, as there is plenty of fall. Even at present it is a question whether there is too much water in any part recently settled. There are summer frosts in some localities, and late grain has been injured, but in the year 1880 none was damaged that was sown before the 10th June. Surely this is late enough when seeding commences over the whole country by April 20th. For the last three years I have been recommending fall sowing as a sure means of escaping injury from frost. By fall sowing I mean seeding so late that germination will not take place before spring. This has been tried by Mr. Bannatine of Winnipeg, and he reaped his grain two weeks ahead of that sowed in the spring.

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CHAPTER VIII.

Peace River.

Position of the Lands Described—Area of the Region in Question—Character of Rocks and Soil—Its Composition and Disposition—Peace River Prairie—Location of Prairie—Sandy Soils along Athabasca—Origin of Peace River Prairie—Wonderful Vegetation—Climate of Peace River—Summer of 1879—All Sorts of Grain and Vegetables Mature—Ripening of Grain at Dunvegan and other Points—Depth of Snow—Setting in of Winter—Opening of Spring—Breaking up of the Ice—Difference in Climate of Valley and Plateau—Occurrence of Frost—Comparison of Temperatures—Peace River Spring as Early as in Manitoba—Cause of Exceptional Climate—Chinook Winds—Length of Day and Increased Sunlight give Warm Summers—Immunity from Grasshoppers—Description of Little Slave Lake—Ripening of Grain at this Point—Whitefish in the Lake—Abundance of Beaver—Climate Unchanged to the North—Soil of the Northern Plain—Ripening of Grain at Vermilion—Summer Climate of that Region—Milder Climate Farther North at Little Red River—Vicinity of Fort Chipewyan—Extraordinary Wheat on Poor Soil—Crops at Fort Simpson on Mackenzie's River—Climate and Crops at Fort Liard, Lat. 61°—Barley Ripens under the Arctic Circle—Farming on Peace River a Success—Lakes Teeming with Fish—Birds in Countless Flocks—Rocks of Peace River, Limestone, Gypsum—Abundance of Salt Bituminous Shales on Athabasca River—Tar Springs—Description of the River—Appearance of its Banks—Land Between the Athabasca and the Peace Rivers.

DR. GEORGE M. DAWSON, F. G. S., was sent out by the Dominion Government in company with one of the C. P. R. surveying parties in 1879, and spent the greater part of the summer in exploring the Peace River country, and the following extract is taken from his official report. I prefer giving his report to my own as he takes up the whole subject:

"The portion of the Peace River country, for which the exploration of last season enables pretty accurate general information to be given, may be considered as extending eastward from the Middle Forks of Pine River. West of this point, as already stated, the areas of fertile land are small, being confined to certain river valleys, which penetrate the foot hills of the Rocky Mountains and high plateau

attached to them. With this western limit, the region now to be described may be considered as bounded on the north by the fifty-seventh parallel, to its intersection eastward with the Peace River. Thence the boundary may be assumed to follow the Peace River southward to the mouth of Heart Brook, near the confluence of the Smoky River. Thence to run southeastward to the extremity of Lesser Slave Lake, to follow the western border of the hilly region lying to the south of the lake to the Athabasca River; thence to follow the Athabasca westward to the foot hills, and skirt-ing the foot hills to run northwestward to the first men-tioned point on Pine River.

"The tract included within the limits above given has an area of about 31,550 square miles, and by far the larger part of this area may be classed as fertile. Its average elevation may be stated as little over 2,000 feet, and this is maintained with considerable uniformity, for though the general surface slopes slightly from the north and south toward Peace River, the region as a whole may be consid-ered as a plateau through which the great gorge-like valley of the Peace has been excavated. This valley has in general a depth of 600 to 800 feet below that part of the plateau bordering it, with a width of two to three miles from rim to rim. Its tributary streams, at first nearly on the plateau level, flow in valleys of continually increasing depth as they approach that of the Peace River. Those from the southeastern portion of the region rise either in the Rocky Mountains, or near the Athabasca, the tributaries received by the latter stream from the north and northwest being—with the exception of the Batiste—quite inconsiderable in this part of its course.

"The ridges and hills by which this region is occasionally diversified, appear in all cases to be composed either of the generally soft rocks of the Cretaceous and Tertiary, or of arenaceous clays containing erratics, and representing the

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boulder clays of the glacial period. These elevations are generally slight, and with exceedingly light and gradual slopes, the scarped banks of the streams constituting much more important irregularities. These ridges, however, often resemble detached portions of a higher plateau, and spread widely enough to occupy in the aggregate a considerable area, of which the soil is not so uniform in character as elsewhere. With these exceptions, the soil of the district may be described as a fine silt, resembling the white silts of the Nechacco basin previously referred to, and not dissimilar from the loess-like material constituting the subsoil of the Red River Valley in Manitoba. This silt, at a short distance below the surface, is greyish or brownish in color, but becomes mixed superficially with a proportion of vegetable matter to a varying depth. It has evidently been deposited by a comparatively tranquil body of water not loaded with ice, probably toward the close of the glacial period, and has either never been laid down on the ridges and undulations above referred to, or has been since removed from them by natural processes of waste. As evidenced by the natural vegetation its fertility is great.

"West of the Smoky River, both to the south and north of Peace River, there are extensive areas of prairie country, either perfectly open and covered with a more or less luxuriant growth of grass, or dotted with patches of coppice and trees.

"The northern banks of the Peace River Valley are also very generally open and grassed, and parts of the Valley of the Smoky and other rivers have a similar character. The total area of prairie land, west of the Smoky River, may be about 3,000 square miles. The remainder of the surface is generally occupied by second-growth forest, occasionally dense, but more often open and composed of aspen, birch, and cottonwood, with a greater or less proportion of coniferous trees. Some patches of the original forest, however,

remain, particularly in the river valleys, and are composed of much larger trees, chiefly coniferous, among which the black spruce is most abundant. Handsome groves of old and large cottonwoods are also to be found in some of the valleys. Where the soil becomes locally sandy and poor, and more particularly in some of the more elevated parts of the ridges before described, a thick growth of scrub pine and black spruce, in which the individual trees are small, is found; and in swampy regions the tamarac is not wanting, but grows generally intermixed with the black spruce.

"East of the Smoky River, and southward toward the Athabasca, the prairie country is quite insignificant in extent, the region being characterized by second growth woods of the character just described, which, on approaching the Athabasca, are replaced by extensive and well-nigh impassable tracts of *brulé* and wind-fall, in which second-growth forest is only beginning to struggle up.

"Though the prairies are most immediately available from an agricultural point of view, the regions now covered with second-growth and forest, where the soil itself is not inferior, will eventually be equally valuable. The largest tract of poor land is that bordering the valley of the Athabasca on the north. This rises to an elevation considerably greater than most of the region to the north and west, and appears during the submergence to which the superficial deposits are due, to have been exposed to stronger currents, which have prevented the deposition of the fine silt, causing it to be replaced by a coarser silt which passes in places with actual sand, and alternates with ridges of boulder clay. This region is also often very swampy, and for a width of twenty to twenty-five miles on the trail from Sturgeon Lake to the Athabasca is quite unsuited to agriculture, though still in many places capable of yielding good summer grazing when the forest has been completely removed by fire. To the northward, more particularly to the east of

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Smoky River, peaty and mossy swamps occupy part of the surface, and these may be regarded as permanently unsuited to agriculture.

"There is also a sandy tract, though of small width, along the lower part of the Elk River near its junction with the Smoky. Deducting, as far as possible, all the areas known to be inferior or useless, with about 20 per cent. for the portions of the region under consideration, of which less is known, the total area of land, with soil suited to agriculture, may be estimated as at least 23,500 square miles. In the absence of complete maps, such an estimate cannot be otherwise than very rough, but may serve to give some idea of the fact.

"Whatever theory be adopted, and may have been advanced, to account for the wide prairies of the western portion of America further to the south, the origin of the prairies of the Peace River is sufficiently obvious. There can be no doubt that they have been produced and are maintained by fires. The country is naturally a wooded one, and where fires have not run for a few years, young trees begin rapidly to spring up. The fires are, of course, ultimately attributable to human agency, and it is probable that before the country was inhabited by the Indians it was everywhere densely forest-clad. That the date of origin of the chief prairie tracts now found is remote, is clearly evidenced by their present appearance, and more particularly by the fact that they are everywhere scored and rutted with old buffalo tracks, while every suitable locality is pitted with the saucer-shaped "buffalo wallows." It is reported that a few buffaloes were seen last year near Pine River, but the animal has now become in the Peace River country practically extinct; an event which, according to the Indians, happened at a date not very remote, owing to a winter of exceptional severity, during which the snow 'reached to the buffaloes' backs.'

"The luxuriance of the natural vegetation in these prairies is truly wonderful, and indicates, not alone the fertility of the soil, but the occurrence of a sufficient rain-fall. The service berry, or *amalanquier*, and the choke-cherry, are very abundant in some places, particularly on the so-called Grande Prairie, which constitutes the great berry gathering ground of the Indians.

"With regard to the climate of the Peace River country, we are without such accurate information as might be obtained from a careful meteorological record, embracing even a single year, and its character can at present be ascertained merely from notes and observations of a general character, and the appearance of the natural vegetation.

"It may be stated at once that the ascertained facts leave no doubt on the subject of the sufficient length and warmth of the season to ripen wheat, oats, and barley, with all the ordinary root crops and vegetables, the only point which may admit of question being to what extent the occurrence of late and early frosts may interfere with growth. This remark is intended to apply to the whole district previously defined, though it must be remembered, in considering the subject, that the conditions of places situated in the bottom of the trough-like river valley, and 600 to 800 feet below the plateau, may be considerably different from those of its surface.

"The summer season of 1879 was an unusual one, characterized by excessively heavy rain-fall, with cold raw weather in the early summer months. These conditions did not extend to the west of the Rocky Mountains, but appear to have been felt over the entire area of the plains to the Red River Valley. As a result of this, the crops generally throughout the North-West were later than usual, and the mean temperature of even the latter part of the summer appears to have been rather abnormally low. Notwithstanding this, on my arrival at Dunvegan, on the 16th

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of August, small patches of wheat and barley in the garden of the fort presented a remarkably fine appearance, and were beginning to turn yellow. On my return to the fort on August 31st these were being harvested, their complete ripening having been delayed by overcast and chilly weather which prevailed between these dates. At the first mentioned date potatoes were quite ripe, with the balls formed on the stalk, and the garden contained also fine cabbages, cauliflowers, beets, carrots, onions, lettuce, and turnips. Dwarf beans, cucumbers, and squashes, were also flourishing, and though these plants are particularly tender, showed no sign of frost. The two last named having been sown in the open ground did not appear likely to perfect their fruit. A few stalks of Indian Corn were also growing, though it is improbable that this plant would ripen its seed in this district.

"When this garden was again visited on the last day of August, the beans, cucumbers, and squashes had been cut down by a frost, but not completely killed. The potato tops were also slightly nipped.

"Rev. M. Tessier, who has been at Dunvegan as a Missionary for some years, has always been able to ripen small, black butter-beans, but in some seasons not without difficulty owing to frosts. He has also tried a few grains of oats which he procured accidentally, and obtained a return of astonishing abundance. About the date just referred to the potato plants at Smoky River post (The Forks) were badly cut down by frost, the tubers being, however, quite ripe, fine and large.

"On the 15th September Mr. R. McConnell, my assistant, found the potatoes in the garden of the fort at the west end of Lesser Slave Lake, and on the level of the plateau, little affected by frost, with tubers large and ripe. Mr. H. J. Cambie also ascertained that wheat thrives at this place. We found some rude attempt at cultivation also

at the Cree Settlement, which consists of a few log houses built by Indians on the border of Sturgeon Lake, about seventy miles southwest of the west end of Lesser Slave Lake, and is at the average level of the country, with an elevation of about 2,000 feet. Here, on September 14th, the potato plants were slightly affected by frost, but not more so than observed with those at Dunvegan two weeks before. The tubers were quite ripe, but the Indians did not intend to dig them for about ten days. Turnips were very fine, and carrots, beets, and onions were good, though evidently cultivated with very little care. Two or three very small patches of barley had been almost completely destroyed by mice, but a few stalks remaining were quite ripe and with fine heads. The Indians here were very anxious to have a supply of garden seeds, which I have since been able to forward to them by the kindness of Messrs. Stobart, Eden & Co., of Winnipeg.

"At Fort St. John, ninety-five miles west of Dunvegan, and so much nearer the mountains, on July 26th, 1875, Professor Macoun states that potatoes, oats, barley and many varieties of vegetables were in a very flourishing state in "Nigger Dan's" garden. The oats stood nearly five feet high and the barley had made nearly an equal growth. The barley and oats were both ripe about the 12th of August. Professor Macoun was informed by Charlette at Hudson's Hope, thirty miles still further west, that in 1874 there was no frost from the 1st of May until the 15th of September. In 1875 sowing commenced the last week in April. There appears to have been a frost on June 28th, but the first autumn frost occurred on the 8th of September, and Mr. Selwyn found the potato tops still green in the middle of the month. Mr. H. J. Cambie saw wheat flourishing here in July last, but on his return in September it had been cut down by frost.

"Such are the notes that can be obtained on the growth of

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cereals and vegetables in the district in question. From information obtained at Dunvegan, it seems that the snow disappears about the middle of April, westerly winds sweeping it away fast. The river opens at about the same time. Cultivation begins at about the end of April or first of May. The river generally begins to freeze in November. The depth of snow, I was told, averages about two feet, an estimate which agrees with Mr. Horetzky's statement. Mr. Horetzky was also told that the plains were often nearly bare up to the month of December, though the winter usually sets in with the month November. Sir Alexander Mackenzie remarked the same absence of snow in the early winter months of 1792. It was entirely gone on April 5th, 1793, and gnats and mosquitoes were troublesome on April 20th. Horses almost invariably winter out well without requiring to be fed. Hay should be provided for cattle, to ensure perfect safety, for a period of three or four months, though in some seasons it is necessary to feed the animals for a few weeks only. The Indians of the "Cree Settlement" on Sturgeon Lake, previously referred to, winter their horses without any difficulty round the borders of a neighbouring lake, the shores of which are partly open. From Hudson's Hope the horses are sent southward to Moberly's Lake to winter, and according to Mr. Selwyn, do well there. Lesser Slave Lake, with its wonderful natural meadows, has long been known as an excellent place for wintering stock, and is referred to as such by Sir J. Richardson.

"Some general idea of the length and character of the seasons at Fort St. John may be gained by an examination of the extracts from the journals from 1866 to 1875, published by Mr. Selwyn. The dates of opening and closing of Peace River being an important clue to the mean temperature of the region, may be quoted as summarized by Professor Macoun in the same report (p. 156):

Ice breaking	Ice drifting first time.
1866, April 19th.....	November 7th.
1867 " 21st.....	November 8th.
1868 " 20th.....	November 7th.
1869 " 23rd.....	November 8th.
1870 " 26th.....	No record.
1871 " 18th.....	November 10th.
1872 " 19th.....	November 8th.
1873 " 23rd.....	November 4th.
1874 " 19th.....	October 31st.
1875 " 16th.....	

"The average date of the breaking up of the ice may thus be stated to be April 21st; that on which ice is running on the river for the first time, November 7th. In 1792 and 1793, when wintering at the mouth of Smoky River, Sir Alexander Mackenzie observed the ice to be running for the first time on November 9th, while the river was clear of ice on the 25th April. I have been unable to find any precise records of the dates of closing and opening of the Saskatchewan, but Dr. Hector states these are usually the second week of November and the second week of April respectively. The Saskatchewan is a more rapid stream than the Peace.

"With regard to the probable difference between the actual valley of the Peace and the plateau forming the general surface of the country, Professor Macoun observes, speaking of the vicinity of Fort St. John, that notwithstanding the difference in altitude the berries on the plateau ripened only about a week later than those near the river, while he was informed that there was about the same difference in the time of disappearance of the snow in spring. While at Dunvegan I ascertained that a similar difference was observed there, but it was added that this obtained chiefly with the wooded parts of the plateau, the snow disappearing on the prairies much about the same time as in the valley. In my diary, under date September 5th, I find the following entry: 'Aspens and berry bushes about the Peace River Valley now looking quite autumnal. On the plateau

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800 or 900 feet higher, not nearly so much so. Slight tinge of yellow only on some aspen groves.' This difference, though not altogether constant and depending much on diversity of soil, appears to be actual. In October, 1872, Mr. Horetzky writes: 'We observed that, curiously enough, the vegetation upon these uplands did not appear to have suffered so much from the effects of frost, this being probably due to the fact of the air in these upper regions being constantly in motion, while in the deep and capacious valley of the river the winds have often no effect.'

"The difference between the valley and the plateau being thus very small, I have not treated separately the observations for temperature taken by myself in the different situations. Most of the observations, however, refer to the plateau, and including the whole time spent in the country, from the Middle Forks of Pine River to the bank of the Athabasca, cover a period of nearly two months. The mean minimum temperature for the month of August, deduced from observations extending from the 6th to the 31st of the month, is 39.9° . The mean of observations at 6 a.m. during the same period is 42.3° ; that of the observations at 6 p.m. 59.5° . In September the mean minimum temperature was 28.1° . The mean of morning observations 34.3° ; of evening observations 51.5° . I have endeavored to deduce from these observations mean temperatures for the months in question, by correcting them by the tables of hourly variations in temperature given by C. A. Schott in the Smithsonian Contributions to Knowledge (No. 277), but find it impossible to do so, as the daily range is here so much greater than that of any of the places represented by the tables, which refer chiefly to the eastern portion of the continent. It would appear that while in most places the mean temperature of the day is reached about 8 p.m., it is found in the Peace River country not far from 6 p.m., by reason of the increased rapidity of loss of heat by radiation

due to greater elevation and drier atmosphere. The maximum temperature was seldom observed, but the daily range was very great, and the maximum probably several times reached 80° in August, and often surpassed 70° in September.

"From the 6th to the 31st August I registered two nights of frost, on the 13th and 20th of the month when the thermometer showed 32° and 26° respectively. Both of these were observed on the plateau, but one at least of them (that of the 20th) must have occurred also in the valley, from the effects produced at Dunvegan on tender vegetation. These frosts occurred in very fine weather, following a day of strong westerly wind, the result of which is to remove from the surface of the earth the whole of the lower heated layer of the atmosphere. This, succeeded by a calm and cloudless night with transparent sky, causes the thermometer to sink below the freezing point before morning. When not preceded by strong wind, mere transparency of the atmosphere seems seldom or never to lead to frost in August in this district, as many beautifully starlight nights, without an approach of the mercury to freezing-point, were observed

"Though in some cases such frosts as these may be general, and extend over a wide district of country, it is more usually found that they are quite local in character. A few floating clouds, or light wreaths of mist, may arrest radiation so far as to prevent frost over the greater part of the country, while some spot accidentally exposed during the whole night under a clear sky experiences a temperature below 32° . The contour and character of vegetation of the country also have much to do with the occurrence of frosts, and it is very frequently the case that river valleys are more subject to frosts than the upland districts. During the month of September, in a region for the most part wooded, and often above the average altitude, between Dunvegan and the Athabasca, nineteen frosts were regis-

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tered, the actually lowest temperature being 20° on September 18th.

"Through the kindness of Colonel Jarvis, of the North-West Mounted Police, I have been able to secure a copy of records kept by Dr. Herkomer, of Fort Saskatchewan, on the Saskatchewan River, about twenty miles northeast of Edmonton. For comparison with the observed temperatures in the portion of the Peace River country now discussed, they are invaluable; for in the whole district surrounding Fort Saskatchewan and Edmonton, we now know from actual and repeated experiment that wheat and all other ordinary cereals and vegetables thrive, and yield most abundant crops. The climate in its great diurnal and annual range, corresponds exactly with that of the Peace River country. Fort Saskatchewan is situated on the brow of the Saskatchewan Valley, about seventy feet above the river, and therefore probably less liable to frosts than either the bottom of the river valley or extensive flat tracts of plain, where there is little circulation of air. This, with the position of the thermometers in regard to the buildings, leads to the belief that if at all in error, as representing the climate of the region generally, the indicated temperatures are slightly too great. The thermometer appears to have been read in all cases to the nearest degree only.

"A comparison may be made between the temperature observed in the Peace River country during August and September, with those at Fort Saskatchewan, as follows:—

Peace River Country, mean of minima during August,	39.9°.
" " " " " " " " " " " "	September, 28.1°.
" " " " " " " " " " " "	Frosts experienced during August, 3.
" " " " " " " " " " " "	September, 19.
Fort Saskatchewan, mean of minima during August,	39.3°.
" " " " " " " " " " " "	September, 31.1°.
" " " " " " " " " " " "	Frosts experienced during August, 0.
" " " " " " " " " " " "	September, 15.
" " " " " " " " " " " "	mean of maxima for August, 77.8°.
" " " " " " " " " " " "	September, 6.81°.
" " " " " " " " " " " "	temperature of August, 58.6°.
" " " " " " " " " " " "	September, 45.4°.

"The mean of maxima and actual mean temperature for the month cannot be stated for the Peace River country. The actual mean for Fort Saskatchewan is obtained by adding the minima and maxima for each month together, and is probably very nearly correct.

"While regretting that the data at disposal for the determination of the agricultural value of the Peace River country are not more ample, we may, I believe, arrive with considerable certainty at the general fact that it is great. From such comparison as can be made, it would be premature to allow that the climate of the Peace River is inferior to that of the region about Edmonton or the Saskatchewan. It is true that in both the Saskatchewan and Peace River districts the season is none too long for the cultivation of wheat, but if the crop can be counted on as a sure one—and experience seems to indicate that it may—the occurrence of early and late frosts may be regarded with comparative indifference. The season is at least equally short throughout the whole fertile belt from the Peace River to Manitoba, though early and late frosts are not so common in the low valley of the Red River. The almost simultaneous advance of spring along the whole line of this fertile belt is indicated by the dates of the flowering of the various plants, a point referred to by me in some detail elsewhere. It is further unquestionable that the winter is less severe, and not subject to the same extremes in the Peace River and Upper Saskatchewan regions as in Manitoba.

"We have already found reason to believe that the early and late frosts, and not the absence of a sufficient aggregate amount of heat, constitute the limiting condition of wheat culture in the North-West; but that neither the Saskatchewan nor the Peace River countries lie upon the actual verge of the profitable cultivation of wheat appears to be proved by the fact that oats succeed on the Saskatchewan, and also—in so far as one or two seasons can be accepted as evidence

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—on the Peace River; while it is well known that this cereal is less tolerant of summer frost than wheat. This is further proved by the fact that at Fort Vermilion and Athabasca Lake, 180 and 300 miles respectively northeast of Dunvegan, Prof. Macoun found wheat and barley ripening well; but in this instance the fact is complicated by the circumstance of the decreasing altitude of the country which introduces a new condition. As no knowledge has been gained of this country on the Lower Peace in addition to that collected by Prof. Macoun in 1875, it is not included in the above discussion, though from it additional great areas might doubtless be added to the fertile tract.

“Referring to the journals kept at Fort St. John, Mr. Selwyn, in the report already several times referred to, comes to the conclusion that the climate of the Peace River compares favorably with that of the Saskatchewan country, or Montreal.

“It has often been stated in a general way that the cause of the exceptionally favorable climate of the Saskatchewan and Peace River countries, as compared with those of the eastern portion of the American continent, is to be found in the prevalence of warm westerly winds from the Pacific. Sir Alexander Mackenzie speaks of these westerly winds in winter, writing: ‘I had already observed at Athabasca that this wind never failed to bring us clear mild weather, whereas, when it blew from the opposite quarter, it produced snow. Here it is much more perceptible, for if it blows hard southwest for four hours a thaw is the consequence, and if the wind is at northeast it brings sleet and snow. To this cause it may be attributed that there is so little snow in that part of the world. These warm winds come off the Pacific Ocean, which cannot, in a direct line, be very far from us, the distance being so short that, though they pass over mountains covered with snow, there is not time for them to cool.’

"Farther south these southwesterly currents are known as 'Chinook Winds,' and similar consequences are observed to accompany their occurrence. Sir Alexander Mackenzie, however, in the summer of 1793, found the distance to the Pacific coast from his wintering place, at the mouth of Smoky River, greater than he appears to have imagined at the time he penned the above quoted remarks, and it is difficult indeed to understand how currents of air, blowing for at least 350 miles across a country which is for the most part mountainous, should retain enough warmth to temper effectually the climate of the plains to the east. This difficulty would appear to be particularly great in summer, when the mountains are largely snow-clad, and the mean temperature of the Peace and Saskatchewan Valleys, is probably considerably in excess of that of the region intervening between them and the sea.

"In addition to the favorable climatic conditions indicated by the thermometer, the length of the day in summer in the higher northern latitudes favors the rapid and vigorous growth of vegetation, and takes the place, to a certain extent, of heat in this respect. This has been supposed to be the case from the luxuriant vegetation of some northern regions, but Alphonse de Candolle has put the matter beyond doubt by subjecting it to direct experiment. In latitude 56° , which may be taken as representing that of much of the Peace River country, sunrise on 21st June occurs at 3h. 12m., sunset at 8h. 50m.; while six degrees further south in latitude 50° , which may be assumed to represent Manitoba, sunrise occurs on the same day at 3h. 49m., sunset at 8h. 13m. The duration of sunlight, in the first case, is 17h. 38m.; in the second, 16h. 24m., or one hour and a quarter in excess in the northern locality. This excess of course decreases to zero at the spring and autumn equinoxes, and the difference is reversed in the winter.

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and that on the upper part of the Saskatchewan, other things being equal, a value as farming land acre for acre considerably greater than that of most parts of the North-West, is the immunity of this region from the visits of the devastating locust or grasshopper (*Caloptenus spretus*). I have elsewhere discussed the question of locust invasions, in several papers, and it has since been taken up by the United States Entomological Commission. It must suffice to state here, that while a long series of years may pass without the occurrence of serious invasions, these must continue always, or at least for a very long time, to constitute a drawback to the whole territory lying south of a line drawn about sixty miles south of Edmonton, and thence nearly following the border of the wooded country eastward and southward to Manitoba."

Little Slave Lake lies nearly east and west. It is about seventy-five miles long, with an average breadth of about five miles. The south shore is low and marshy. Extensive marshy meadows are around the southwestern extremity, but owing to willow thickets their extent is unknown. South of the lake the country is hilly, some of the hills even rising into mountains, but to the north the country becomes level and is said to pass into marsh some distance from the lake. Vegetables in abundance are raised at the Post, and wheat and barley grow well but are seldom sown. Barley ripened here on August 12th, 1872, while at Edmonton the same year it did not mature until the 26th of that month.

Large numbers of white fish are caught in the lake, and in the surrounding woods moose are quite common, being indeed the chief food of the people. Many beaver are still to be found in the neighbourhood, and the Rev. Mr. Gordon reports that as many as 8,000 were obtained in the winter of 1878.

From the Rocky Mountains to very nearly Fort Simpson

in latitude 62° there is scarcely any difference in soil or climate, except that the latter improves as we recede from the mountains. Near Fort Vermilion, in latitude 58° 24', I found both soil and climate everything I could desire.

The soil here is of the very best description, evidently alluvial and of great depth. About half a mile from the river the land rises nearly fifty feet, with increased luxuriance of vegetation, although two degrees north of St. John barley and vegetables grow much quicker and ripen earlier than at that Post. Barley sown on 8th May was cut August 6th, having been on the ground just ninety days. Turnips and early rose potatoes were large with indications of heavy crops. The whole country around this point is a plain, elevated from fifty to one hundred feet above the river. From frequent enquiries regarding the character of the soil at a distance from the river, it is believed to be exactly like that seen at Vermilion. The country intervening between this and the Caribou Mountains seemed level or to slope gradually up towards the mountains, and as far as the eye could see was covered with aspen forest interspersed with a few groves of spruce. No frosts occurred from early in May to September 8th, 1875. Often whole seasons pass without frost from early in May to October. Peace River at this point is 3,000 feet wide.

At Little Red River, farther north, the climate seemed still milder, and if anything the soil richer. Cucumbers sown and ripened in the open air were seen August 15th, and all garden vegetables were ripe. Fort Chipweyan, at the west end of Lake Athabasca has comparatively poor soil in its vicinity, being largely composed of sand; still here I obtained fine samples of wheat and barley that took the bronze medal at the Centennial Exhibition, held in Philadelphia in the summer of 1876. The land is very low and swampy, being but little elevated above the Lake.

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informed me that barley always ripened there, and that wheat was sure four times in five. Melons, if started under glass, ripen well. Frost seldom does much damage.

Chief Trader McDougall says that Fort Liard, in latitude 61° north, has the warmest summer climate in the whole region. All kinds of grain and garden vegetables always come to maturity. He has been on the Youcan for twelve years, and says that in most seasons barley ripens under the Arctic circle in longitude 143° west.

The localities mentioned were not chosen for their good soil, but for their facilities for carrying on the fur trade or for Mission purposes. Five-sixths of the land on Peace River is just as good as the points cited, and will produce as good crops in the future. The reason so little land is cultivated is owing to the fact that the inhabitants—whites and Indians—are *flesh eaters*.

For three years the Rev. M. Garrioch has been farming at Vermilion, and has definitely settled the question of fertility and climate at that point. All kinds of grain ripen well and cattle winter as well there as anywhere else. The testimony of residents, and the meteorological observations which have been taken at Fort Simpson for a series of years, show that wheat can be successfully grown as far north as lat. 61°, and barley up to the 66th parallel, or under the Arctic Circle.

All the lakes of the north teem with fish of the very best quality,—whitefish and enormous trout are the principal. Geese, and ducks during the migrations are in countless thousands, and supply the whole population with food. At Fort Chipweyan many thousand geese are killed every fall and preserved for winter use. Not less than 25,000 dried white fish are required for the post every winter. Part of these is fed to the train dogs and the others serve as rations for the men when fresh fish are scarce. The seat of the fishery is at the Quatre Fourche River, a point where four



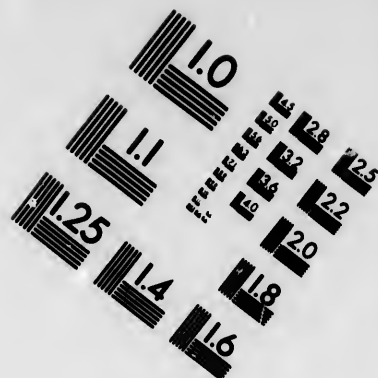
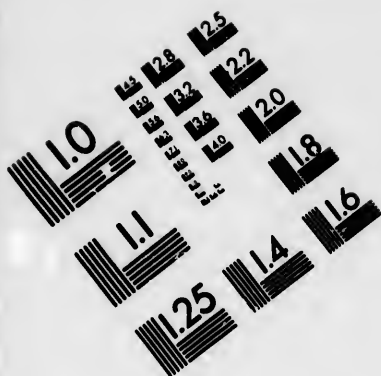
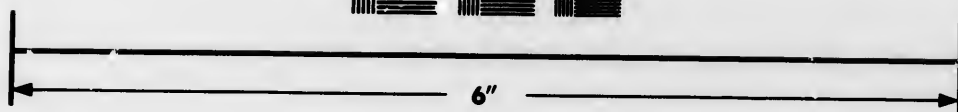
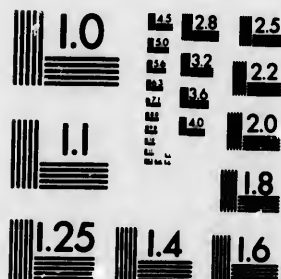


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rivers meet, about eight miles from the Fort. Here fish are caught every day in the year.

So little is known of the country between the Athabasca and Peace Rivers that I have not attempted to describe it. Rich soil, however, is known to prevail, but much of the land is reported marshy on account of beaver.

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CHAPTER IX.

Climate of the North-West.

Notes from Blodgett's Climatology—Its Great Value—Lake Superior Compared with North-West—Summer Heat Decisive of Climate—Thermal Lines Curve Northward—Spring opens Simultaneously on a Northwest line Between St. Paul's and Mackenzie Rivers—Deserts not Found North of Lat. 47°—Rain Sufficient on the Northern Plain—Buffalo more Abundant in the North—Peace River Compared with Germany and Russia—Canadian North-West the Better—A Prophecy Thirty Years Ago—Size of our North-West—Lord Selkirk's Opinions Seventy Years Ago—500,000 Square Miles with a Mild Climate.

THE region to which the following remarks will mainly apply is bounded on the south by parallel of lat. 49°; on the north by parallel of lat. 60°; on the east by meridian 95°; on the west by the line of the Rocky Mountains. An area, in round numbers, of 667,600 square miles.

For many years this vast region was almost a blank on our maps—little was known of it, either by Englishmen or Canadians, beyond the fact that furs were obtained therefrom. More than twenty years ago, however, Americans recognized its value, and foretold its great future and even described it as the prospective granary of the world.

In 1857 Capt. Palliser was commissioned by the British Government to examine the country south of the 54th parallel. Commencing his examination at the international boundary, in the vicinity of the Red River, he made a few traverses and reached Fort Ellice late in the season. Proceeding up the right bank of the Qu'Appelle to its head, he crossed the South Saskatchewan and proceeded northward to Carlton, where he wintered. In June, 1858, he turned southwest and spent the summer on the Great Plains, wintering that year at Edmonton. In the follow-

ing spring he again proceeded south to the boundary, but afterwards passed to the west into British Columbia.

He reported in very favorable terms of the northern portion of the country that he **had traversed**, but of the southern portion he spoke much less favorably—alleging that running water was very scarce; that no wood was to be seen except in the river valleys; and that, owing to the enormous herds of buffalo which covered the plains at that time, feed in many places was poor.

As far as public opinion was concerned the only immediate result of this exploration was that a certain district in the north became known as the "Fertile Belt," and that the southern part, about which so little was said, was set down, or assumed to be, arid and of slight value; an opinions till generally prevalent and mainly fostered by writers whose views have been based on a misinterpretation of Capt. Palliser's remarks.

The survey of the International Boundary and the establishment of the Mounted Police Force in 1874, tendered in some degree to dispel the cloud which hung over the south. Frequent journeys have done much since in the same direction, yet in the minds of the general public, and even of many others who should be better informed, the old prejudice, in a measure, exists.

In this case the past only repeated itself. How many are the instances of wealth unknown having remained for centuries under the eye of the dwellers on the spot, unappreciated and untouched?

In our day the growth of the Dominion, demanding a through communication from east to west, and the exigencies of the over-populated countries of the old world, have been the means of enlightening the world as to the extent of the resources of the "Great North-West," thus fulfilling the beneficent intentions of the all-wise Creator.

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and there dotted the new land, and the reports of one and the other only stimulate us to further research.

Amongst those sent out to explore, I was first commissioned by Mr. Fleming in 1872, to examine the flora of the prairies between Winnipeg and Edmonton. The same year I was despatched in company with Mr. Charles Horetzki, to explore the Peace River and examine the country on its banks. The journeys resulted in the discovery of the low passes through the Rocky Mountains, and of an extensive tract of fertile country, since known as the Peace River District.

In 1875, I accompanied Mr. Selwyn, Director of the Geological Survey, in the capacity of botanist, to British Columbia and from thence by the Peace River Pass to the east of the Rocky Mountains. Circumstances compelled me to descend the Peace River from the Rocky Mountains to Lake Athabasca, and I was thus enabled to see the country as far north as lat. 59°. Turning eastward at this point a journey of 1200 miles brought me to Winnipeg.

The general conclusions which I arrived at from my explorations of 1872 and 1875 were: 1st, That as there was but one flora common to the region extending from eight to twelve degrees of latitude, or as far north as 60°, and as that flora required a high summer temperature for its existence, the thermometer would be found to show a correspondingly even distribution of heat throughout the whole district. 2nd, That exceptional or special conditions must exist to produce that high and even distribution of heat discovered as ranging over so great an area.

These conclusions have since been established as facts by the recorded observations sent in from the Meteorological stations at Winnipeg, Fort McLeod, and Fort Calgary in the south, and Fort Rae and Fort Simpson in the north. (See Meteorological Report for 1878.)

In 1879 my attention was mainly directed to an investi-

gation of the causes of the supposed aridity of the district lying to the south. I found a parched surface, dried and withered grasses, and in short every appearance of the existence of such aridity; but closer examination showed that these indications were illusory. At the point "Blackfoot Crossing" lat $50^{\circ} 43'$ where the consequences of aridity appeared the strongest, I came upon ground broken up in the spring, bearing excellent crops of all kinds—oats being four feet high, while on the land outside the fence the grass was burnt up and all other vegetation withered. From this I argued that the rain-fall in the district was evidently ample for the requirements of vegetation, but that, until the baked crust was broken, it could not percolate the ground as rapidly as it fell and so a great portion was evaporated by the dry atmosphere and lost. Thus the apparent aridity vanishes before the first efforts of husbandry. Next to the question of aridity was that of the high and even temperature of climate. On this point I simply accumulated data bearing on the observations of former years, all of which tended to prove that the great plain to the northwestward, and north of lat. 49° extending along the Saskatchewan and other rivers between the 100th and 115th Meridians, and the narrow strip of coast north of Monterey, California, present decided features of difference from other districts of the American continent. These differences and peculiarities I shall now deal with *seriatim*.

TEMPERATURE.

It was long ago asserted as a principle by Geologists that "land in quantity situated to the southward of lat 40° north, very materially raises the temperature of lands lying to the north of such parallel." (Sir C. Lyell). To the expression "land in quantity," I would add, *when its character is that of a desert or arid nature*. Another maxim is thus laid down by a well known writer on American

Climatology (Blodgett) "that high arid plains are indicative of great summer heat, of an arid atmosphere, and of little rain or snowfall." Now the conditions required to test the accuracy of both these propositions are presented in the position occupied by the North-West Territory. South of our boundary, within the United States, lies a vast tract of land, generally arid or desert, of which at least 500,000 square miles are embraced in a plateau which has a general level of 6000 feet. At Laramie City in lat. 42° it is about 7000 feet above sea level, thence northward it rapidly falls off so that when it reaches our boundary in lat. 49° at Pembina, it is considerably under 1000 feet. At the base of the Rocky Mountains it is under 4000 feet. From the boundary the plain extends far to the north and only terminates at the Arctic Sea. In such a wide range of latitude it might well be expected that a considerable difference of temperature would be found. The following Table, however shows the temperature as being wonderfully uniform. (See Meteorological Report, 1878) :

PLACE.	LAT.	LONG. W.	JUNE.	JULY.	AUGUST.	MEAN OF SUM. MOS.
Winnipeg.....	49.53.....	97.07.....	59.2.....	65.8.....	63.3.....	62.8
Fort McLeod....	49.39.....	113.42.....	60.6.....	63.3.....	57.0.....	60.3
Norway House...54.00.....	98.00.....	54.9.....	63.5.....	61.2.....	59.9	
Fort Simpson...61.52.....	121.25.....	58.8.....	63.4.....	63.2.....	61.8	

In the same parallels of latitude in Europe the temperature is recorded as follows. (See Blodgett) :

PLACE.	LAT.	JUNE.	JULY.	AUGUST.	MEAN OF SUM. MOS.
Penzance, S. W. England.....	50.08.....	59.5.....	62.1.....	61.1.....	60.9
Cracow, in Poland.....	50.04.....	64.0.....	65.8.....	64.9.....	64.9
Koenigsberg, in Prussia.....	54.42.....	57.4.....	62.6.....	61.7.....	60.6
St. Petersburg, in Russia.....	59.56.....	53.2.....	62.7.....	60.8.....	60.6

We see that the summer temperature in the North-West Territories is exceptional. Believing, however, that in addition to the quoted causes, there are others which contribute to this result of exceptional temperature, I purpose for the present, to reserve the fact for further comment,

and pass on to the subject of isothermals. The recorded lines of equal temperature show that the various lines of heat, as they make westing from the eastern coast of the continent, tend in summer to curve upwards from the Gulf of Mexico in a northwesterly direction to a point in lat. 50° , long. 110° west. At this point the mean summer temperature is 70° F., while at Winnipeg, on the same parallel of lat., but 15° further east, the temperature is but 65° . Tracing these isothermals still further north, the line of greatest heat passes near Fort Vermilion in lat. $58^{\circ} 24'$ and long. $116^{\circ} 30'$ west. I may mention that at this point I found barley cut on August 6th, 1875, and wheat almost ripe. Still farther north and west the table shows that Fort Simpson has a mean summer temperature of $61^{\circ} 8'$ F. Turning to the west coast, the isothermal lines commence to turn northward from the Gulf of California, and for a time skirt the western side of the Rocky Mountains. On reaching the low point of the chain between lat 41° and 45° they turn to the east, cross the mountains, and strike the Dominion boundary on the 115th meridian. These westerly currents, named the "Chinooks" have been known to cause a rise in the temperature of 60° in a few hours. When in that country I enquired from a Half-breed about their effect on the snow. His reply was, "the Chinooks lick up snow, water and all."

After crossing the Rocky Mountains the thermometric current of the west meets that of the east at or about the Hand Hills in lat. $51^{\circ} 20'$, long. 112° . There, in 1879, I found that for days together, during August, the thermometer in the shade registered from 87° to 92° F. From the Hand Hills the united currents, following their resultant direction, carry the temperature of latitudes extending almost to New Orleans over the North-West, and confer on it the blessings of a climate, not only exceptional as regards character, but productive of results to the agriculturist,

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which, I believe, are unsurpassed in any other part of the world.

Returning to the course taken by the east and west currents before their union at the Hand Hills, it is a matter for consideration, why that from the east departs from the natural law which would give to it an eastward, in place of a westward bend, while the western current follows the natural law and bends to the eastward.

The answer to this question is *the key to almost every climatological peculiarity of the North-West.*

The data which we have for the investigation of the question: "Why does the eastern current of heat proceeding northwestward from the Gulf of Mexico bend to the west?" are:

1st. Recorded observations, which show that land of a desert character is heated to a greater degree than the land or water adjoining.

2nd. Recorded observations which show that currents of air are constantly on the move to where the land is most heated.

3rd. The fact that to the westward of the tract running northward from the Gulf of Mexico lies the "Great American Desert."

To my mind no argument is needed to show that the cause of the divergence of the eastern thermometric current to the westward is solely due to the position and effect produced by the American Desert. A confirmation of this inference is offered in the eastern hemisphere, where the Southeast Trade winds are drawn out of their course by the heated atmosphere of the Western Indies, and result in the Southwest Monsoon, and further by the northeastern trend of the isothermals in Northern Asia. In the transition from summer to winter we find the desert losing its temperature (terrestrial and atmospheric) and consequent attractive influence on air currents warmer than its own. The first

effect of this is that the isothermals pass away from their northern altitude and sink southward; next, when freed from the desert influences, they no longer trend to the westward, but to the eastward. On the withdrawal of the southern warm currents, other currents from the north and from the west follow them up, particularly on the east side of the Rockies, and establish the prevailing northwest winter winds, which being affected by the temperature of the Arctic regions on the one hand, and by the mountains on the other, bring the minimum line of cold far to the south. Were the American Desert an inland sea, the summers of our plains would lose their exceptional character, and our winters would be like those of Eastern Europe.

In a book like the present, however, it would be out of place to discuss the climate of the eastern hemisphere; but it could be shown that precisely similar causes to those which I have specified exist there, and are productive of the same results.

HUMIDITY.

The rainfall of the North-West offers as favorable a contrast to that of other districts as the temperature. Rains usually come just when they are wanted and cease when vegetation no longer requires them, and when their continuance would be detrimental to harvesting. Formerly the rainfall of a country was judged by the average for the whole year. Such a comparison, however, is misleading. What we want to know is the quantity that may be expected to fall:—

(a) During the period of vegetation, and its distribution month by month. (b) During the harvest months.

The period of vegetation in the North-West embraces May, June, July and August. The harvest months are September and October. I append the following tabulary arranged statements of rainfall:—

Table I.—For the Four Months of Vegetation.

PLACE.	POSITION.		RAINFALL IN INCHES.				TOTAL FOR 4 MONTHS.
	Lat.	Alt.	May.	June.	July	Aug.	
Winnipeg, Manitoba.....	49.53	740	2.17	3.42	2.68	7.11	15.37
Toronto, Ontario.....	43.39	350	2.98	3.04	3.73	2.81	12.55
Fort Riley, Kansas.....	39.03	1300	4.14	3.08	1.08	2.99	11.29
Rochester, New York....	43.07	506	3.04	3.25	3.01	2.00	11.00

Table II.—For the Two Months of Harvest.

PLACE.	POSITION.		RAINFALL IN INCHES.		TOTAL.
	Lat.	Alt.	Sept.	Oct.	
Winnipeg, Manitoba.....	49.53	740	0.73	0.03	0.76
Toronto, Ontario.....	43.39	350	4.45	2.96	7.41
Fort Riley, Kansas.....	39.03	1300	4.18	0.02	4.20
Rochester, New York.....	43.07	506	3.05	3.39	6.41

Having stated what the recorded facts as to rainfall are, I will give my reasons for asserting that these facts are the necessary consequences of the physical conditions existing in the west of the North American Continent.

In the beginning of this chapter I referred to the position of the Great American Desert, and pointed out one of its effects on the air-currents rising northward from the Gulf of Mexico—viz., its power to attract and draw them to itself, and to the westward of their natural course. Another effect arises from the heat given off by radiation during the summer months. The Gulf air currents, laden with moisture, when drawn over the desert, are met by the rarified and heated air ascending from its surface, and the rain which in the ordinary course they would shower down, being prevented from falling, passes on and is wafted by the prevailing winds in the direction of our North-West. There their long borne and priceless load is given forth in the form of our summer rains.

Having shown cause for the summer rains, I may now state that the simple "suspension of those desert effects which gave the summer rains," is the cause of the almost total absence of rain in the autumn and winter periods.

It was shown when writing on the winter temperature, that as the desert cooled down the main air currents from the Gulf of Mexico no longer pursued a westward course, but passed to the eastward. This change of direction takes them over the region of the Canadian Lakes, where they deposit an abundant rainfall.

AGRICULTURAL OPERATIONS.

The progress of the seasons and the labors of the husbandman may be summarized as follows:—

In April the hot and unclouded sun clears from the lands the last of its light snow covering, thaws, and at the same time dries the ground sufficiently to fit it for the plough, and almost simultaneously for seeding. Germination quickly follows and the young roots, moistened by the thawing of the subsoil, follow the pores opened out by the disintegrating power of the winter frosts, and penetrate to a depth inconceivable to those who have not put the matter to the test. By the time that the rains of May and June come, the roots have a firm hold of the ground, and growth is extraordinary.

The July and early August rains nourish and swell the ear of the now ripening crops, and complete the promise of the early spring. Towards the end of August the winds change and the almost rainless period sets in and continues all winter. The farmer harvests his crop without loss and in the highest possible condition, stacking it in the open air, without even the necessity of thatching it for the winter.

TO STOCK BREEDERS

The advantages are equally great. Storms of sleet or wet snow are unknown on the western plains. The snow

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is always dry and light, hence cattle and horses may be left out the whole winter without suffering from wet. Intense cold they may experience, but stock-raisers know that where the cold is dry, cattle are not hurt. Hence cattle can be raised on the North-West Plains without buildings for wintering them.

Reference was made to Blodgett's Climatology in the foregoing remarks, and I now quote a part of his work bearing on the climate of our North-West, written by him over thirty years ago. A careful study of what he says will be necessary to the reading with profit of the succeeding chapter:

"By reference to the illustration of the distribution of heat we see that the cold at the north of the great lakes does not represent the same latitude further west, and that beyond them the thermal lines rise as high in latitude, in most cases, as at the west of Europe. Central Russia, the Baltic districts and the British Islands, are all reproduced in the general structure, though the exceptions here fall against the advantage, while there they favor it through the influence of the Gulf Stream.

"Climate is indisputably the decisive condition, and when we find the isothermal of 60° for the summer rising on the interior American plains to the 61st parallel, or fully as high as its average position for Europe, it is impossible to doubt the existence of favorable climates over vast areas now unoccupied.

"This favorable comparison may be traced for the winter also, and in the average for the year. The exceptional cold for the mountain plateaux, and of the coast below the 43rd parallel, masks the advantage more or less to those who approach these areas from the western part of the Central States, and from the coast of California; but though the distant mountain ranges remain high at the north, the width of their base, or of the plateau from which they rise, is much

less than at the 42nd parallel. The elevated tracts are of less extent, and the proportion of cultivable surface is far greater.

"It will be seen that the thermal lines for each season are thrown further northward on passing Lake Superior to the westward, in the charts of this work, than in those of the military report prepared by the author. At the time those were drawn the number of the observations beyond the limits of the United States were so small that the full expression was not given to the statistics then used, in the fear that some correction would ultimately be found to apply to them, reducing the extreme northward curvatures they indicated. But a further collection and comparison warrants the position now given to the thermal lines, placing them further northward than before, and extending them in a course due northwest from Lake Superior to the 58th parallel. For the extreme seasons, winter and summer, this accurate diagonal extension of the thermal lines across the areas of latitude and longitude is very striking. The Buffalo winter on the upper Athabasca, at least as safely as in the latitude of St. Paul, Minnesota; *and the spring opens at nearly the same time along the immense line of plains from St. Paul to Mackenzie River.*

"The quantity of rain is not less important than the measure of heat to all purposes of occupation; and for the plains east of the Rocky Mountains there may reasonably be some doubt as to the sufficiency; and doubts on this point whether the desert belt of lower latitudes is prolonged to the northern limit of the plains. If the lower deserts are due to the altitude and mass of the mountains simply, it would be natural to infer their existence along the whole line, where the Rocky Mountains run parallel and retain their altitude; but the dry areas are evidently due to other causes primarily, *and they are not found above the 47th parallel in fact.* It is decisive of the general question of the sufficiency of

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rain, to find the entire surface of the upper plains either well grassed or well wooded; and recent information on these points almost warrants the assertion that there are no barren tracts of consequence after we pass the bad lands, and the Coteau of the Missouri. Many portions of these plains are known to be peculiarly rich in grasses; and probably the finest tracts lie along the eastern base of the mountains, in positions corresponding to the most desert-like of the plains at the south. The higher latitudes certainly differ widely from the plains which stretch from the Platte southward to the Llano Estacado of Texas, and none of the references made to them by residents or travellers indicate desert characteristics. Buffalo are far more abundant on the northern plains, and they remain through the winter at their extreme border, taking shelter in the belts of woodland on the upper Athabasca and Peace Rivers. Grassy savannas like these necessarily imply an adequate supply of rain; and there can be no doubt that the correspondence with the European plains in like geographical position—those of Eastern Germany and Russia—is quite complete in this respect. If a difference exists it is in favor of the American plains, which have a greater proportion of surface waters, both as lakes and rivers.

* * * * *

“Next the area of the plains east of the Rocky Mountains, is not less remarkable than the first for the absence of attention heretofore given to its intrinsic value as a productive and cultivable region, within easy reach of emigration. This is a wedge-shaped tract, ten degrees of longitude in width at its base along the 47th parallel, inclined northwestward to conform to the trend of the Rocky Mountains, and terminating not far from the 60th parallel in a narrow line, which still extends along the Mackenzie for three or four degrees of latitude, in a climate barely tolerable. Lord Selkirk began his efforts at colonization in the neigh-

bourhood of Winnipeg as early as 1815, and from personal knowledge he then claimed for this tract a capacity to support thirty millions inhabitants. All the grains of the cool temperate latitudes are produced abundantly. Indian corn may be grown on both sides of the Saskatchewan, and the grass of the plains is singularly abundant and rich. Not only in the earliest exploration of these plains, but now they are the great resort for buffalo herds, which with the domestic herds, and the horses of the Indians and the colonists remain on them and at their woodland borders throughout the year.

“The simple fact of the presence of these vast herds of wild cattle on plains at so high a latitude, is ample proof of the climatological and productive capacity of the country. *Of these plains and their woodland borders the valuable surface measures fully five hundred thousand square miles.*”

Mr. Anderson
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CHAPTER X.

Practical Remarks on Climate.

Mr. Anderson, of Listowel, Ireland, on Climate—Great Heat Causes no Inconvenience—Intense Cold Hardly Felt—Manitoba Winter Climate Better than that of Ontario—Snow Seldom over Twenty Inches in Depth—Seasons in Manitoba—Manitoba in the Middle of the Continent—Long Days of Summer—Autumn Weather—Snowfall—Heat and Humidity—Comparison of Summer Temperatures—Warm Summers and Dry Cold Winters—Table of Mean Temperatures—Summer Temperatures Compared—Peace River Climate—Manitoba Climate—Hardness of Wheat—Grains in the Cluster—Minnesota nowhere—Peace River Wheat—Isothermal Lines—Corn and Wheat Zones—Temperature Necessary for Successful Wheat Culture—The Wheat Zones—Probably Three-fourths of the Wheat Lands of America in the New North-West—200,000,000 Acres—Extent of the Territory—Lord Selkirk's Opinions Seventy Years Ago—Great American Desert—Its Effect on Climate—Changes Observed Passing North—How the Isothermal Lines Curve—Where the Heated Air comes From—Two Currents passing North—Summer Temperature the same over 300,000 Square Miles—Moisture in Summer, its Absence in Winter—Rainfall of the Year—Progress of the Seasons—Fall Frosts not Injurious, Climate Unsurpassed for Farmers—Its Possibilities Unlimited—Depth of Winter Frost—Its Beneficial Effects on Soil—Table of Rainfalls for 1879 and 1880—Rainfall and Cloudlessness—Testimony of Settlers Regarding the Healthiness of the Climate.

IN the preceding chapter I have given the facts and deductions regarding the temperature and humidity of the atmosphere of the North-West as noticed by myself. I shall now give details of a more practical nature, and adduce other evidence just as conclusive as my own, regarding summer and winter temperature, rainfall, and all other kindred subjects which naturally fall under the term climate.

The following extract is from the report of Mr. R. H. B. P. Anderson, of Listowel, Co. Kerry, Ireland. In it he gives his views of the climate and seasons as observed by himself. These are worth more than a passing glance, as he touches with a master hand the most salient points of the subject.

"The Climate of Manitoba and the North-West is one of the settler's most serious drawbacks, but we are inclined to look upon it as a much more serious affair than it really is.

Description will do little to remove these impressions, it must be experienced to be understood. At home, excessive heat is generally accompanied by oppressiveness, with its attendant weariness and inertia; and cold, as a rule, with dampness, which makes it raw and piercing. Now this is not the case in Manitoba or the North-West. The heat at 100° was undoubtedly very intense, but—and I speak from personal experience—without sultriness. I perspired freely, but otherwise felt no inconvenience, and had energy enough for any amount of work. This was an unusual degree of heat; the summer mean is, I believe, about 70° . Usually during summer there is a pleasant breeze, and the higher the thermometer stands the more likely is there to be a breeze. No matter how hot the day, the night is sure to be cool. In winter the cold is very great, but nothing like what it is at home in proportion to the degrees of frost; if it were, animal life would cease, for the thermometer sometimes sinks to 40° and 50° below zero—just imagine what that would mean in England! but when it does so it is certain to be accompanied by a bright and perfectly still atmosphere and a warm sun. However, as a rule, it stands at from 10° to 15° . As I had not an opportunity of experiencing it myself, I was not content with the testimony of the ordinary settler concerning it, but had that of such men as the Bishop of the Saskatchewan and clergymen of various denominations, as well as bankers and others, on whose opinion I could rely. All agreed in saying that one feels no colder when the thermometer stands at 40° than when it is at 10° below zero, and that winter is a delightful part of the year. Numbers of people from Ontario said that the climate of Manitoba compared favorably with that of Ontario. There are, however, slight deviations which are intensely disagreeable. In the summer there are sometimes extremely high winds and hail-storms, and in the winter storms of wind and snow—

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'blizzards' as they are called. In spring and early autumn frosts sometimes occur, which do no good to the crops; but all these things apply to the Western States of America just as much as they do to Manitoba. Indians camp out in their wretched canvas-covered tents during the most severe winters, and white men, when hunting, often do the same, and think nothing of it. A curious fact is that Europeans, for the first two winters, bear the cold better than Canadians. Snow does not fall to any extent till the beginning of the year, and seldom exceeds an average of eighteen or twenty inches in depth. When the thaw comes it is unaccompanied by that abominable slushiness we have at home; the snow evaporates leaving the ground dry. During spring and early summer an immense quantity of rain falls; drought, which so often ruins the farmer in the United States, never occurs here. The dew is so heavy that one would imagine that there had been a fall of rain in the night. The seasons are as follows: Spring—April and May; Summer—June, July, August, and part of September; Autumn—part of September to the middle of November; and then Winter. Of course in so extensive a country as Canada, there are slight differences in climate. In Ontario the harvest is ten days earlier than in Manitoba. All agree that as regards health the climate of the North-West cannot be surpassed."

Another observer, Rev. Aeneas McDonell Dawson, writes as follows:—"Manitoba is situated in the middle of the continent, nearly equally distant between the Pole and the Equator, and the Atlantic and Pacific Oceans. Its climate gives conditions of decided heat in summer, and decided cold in winter. The snow goes away and ploughing begins in April, which is about the same time as in the older Provinces of Canada, the Northern United States on the Atlantic seaboard, and the North-Western States, Minnesota and Wisconsin. The crops are harvested in August and

September. The long, sunny days of summer bring vegetation of all sorts to rapid maturity. The days are warm and the nights cool. Autumn begins about the 20th September and last still November, when the regular frost sets in. The winter proper comprises the months of December, January, February and March. Spring comes in April. The summer months are part of May, June, July, August, and part of September. In winter the thermometer sinks to thirty and forty degrees below zero; but this degree of cold in the dry atmosphere of the North-West does not produce any unpleasant sensations. The weather is not felt to be colder than that in the Province of Quebec, nor so cold as milder winters in climates where the frost, or even a less degree of cold than frost, is accompanied with dampness. In times of wind storms, however, the cold is found to be specially searching. The testimony of settlers is universal as to the fact that the winter is on the whole, both pleasant and healthy; and former residents of both Ontario and Quebec state that they like it quite as well as that of those provinces.

"Snow does not fall on the prairies to an average greater depth than eighteen inches, and buffaloes and horses graze out of doors all winter. They scratch the snow off the prairie grass, and grow fat upon it. Horned cattle graze out of doors part of the winter, but in some states of the weather they require to be brought in. Instances are, however, stated in which horned cattle have grazed out all winter.

"Heat and humidity are the two chief elements of climate, and these two divisions of the North-west, the prairie and wooded, have high summer temperatures and heavy summer rains. South of the parallel of Manitoba, lie the regions of summer droughts and great heat—producing the immense deserts over the western territories of the United States, The abundance of rain in British America, with summer temperature sufficient to mature all the great staples of the temperate zones, makes it a good agricultural country. The

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absence of summer rains, with high temperatures, leaves vast areas of the interior of the United States barren wastes, especially those parts of the country westward from the 100th Meridian or west of the Missouri. The following table will serve for comparison between the summer temperatures of the Red River and the countries south:—

	JUNE.	JULY.	AUGUST.	SUMMER MEAN.
Red River.....	69.10	71.16	68.03	67.76
Chicago.....	62.07	70.08	68.05	67.03
Iowa.....	66.04	70.05	68.09	68.06
Wisconsin.....	61.07	68.06	65.07	65.03
New York.....	64.02	68.05	66.07	66.05
Toronto.....	64.02	67.95	65.00	66.98

It will thus be seen that the summer is warmer than that of Northern Illinois, Western Wisconsin, Northern New York or Toronto. In relation to agriculture the intensity of winter cold is not injurious, but on the contrary it has advantages, and its effect upon physical comfort is mitigated as above stated, by a clear dry winter atmosphere."

Mr. J. W. Taylor, the Consul of the United States at Winnipeg, who has a right to be considered an indisputable authority on account of his long residence in Winnipeg, and thorough knowledge of the subject matter in hand, wrote the letter, from which the following extracts are taken, to the Editor of the "Pioneer Press," St. Paul, Minnesota. Mr. J. A. Wheelock, Commissioner of Statistics to whom he alludes is the very man to whom he addresses his letter, as the Editor and Statistician are one and the same person, and the present letter quotes the Editor against himself.

COMPARATIVE TEMPERATURE.

"A comparative statement of temperatures at St. Paul, Winnipeg, and Battleford, for the first months of the current year, including April, having been published by me and noticed in the "Pioneer Press," I assume that your readers will be interested in a similar statement for the year ending

July, 1879, to which I have added the monthly observations at Toronto:

	N. LAT.	W. LONG.
Toronto.....	43.49	79.23.
St. Paul	44.52	93 05.
Winnipeg.....	49.50	96.20.
Battleford.....	52.43	109.00.

"It will be convenient to refer to latitudes as Toronto, 44°; St. Paul, 45°; Winnipeg, 50°; Battleford, 53°. The place last named is situated on the Saskatchewan River, and is the capital of the North-West Territory of Canada, as the vast district west of Manitoba (longitude 99°) to the Rocky Mountains is now known geographically and politically.

Table of Mean Temperatures.

	TORONTO.	ST. PAUL.	WINNIPEG.	BATTLEFORD.
August	66.38	72.00	67.34	67.79.
September	58.18	60.06	52.18	47.10.
October.....	45.84	46.03	35.84	34.52.
November	36.06	38.03	30.66	28.68.
December.....	25.78	19.03	11.97	7.43.
January	22.80	16.03	6.10	0.45.
February.....	22.74	15.02	12.32	10.25.
March	28.93	33.01	14.14	16.84.
April	40.72	50.04	39.10	46.70.
May	51.74	58.07	53.13	53.35.
June.....	61.85	67.09	63.20	60.35.
July.....	67.49	73.05	68.19	63.95.
YEARLY MEANS.	44.04	45.61	36.67	36.46.

"A statement of mean temperature during the agricultural season, from April to August inclusive, exhibits the following proportions:—

TORONTO.	ST. PAUL.	WINNIPEG.	BATTLEFORD.
57.65.	65.05.	58.19.	58.53

"Thus it will be seen that the climate, in relation to agriculture, is warmer in Manitoba and over territory 700 miles to the northwest, than in the most central districts of Ontario, while St. Paul in lat. 45° is 7° 40' warmer than the vicinity of Toronto, in lat. 44°.

"I hope soon to be in possession of similar statistics from Fort McMurray on the Athabasca River, and Fort Vermilion on Peace River, respectively 1,000 and 1,200 miles due northwest of Winnipeg, and I have full confidence that the climate at these points will not be materially different from Battleford. The altitude of the Athabasca and Peace River district is less, and the trend of the Pacific winds through the Rocky Mountains is more marked than at Battleford. It was on the banks of the Peace River, well up in lat. 60°, that Sir Alexander McKenzie records, on the 10th of May, the grass so well grown that buffalo, attended by their young, were cropping the uplands.

"But I find my best illustration that the climate is not materially different west of Lake Athabasca, in lat. 60° from what we experience west of Lake Superior, in lat. 46°, in some personal observation of the northwestern extension of wheat cultivation. In 1871, Mr. Archibald, the well-known proprietor of the Dundas mills in southern Minnesota visited Manitoba. He remarked that the spring wheat in his vicinity was deteriorating—softening,—and he sought a change of seed, to restore its flinty texture. He timed his visit to Winnipeg with the harvest and found the quality of grain he desired, but the yield astonished him. "Look," said he, with a head of wheat in his hand, "we have had an excellent harvest in Minnesota, but I never saw more than two well-formed grains in each group or cluster, forming a row, but here the rule is three grains in each cluster. That is the difference between twenty and thirty bushels per acre." More recently, Professor Macoun, the botanist of the Canadian Pacific Railway survey, has shown me two heads of wheat, one from Prince Albert, a settlement near the forks of the Saskatchewan, lat. 53°, long. 106°; and another from Fort Vermilion on Peace River, lat. 59°, long. 116°, and from each cluster of the two I separated five well-formed grains, with a corresponding length of the head.

Here was the perfection of the wheat plant, attained according to the well-known physical law, near the most northern limit of its successful growth.

ISOTHERMAL LINES.

"The line of equal mean temperature, especially for the season of vegetation between March and October, instead of following lines of latitude, bends from the Mississippi Valley far to the north, carrying the zone of wheat from Minnesota away to the 60th parallel in the valley of the Peace River, and reproducing the summer heats of New Jersey and southern Pennsylvania in Minnesota and Dakota, and those of northern Pennsylvania and Ohio in the valley of the Saskatchewan. * * * Within the isothermal lines that inclose the zone west and northwest of Minnesota, which is being or is soon to be opened to cultivation, lies a vast area of fertile lands from which might easily be cut out a dozen new states of the size of New York.

CORN AND WHEAT ZONES.

"I assigned Ohio, Indiana, Illinois, Iowa, and even southern Minnesota to the zone specially adapted to corn, as the more southern states constitute a cotton zone; and observing the imperative natural restrictions in the Mississippi Valley on the successful production of wheat, I hazarded the statement that three-fourths of the wheat producing belt of North America would be found north of the international boundary. This arithmetical division has since been questioned by the "Pioneer Press."

"I will venture to illustrate the climatic influences which control the problem under consideration, by some citations from 'Minnesota: Its place among the States; by J. A. Wheelock, Commissioner of Statistics,' which, though published in 1860, is all the more an authority because of the confirmation of twenty years. The general law of limitation to the profitable cultivation of wheat is thus luminously

stated. 'The wheat producing district of the United States is confined to about ten degrees of latitude and six degrees of longitude, terminating on the west at the 98th meridian. But the zone of its profitable culture occupies a comparatively narrow belt along the cool borders of the district defined for inland positions by the mean temperature of 55° on the north and 71° on the south, for the two months of July and August. This definition excludes all the country lying south of lat. 40°, except western Virginia, and north of that it excludes the southern districts of Pennsylvania, Ohio, Indiana, Illinois and Iowa, while it includes the northern part of these states, Canada, New York, Western Virginia, Michigan, Wisconsin, Minnesota, and the Red River and Saskatchewan Valleys. In general terms it may be stated that the belt of maximum wheat production lies immediately north of the districts where the maximum of Indian corn is attained.'

* * * * *

"Will the great interior of the continent contribute to our exportations of wheat and its flour? I refer to the territorial organizations of Montana, Idaho, Wyoming, Colorado, Utah and Nevada. Let us take the most favorable of all—Montana. Grand as are its resources, I am constrained to believe that only one-thirteenth of its surface is within reach of the unavoidable condition of irrigation, and that the mountains, with their mineral wealth, and the uplands as grazing grounds for cattle and sheep, will be the chief theatres of industrial activity. After careful inquiry in 1868, as United States Commissioner of mining statistics, I committed myself to the following statement:—'The area of the territory (Montana) is 146,689 square miles, equal to 93,881,184 acres—nearly the same as California, three times the area of New York, two and a half that of New England, and yet no greater proportion is claimed by local authorities as susceptible of cultivation than one acre in thirty, or a

total of 3,346,400 acres. Of course a far greater surface will afford sustenance to domestic animals. The limit to agriculture, as in Colorado and New Mexico, is the possibility of irrigation.' * * * * It is the crowning feature of the 'fertile belt' which broadens with reduced altitudes and constant air currents from the Pacific Coast, that the immense trapezoid, whose apex is bounded on the Mackenzie, has a sufficient quantity of summer rains for all the purposes of agriculture as organized in the Atlantic and Mississippi States.

"I have no pride of opinion as to the accuracy of an impromptu estimate of proportions north or south of the boundary. I would cheerfully waive it, confessing to an arithmetical inaccuracy, if assured of a general acceptance of the opinion with which the article of the "Pioneer Press" concludes, namely, that 'in Hudson's Bay Territory, outside of the old provinces, 200,000,000 acres are adapted to wheat raising.' That admission is more than enough to justify a railroad policy, which will push, within ten years, the locomotive from Winnipeg fully 1,200 miles beyond its present bourne on Red River."

The above extracts speak for themselves, and I have no diffidence in placing before the public the following summary of my own, after nine years study of the subject:—

The region included in the following observations lies between the boundary (lat. 49°) and lat. 60° north, these parallels forming the southern and northern boundaries of the territory, while it extends from the 95th meridian to the Rocky Mountains, following their northwestern trend to lat. 60° north.

For many years this vast extent of territory lay as a blank upon the maps, almost unknown to Englishmen and Canadians, and counted valueless except as a fur bearing country; yet so long ago as 1812, Lord Selkirk said that the valley of the Red River alone would maintain a population

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of 30,000,000. The Americans were always alive to its true value, but, like *true* patriots, extolled their own country in preference to the land of the stranger. Over twenty years ago their writers called attention to it, and Wheelock spoke glowingly of it in his work on Minnesota. In 1872, I had the good fortune to spend a number of months in the territory, and travelled over its whole extent from east to west, and, being impressed with its importance as a field for immigration, I have since then taken every opportunity to make myself acquainted with its climate and capabilities. In the following pages will be found my conclusions and the facts upon which they are based.

Geologists are aware that high arid plains always ameliorate the climate of countries north of them; and Blodgett in his work on the Climatology of the United States, says that such plains are decisive of a high degree of summer heat with an arid atmosphere and little rain or snow. Within the United States there are at least 500,000 square miles of arid country, almost constantly receiving enormous quantities of heat by day and giving it off at night by radiation. The general level of this plateau is fully 6,000 feet. At Laramie City it is about 7,000 feet above the sea, but from this point it rapidly falls off to the north, so that when it reaches the boundary at Pembina it is considerably less than 1,000 feet in altitude, and at the base of the Rocky Mountains under 4,000 feet. As the plain descends to the north the rainfall increases, the "cactus" and the "sage-brush" give place to bunch grass, and this, north of the line, soon passes into sward, quickly followed, as we proceed northward, by copsewood, which, north of the Saskatchewan, is replaced by an aspen forest, or, on the watershed, by spruce. No appreciable alteration in temperature takes place, but only an increase of moisture as we pass to the north, and with this increase of humidity a more equable temperature is noticed. Less radiation takes place as we leave the high

treeless plains, and, consequently, the variation of temperature is less strongly marked between day and night.

A careful examination of Blodgett's and Dove's charts shows that the isothermals curve upward from the Gulf of Mexico, and reach their northern bend in the United States, on the 110th meridian. Here in lat. 50° the mean summer temperature is placed at 70° , while at Winnipeg, 600 miles to the east, it is 65° . Following these lines 9° further north, we find that the isothermal of greatest heat passes Fort Vermillion, lat. $58^{\circ} 24'$, on the Peace River, and Edmonton on the Saskatchewan, both points being noted for their productions. On the Pacific side the isothermals commence to curve north from the head of the Gulf of California, reaching our boundary at the 115th meridian, having actually crossed the Rocky Mountains before reaching this point, thus producing those warm dry winds of the southwest which are known in Montana and north of the boundary as "Chinook Winds." These winds are noticed more particularly in winter, and often raise the temperature over 60° in the course of an hour or two. They are noted for being both warm and dry, as they evaporate the snow as fast as they melt it. Their effects are not much felt north of lat. 52° , and how far east they extend is not known.

Here, then, we have two currents of warm air flowing constantly into our territory, the one from the Gulf of Mexico, the other from the Gulf of California, and unitedly giving us heat and moisture which they have carried over the "Great American Desert" to leave on the lower plain to the north. Owing to the height and aridity of the "Desert," much heat is absorbed during the day, but it is constantly sent into the atmosphere at night, causing the air above the plain to be just as warm at night as during the day. Fort Laramie, in Wyoming Territory, is in the same latitude as Boston, and although 7,000 feet above the sea, has a summer temperature as high as Boston. A very little reflection will

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show that, were the "Desert" an inland sea, the winters of our interior would be like those of Eastern Europe. We would have a cooler summer and warmer winter. In an article like the present it would be out of place to discuss the climate of Eastern Europe, but the forces which enable the Russian to build his capital almost on the 60th parallel are precisely the same as those which send the warm air of the Gulfs to ameliorate the climate of our own North-West, and cause wheat and other cereals to be produced in the highest perfection. The following table of temperature is extracted from the Meteorological Report for 1876 :—

	April.	May.	June.	July.	August.	Sept.	Average for 6 months.	For 3 months
Fort Calgarry, Lat. 51° Long. 114°	36.7	51.8	61.0	59.0	53.5	47.2	51.5	57.8
Fort Simpson, Lat. 61° Long. 113°	....	44.6	53.8	63.4	63.2	46.9	....	51.3
Toronto, Lat. 44° Long. 79°	33.2	51.5	65.5	68.8	70.2	57.5	58.6	68.2
Winnipeg, Lat. 50° Long. 97°	35.4	52.1	59.2	65.8	63.3	51.8	54.6	62.3
Fort McLeod, Lat. 50° Long. 113°	39.8	53.3	60.6	63.3	57.0	50.3	54.0	60.2

It will be seen by the above data that Fort McLeod and Winnipeg, although 600 miles apart, have almost the same temperature, and, more surprising still, that Fort Simpson, although 770 miles due north of Fort McLeod, is *warmer*. Here we have a triangle with its three angles having almost the same summer temperature—its base being 600 miles in length, its perpendicular 770, and its hypotenuse 900. Further records will probably increase this area but no continuous observations having been taken, we do not hazard an opinion.

Captain Palliser, when in the Saskatchewan country in 1858-59, had pits sunk in the soil to see to what depth the frost penetrated, and at what time in the spring; the soil was free from it. On the level prairie in the vicinity of Edmonton, the frost penetrated to a depth of seven feet during the winter of 1858, while the next winter it penetrated to a depth of six feet. The former year there was scarcely

any snow, which accounts for the greater depth of frost. It may possibly remain in the ground all summer in a swamp but cannot remain in a fairly dry soil all the year round, except the mean annual temperature fall below freezing point. It is well known that a coating of moss or straw will keep the frost in the ground till June in Ontario, and I should not be surprised to hear of frozen soil in Manitoba in July. Captain Palliser found that the ground, three feet below the surface, grew colder until about the 25th February, when the temperature began gradually to increase, but it was not until the 23rd of May that it had risen to 32°. I infer that the great depth to which the soil is frozen in winter is beneficial to the growing crops both as a fertilizer and as a retainer of moisture.

After temperature the most important factor is humidity, and here, again, we have a remarkable example of a well known natural law. As above stated, the winds are constantly drifting northward, and in winter, owing to their passage across the "American Desert," which is now very cold, they lose most of their moisture, and pass over our prairie as dry winds. In summer the very reverse of this takes place; the dry, hot plains prevent deposition, and hence the winds come loaded with moisture, and give the summer rains which cause such astonishing growth in June and July. In most cases this dryness of the atmosphere is injurious to growing crops, but, owing to the situation of the plains, in our case it is a positive good, the rains coming just when wanted, and ceasing when of no further use to the growing crop. The following data, taken from the Meteorological Report of 1876, illustrate this :--

	WINTER.	SPRING.	SUMMER.	AUTUMN.
Quarterly rainfall at Winnipeg.....	0.00	5.69	10.52	0.04
" " " Toronto.....	5.51	6.63	5.74	3.18
		FIRST HALF	SECOND HALF	
		OF YEAR.	OF YEAR.	
Snowfall, in inches, at Winnipeg.....		28.6	29.7	
" " Toronto.....		67.7	45.7	

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It will be seen by the foregoing table that the rainfall at Winnipeg in summer and spring is nearly equal to that of Toronto for winter, spring, and summer, and where Toronto has over three inches in autumn, Winnipeg has scarcely any. The absence of autumn rains in the west is a priceless boon, as it enables the farmer to thresh and harvest his grain without injury, and besides, gives him excellent roads when he needs them most.

The progress of the seasons and the labors of the husbandman, throughout the North-West, may be summed up as follows: Early in April, the hot sun dissipates the slight covering of snow, and almost immediately, ploughing commences, as after the frost is out six inches, spring work may begin. Seeding and ploughing go on together, as the ground is quite dry, and in a few days the seed germinates, owing to the hot sunshine; the roots receive an abundance of moisture from the thawing soil, and following the retreating frost through the minute pores opened in it, by its agency penetrate to an astonishing depth (often two feet), all the time throwing out innumerable fibres. By the time the rains and heat of June have come, abundance of roots have formed, and the crop rushes to quick maturity. It is just as much owing to the opening power of the frost as to the fertility of the soil that the enormous crops of the North-West are due, and, as long as the present seasons continue, so long will the roots penetrate into the subsoil, and draw rich food from the inexhaustible reservoirs which I know are there.

After the middle of August the rains almost cease, and for ten weeks scarcely a shower of rain falls, giving the farmer time to do all necessary work before the long winter sets in. These general characteristics apply to the climate of the whole North-West, and the same results are everywhere observed over tracts embracing 300,000 square miles of territory. One important result of this peculiar climate is the hardness and increased weight of the grain

caused by it. Another, equally important, is the curing of the natural hay. Our experience of October and November has been that the horses and cattle do better to collect their own food on the prairie than to be fed with hay. All stock raisers know that it is not cold that injures horses or cattle, but those storms of sleet or soft snow which are so common in Ontario and the Eastern Provinces. Such storms are not seen in the North-West, and the cattle are never wet from November to April.

Many intelligent persons are afraid of the winters of the North-West, as they measure the cold by the thermometer rather than by their own sensibilities. It is not by the thermometer that the cold should be measured, but by the humidity of the atmosphere. All through the fall my men never noticed a few degrees of frost, and it was no uncommon thing to see a man riding in a cart without his coat, when the thermometer was below freezing point. J. A. Wheelock, Commissioner of Statistics for Minnesota, wrote as follows concerning the atmosphere of that State, over twenty years ago: "The dryness of the air in Minnesota permits a lower range of temperature without frosts than in moist climates. The thermometer has frequently been noticed at 20 degrees without material injury to vegetation. In the damp summer evenings of Illinois and Ohio, for example, the heat passes off rapidly from the surface of the earth and from plants. Frosts develop under such circumstances at a comparatively high temperature. The constant bath of moisture has softened the delicate covering and enfeebled the vitality of plants; and thus a fall of the thermometer which in Minnesota would be as harmless as a summer dew, in Ohio would sweep the fields like a fire."

What Wheelock says of Minnesota is equally true of the North-West Territories, and more so, as they are certainly drier. Dry air is a non-conductor of heat, and as the dryness increases with the lowering temperature, the in-

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creasing cold is not felt by either animals or plants, and we find a solution to the paradox, that although water may freeze, vegetation is not injured except when a humid atmosphere is in immediate contact with it. The increase of dryness in the air has the same effect as an increase of warm clothing for man and beast. We suffered less from a temperature of 10° below zero, this winter, though lying in tents, without fire, than we would have done in Ontario with 10° degrees of frost.

In conclusion, after nine years' study of all available material and constant observation, I can state that our peculiar climate is caused by the "Great American Desert," which commences at the 100th meridian, exactly south of our prairies, and extends with little interruption to the boundary of California. The winds passing over it descend on our interior plain, giving out heat and moisture in the summer, and in the winter wrapping the whole country in a mantle of dry air, which moderates the climate so much that without the aid of a thermometer no one would believe the cold was so intense. We, have then, a dry, clear, cold winter; a dry spring with bright sunshine; a warm summer with an abundance of rain, but not necessarily a cloudy atmosphere, and a dry serene autumn, with possibly a snow storm about the equinox.

An atmosphere like this, with a soil of abounding fertility extending over a region of almost boundless extent, causes me to feel that the words of Lord Beaconsfield were those of a far seeing statesman, and that our great North-West is truly a land of "illimitable possibilities."

During the summers of 1879 and 1880 I was on the plains the greater part of the season, and kept a record all the time, from which I make the following extracts:—

1879.

June 19. Very heavy rain with severe thunderstorm.

" 20. Beautiful day. Cloudy in the morning.

" 21. Light showers in the forenoon. Thunder at night.

- June 22 Warm, pleasant day.
 " 23. Terrible thunder storm this morning.
 " 24. Heavy rain all day.
 " 25. Showers in the afternoon.
 " 26. Rain as usual this morning.
 " 27. Lovely day. Dew heavy.
 " 28. Very beautiful day.
 " 29. Thunder storms passing to the south all day.
 " 30. Showers both north and south. No rain near us.
- July 1. Slight showers after noon.
 " 2. Thunder storm with heavy rain in the evening.
 " 3. Very lovely day.
 " 4. Day very fine.
 " 5. Severe thunder storm with heavy rain.
 " 6. Slight showers in the afternoon.
 " 7-9 Very fine days.
 " 10. Thunder storm with rain to the south.
 " 11. Very hot day.
 " 12. Thunder storm to the south. Gale from the west.
 " 13. Gale continued all day.
 " 14. Wind still strong. Light shower.
 " 15. Gentle wind. Lovely day.
 " 16. Thunder storm in the northwest. Lovely day.
 " 17. Very fine day. Thunder storm in the night.
 " 18-22 Very beautiful days.
 " 23. Heavy rain this morning and nearly all day.
 " 24. Heavy showers in the afternoon.
 " 25-30. Lovely days.
 " 31. Rain fell all the forenoon. Rain all night.
- Aug. 1. Wet forenoon.
 " 2. Almost a frost this morning.
 " 3. Day very hot. Thunder storm to the southeast.
 " 4. Day very hot. Heavy rain in the night.
 " 5. Cool morning.
 " 6-11. Weather intensely hot.
 " 12. Thunder in the distance. Slight shower.
 " 13. Very lovely day. Severe thunder storm at night.
 " 14. Very lovely day.
 " 15. Very hot day. 92° in shade.
 " 16. Very hot day. Strong gale without a cloud.
 " 17. Great change in the weather. Air quite cool.
 " 18-19. Changes still continue.
 " 20. Clouds look very rough.
 " 21-22. Weather very pleasant. Thunder after dark.
 " 23. Weather very pleasant. Terrific thunder storm in the night.
 " 24. Rain and a strong gale. Our tents blown away.
 " 25. Cool windy day.
 " 26. Pleasant day.
 " 27. Rain threatening.

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- Aug. 28. Rain threatening. Came at 6.00 p.m. Rained all night.
 " 29 Rain this morning.
 " 30 Lovely day.
 " 31. Cold showers.

During the month of September scarcely any rain fell, but there were a number of cloudy days and white frosts at night. The month closed with a thunder storm succeeded by a number of hot days. These were followed by strong winds which lowered the temperature, and on the 9th October a heavy snow storm was experienced over the whole country west of the Touchwood Hills. This snow soon disappeared and lovely weather with occasional low temperatures continued till late in the season.

1880.

- June 19. Thunder storm with rain.
 " 20. Rain threatening all the morning.
 " 21. Heavy rain with thunder.
 " 22-23. Very fine days.
 " 24. Slight showers in the north in the evening.
 " 25. Light local showers at noon. Terrific thunder at night.
 " 26. Evening cool.
 " 27. Slight rain after dinner.
 " 28. Thunder storm with heavy rain.
 " 29. Thunder storm with heavy rain in the afternoon.
 " 30. Lovely day.
 July 1. Thunder in the distance.
 " 2. Heavy rain in the night.
 " 3. Heavy rain at noon.
 " 4. Showers about noon, accompanied by thunder.
 " 5. Lovely day.
 " 6. Light rain at night.
 " 7. Thunder storm in the afternoon.
 " 8. Thunder storm at night.
 " 9. Pleasant day.
 " 10. Showery in the afternoon.
 " 11. Thunder storm in the night with heavy rain.
 " 12. Showers all around in the afternoon.
 " 13. Very fine day.
 " 14. High wind and heavy showers.
 " 15. Showers in the distance.
 " 16. Day very hot. Usual thunder and rain storm.
 " 17. Very hot day. Thermometer 87° in the shade.
 " 18. Lovely day.
 " 19. Lovely day. Strong wind all day.
 " 20. Thunder and rain in the afternoon.

- July 21. Day extremely hot. 89° in the shade.
 " 22. " 95° in the shade.
 " 23. "
 " 24. Thunder storms in the distance.
 " 25. Very warm. 90° in the shade.
 " 26. Terrible thunder storm in the afternoon. Max. 93°.
 " 27. Usual thunder storm. Max. 93°.
 " 28. Pleasant day.
 " 29. Cloudy at night.
 " 30. Very fine day.
 " 31. Light rain in the morning. Thunder storm at noon.
- Aug. 1. " "
 " 2. Pleasant day.
 " 3. Pleasant day. Wind strong from the south.
 " 4. Day warm. Thunder storm with heavy rain.
 " 5. Thunder and rain all night.
 " 6. Very pleasant day.
 " 7. Very warm all day.
 " 8. Sun's rays extremely hot. Max. 92°.
 " 9. Severe thunder storm in the afternoon.
 " 10. Cool day. Heavy rain in the afternoon.
 " 11. Very heavy rain with thunder all the forenoon.
 " 12. Pleasant day.
 " 13. Day very pleasant.
 " 14. Stormy day with heavy rain.
 " 15. Cold rain, which continued all day.
 " 16-17. Fine pleasant days.
 " 18. Light showers.
 " 19. Cool and pleasant.
 " 20. Day very hot.
 " 21-22. Thunder storm all night with torrents of rain.
 " 23. Heavy rain all day.
 " 24. Cold rain all day.
 " 25. Temperature low. Clearing up.
 " 26-27. Very pleasant days.
 " 28. Cloudy with light showers.
 " 29. Pleasant day. Wind strong from the west.
 " 30. Fine, pleasant day.
 " 31. Heavy rain storm all day with a fierce gale.

September was much wetter than usual, with three very cold rain storms and low temperature accompanied with heavy gales. The early part of October was delightful with warm pleasant weather. About the 15th this changed to cold, and after this time the nights were more or less frosty.

Although rain is frequent in summer, cloudy weather is uncommon, and many of the days on which rain is recorded

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were more than three-fourths cloudless. Heavy dew occurred every night that the minimum thermometer fell to 50°. As the nights were nearly all cloudless the temperature during the summer had a great range, being often 92° at noon, and sinking to 55° in the night. A fall of temperature was always followed by rain without thunder. All severe thunder storms took place when the barometer was very low, but a light one might take place at any time. A rising barometer nearly always gave cloud, and very often rain, in summer; in the autumn this was always so.

The following notes on the healthiness of the climate are taken from the evidence of a great number, and are appended to show what settlers think of the country:—

Testimony respecting Climate.

NAME.	POST OFFICE.	REMARKS.
Haward and Swain.....	Morris	We have never had any sickness.
John Kelly	"	The climate is very healthy.
George Cadman.....	High Bluff	We have had very little sickness.
William Jackson	"	We have found the climate very healthy.
A. J. Moore.....	Nelsonville	The climate is very healthy.
Benj. J. Chubb	"	Have had no sickness.
Allan Bell.....	Portage la Prairie.	We have enjoyed excellent health.
Jno. Brydon	"	The climate is very healthy.
James Airth	Stonewall	The climate is healthy.
William Eagles	"	The climate is healthy.
Isaac Casson.....	Emerson	Have found the climate very healthy.
F. T. Bradley.....	"	None of family suffered through climate.
A. Macdonald.....	Gladstone	The climate is very healthy.
Robert Fisher.....	Cook's Creek.....	Have had no sickness.
J. G. Ruit	"	I find the climate very healthy.
George Taylor	Poplar District....	This is a healthy climate.
P. H. Brown	"	Healthy. Proper clothing is necessary.
J. S. Higginson.....	Oakland	No sickness in six years.
W. Gresson	Meadow Lea	The climate is very healthy.
James Stewart	"	No case of sickness.
E. W. Johnston	Springfield	The climate is fairly healthy.
William Corbitt.....	"	My family have excellent health.
J. W. Adshhead	St. Charles	The climate is very healthy.
Ben. Haitley	"	The climate is very healthy.
Robert Black	Bird's Hill.....	The climate is very healthy.
W. A. Mann	"	The climate is quite healthy.
G. V. Fitzgerald.....	Ridgeville.....	The climate is very healthy.
D. F. Enight	"	We have had no sickness.

NAME.	POST OFFICE.	REMARKS.
James Fleming.....	West Lynne.....	Have had no sickness.
S. Ballantyne.....	".....	We have had perfect health here.
J. Sutherland.....	Kildonan.....	The climate is exceedingly healthy.
J. Geddis.....	".....	The climate is very healthy.
William Green.....	St. Agathe.....	The climate is very healthy
D. G. Low.....	".....	The climate is exceedingly healthy.
John Smith.....	Westbourne.....	The climate is healthy.
Rev. T. Scott.....	".....	The country is decidedly good for health.
Andrew Dawson.....	Headingley.....	There is no sickness at all.
W. R. Hall.....	".....	The climate is healthy.
C. Begg.....	Stone Fort.....	Had forty-seven years of good health.
T. B. Robinson.....	Rockwood.....	I cannot complain of the climate at all.
Robert Bell.....	".....	The climate is very healthy.
William Hill.....	Woodlands.....	There is no sickness.
Neal McLeod.....	Victoria.....	The climate is quite healthy.
John Currie.....	".....	The climate is quite healthy.
Joseph Dobbs.....	Sunnyside.....	My family has never been sick.
John Hourie.....	St. Anne.....	The climate is extremely healthy.

CHAPTER XI.

Natural Products of the Soil.

Comparison of Floras—Peace River Flora Compared with that of Ontario—Forest Flora—Flora of the Prairies—List of Species—"Sugar Maple"—Syrup from the Birch—Wild Plums—Cherries—Service Berries—Their Value—Berries in Pemmican—How Pemmican is Made—Berries for Breakfast—Strawberries—Currants and Gooseberries—Black Currants very Valuable—High Bush Cranberries—Raspberries of Many Species—Jam from the Cloud Berry—Common Cranberries—Blueberries—Wild Sarsaparilla—Silver Berry—Buffalo Berry—Beautiful and Valuable Shrubs—Wild Hops—Hazel Nuts—Flowers and Shrubs at Brandon—Their Beauty and Utility—Strawberries at Brandon—Shrubs of the Prairie—Moose Mountain Flowers—Flowers at the Sand Hills and Flat Creek—Line of C. P. R.—Pipestone Creek—Flowers of the Plain—Great Souris Plain—Acres of Lilies—Gardens of the Prairie—Roses Fill the Air with Perfume—Flowers at Moose Jaw Creek—Flowers of the Cypress Hills—Wild Lupines Covering Square Miles—Mushrooms, their Great Value and Enormous Size and Numbers—Mushrooms over 200 Miles of Country—Lycoperdons (Puffballs) not Poisonous—Flora at Long Lake, Lilies, Anemones, Pentstemons, Potentillas and many Others—Common Poplar a Remedy for Intermittent Fever.

HAVING spent a number of years in exploring the interior plains, and every season having made large collections of the flora, I am able to state what the actual products of the soil are. As every variety of soil and situation changes the flora, an enumeration of the species of each particular district would be necessary to enable a person capable of judging to form a proper estimate of the relation of that particular district, to another well-known one. In writing of the Peace River Flora in 1877, and calling the attention to the climate of that district, I gave lists of the plants collected at certain points on that river, and compared them with those of Belleville, Ontario. The latter city being in Lat. 44°, while the most southern part of the Peace River country was north of Lat. 56°, or 840 miles north of Belleville. As the difference in Longitude is about 43°, the direct distance in a northwest line is close upon 2,250 miles.

The collections referred to were made by myself in 1875, and were as exhaustive as time would permit. It is well-known, however, that the commoner plants are the typical ones of a district, and these were the species observed by me. The localities mentioned are Hudson's Hope, in Lat. $56^{\circ} 12'$ whence Peace River issues from the Rocky Mountains; St. John's, 60 miles to the east; Dunvegan, 120 miles lower down; Fort Vermilion, 300 miles further down and in Lat. $58^{\circ} 24'$. The others were made at Little Red River, 100 miles to the east, and the last at the western end of Lake Athabasca, in Lat. $58^{\circ} 42'$.

COMPARISON OF FLORAS.

	TOTAL.	BELLEVILLE.	QUEBEC.	WEST OF ROC. MOUN.	GREAT PLAINS.
Hudson's Hope.....	211	136	7	17	51
St. John's.....	248	161	3	6	78
Dunvegan.....	246	160	2	5	79
Vermilion.....	159	112	2	1	44
Little Red River.....	128	88	1	0	39
Lake Athabasca	245	186	7	2	50

In the column under Quebec I place species not found at Belleville, but that belong to a cooler and possibly a moister region. The only species that show any signs of a boreal tendency are those in this column. Of all those obtained at Vermilion only two fell into this column namely, Yellow Rattle (*Rhinanthus Crista-galli*), and the Northern High Bush Cranberry (*Viburnum pauciflorum*). The features prominent in the whole region were a richness in the soil, and a rankness in the vegetation, never seen in Ontario.

Last summer I spent in the forest country west of Lake Winnipegosis, and found about the same proportion of species which indicated coolness and moisture, and a larger percentage of eastern forms.

The true prairie flora is altogether distinct from that of the forest, but along every stream, in the prairie, forest species are still numerous, so that an indiscriminate collection from any part of the plains is no indication of its true character.

A better knowledge of the southwest will show that large areas must remain permanent pasture, as there are tracts where the plants indicate not an arctic but a mountain flora, hence being too elevated for agriculture. The more prominent of these areas are the Cypress Hills, and the elevated country that constitutes the foot hills of the Rocky Mountains, lying between Forts McLeod and Calgary. As I purpose treating of the grasses when speaking of the great pastures, I shall now give a list of all other species of plants which have an economic value.

List of Species.

- Vitis riparia*, Mx. (Wild Grape)
Negundo aceroides, Moench. (Ash-leaved Maple.)
Prunus Virginiana, L. (Choke Cherry)
 " *Americana*, Marsh. (Wild Plum.)
 " *Pennsylvanica*, L. (Bird Cherry.)
Fragaria Virginiana, Ehrh. (Wild Strawberry.)
 " *vesca*, L. (Wood Strawberry.)
Rubus Chamæmorus, L. (Cloud Berry.) *Wood Strawberry*
 " *triflorus*, Rich. (Dew Berry.)
 " *arcticus*, L. (Arctic Raspberry.) *Eye-berry*
 " *strigosus*, Mx. (Raspberry)
Amelanchier Canadensis var.
 Saskatoon of the Indian, La Poire of the French Half-breed, and the
 June Berry of the Canadian.
Ribes hirtellum, Mx. } (Black Gooseberries)
 " *oxycanthoides*, L. }
 " *floridum*, L. } (Black Currants)
 " *Hudsonianum*, Rich. }
 " *rubrum*, L. (Red Currants)
Heracleum lanatum, Mx. (Cow Parsnip)
Aralia nudicaulis, L. (Wild Sarsaparilla)
Viburnum pauciflorum, Pylaie. } (High Bush Cranberry.)
 " *Opulus*, L. }
 " *Lentago*, L. (Pembina Berries)
Vaccinium oxycoccus, L. } (Low Bush Cranberries)
 " *macrocarpon*, Ait. }



THREE YEARS AFTER SETTLEMENT ON THE PRAIRIE.

THREE YEARS AFTER SETTLEMENT ON THE PRAIRIE.



THREE YEARS AFTER SETTLEMENT ON THE PRAIRIE.

FIFTEEN YEARS IN THE DUST.



- Vaccinium Vitis Idæa*. (Cow Berry)
 " *Canadense*, Kalm. } (Blue Berries)
 " *cœspitosum*, Mx. }
 " *myrtilloides*, Hook. }
Arctostaphylos Uva-ursi, Spreng. (Bear Berry)
Ledum latifolium, Ait.
Elaëagnus argentea, Pursh. (Silver Berry)
Shepherdia argentea, Nutt. (Buffalo Berry)
Corylus Americana, Walt. } (Hazel Nuts.)
 " *rostrata*, Ait. }
Betula papyracea, Ait. (Canoe Birch)
Pinus contorta, Dougl. (Black or Sugar Pine)

The Ash-leaved Maple or Box Elder has been referred to when speaking of the timber, and I will only further remark that wherever a grove of these trees is to be found there Indians have made sugar, and the bark pans in which they caught the sap are still lying around. Never having seen the sugar, nor heard of their mode of manufacturing it, I can give no information regarding it.

Throughout the whole north a syrup is obtained from the sap of the Canoe Birch (*Betula papyracea*) which is very useful. Being a product of the northern forest it is a valuable contribution to the culinary department of a Chipweyan's household.

Wild Plums are very common in many parts of Manitoba, and are simply delicious. In many localities this fruit can be gathered by the bushel, but like the Wild Grape it is local in its distribution, and does not extend beyond the boundaries of Manitoba. Choke Cherries, which in Ontario are extremely astringent, are in the North-West remarkably sweet, and pleasant to the taste. This species is very common on sand hills, and in thickets along the ravines or couleés entering the western rivers, and extends far to the north bearing as good fruit in the Peace River Valley as it does further south. His Excellency the Governor-General spoke in very high terms of this berry when in conversation with the writer some time since in Winnipeg. Other gentlemen have made the same remark, and all were surprised at

its sweetness. It is a fact however that all fruits are sweeter on the great plains than eastward. This is doubtless caused by the cloudless skies and general dryness of the atmosphere.

La Poire, June, or Service Berry is the chief berry of the west. Though common throughout the great plain, forming thickets along the margin of all coulées where wood grows, it attains its highest perfection along Peace River. Below Dunvegan on the north side of the river the bank rises in a succession of terraces. These terraces and the slopes are covered with the Service Berry, and for many miles along the river the bushes are purple with ripe berries about the beginning of August. At this time, bears, Indians, and Half-breeds, live almost entirely upon them. It is no uncommon thing to see five or six bears in a morning breakfasting on the berries and eating them with the greatest relish. As bears are plentiful at this time, their flesh and these berries are the general food of the camp. While visiting a *berrying* camp in 1875, on Peace River I was invited to breakfast. Our bill of fare consisted of boiled bear's flesh and Service Berries stewed in their fat. I need scarcely say that I ate a light breakfast. When on the Peace River Expedition in 1872, we had a quantity of pemmican made at St. John to enable us to cross the mountains. This pemmican consisted of one-third pounded meat (dried muscle) pounded to dust or shreds one-third grease (fine rendered fat) and one-third Service Berries. Its manufacture was very simple. The dried meat was put in a large trough and the berries added, after which the grease melted, was poured over the meat and berries. All was now thoroughly mixed with a wooden shovel, and put into skin bags made out of raw hide, with the hair side out. As it was shovelled into the bags a man pounded it solid. After these were filled they were sewed up and our food was ready.

Strawberries are a very valuable crop, but more so in the

middle regions, or northward than on the southern prairie. The true home of the strawberry is on the mixed prairie and forest lands, and here it bears heavy crops of fine delicious fruit that are highly prized by all residents in the country. While ascending the Assiniboine in June, 1879, a number of us left the steamer while she was "wooding up" a few miles above Brandon, and climbed the steep slope of the right bank (the coldest one) to the summit and there we obtained abundance of ripe strawberries on the 16th of June. At this date many are still planting their potatoes.

Black Currants, Red Currants, and Gooseberries, are abundant in many localities. The Gooseberries are represented on the plains by *Ribes oxycanthoides* and in woods by *Ribes hirtellum*. Only occasionally will the bushes be found loaded with ripe fruit, as some animal seems to live on the fruit in its semi-ripe state. Last season during August and a part of July we were in the alluvial valley of Red Deer River and its tributaries. On all the alluvial flats fine red and black currants were in the greatest profusion, and the men at meal-time gathered a dessert from the bushes close to them. Another Black Currant (*Ribes Hudsonianum*) ripened later, and like the Missouri Currant (*Ribes aureum*) instead of maturing altogether, as the common currant does, continued for a long time; the lower berries on the raceme always ripening first. In many cases the crop of black currants, were settlers there to gather them, would be of great value.

High Bush Cranberries are very abundant in the northern forest particularly *Viburnum pauciflorum*, which is the most northern form and which ripens before the first frosts. *Viburnum Opulus* is found principally in large clumps in river valleys, or on the borders of little ponds within the woods. Its fruit is not so acid as the other species, and is more abundant.

The three species of dwarf Raspberry are valuable, espec-

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ially in the north where their fruit is in the greatest perfection. *Rubus triflorus* is common in Ontario, but it is only in the cool damp forests north of Lat. 52° that it attains that juiciness and size which gives it value. *Rubus arcticus* is first seen in the swampy district, west of the Lake of the Woods, but here its fruit is of little worth. Westward on the watershed of the Churchill about Isle La Crosse, and northward towards Portage la Loche, it is a fine and very prolific berry. *Rubus Chamæmorus* grows still farther north, and this and the preceding are often found together in the muskegs. This species has a fine yellow fruit, and the preceding a bright red one. Both grow together in the same bog and often cover the surface with beautiful fruit. At Isle la Crosse and Lake Athabasca large quantities of these are collected by the Indian women, and made into jelly at the Hudson's Bay Company's posts.

Red Raspberries are found everywhere in lately burnt forest, and seem to be larger and better fruit than we have in the east. Many writers speak as if this fruit was everywhere, but being a close attendant on burnt forest, it dies out when grass usurps its place.

Low Bush Cranberries are common in all peat bogs, and tamarac swamps, but the fruit is not often gathered, as there is no demand for it. *Vaccinium Vitis-Idæa* grows in great profusion in all sandy or spruce woods, after the forest is reached. It is one of the most abundant fruits, and is easily known by its bunches of bright scarlet fruit pendant on the ends of small stems covered with evergreen leaves. This fruit is common near Prince Albert. Although very acid it makes a fine jelly and is a first-class addition to an explorer's dessert.

Blueberries are not common except in certain localities, and these are so far removed from where permanent settlement will be made, that it is only necessary to mention the sandy tracts where Banksian Pine flourishes to indicate

where they may be obtained. The Dwarf Blueberry grows abundantly on the elevated country west of Edmonton, and here, as everywhere else, indicates a climate too cold for successful wheat culture.

Wild Sarsaparilla forms the greater part of the vegetation under the tall aspens in many sections, and wherever dry forest is, or thick brush on the plains, there it is also. Labrador Tea grows in all muskegs and marshes, and, if half that is said of its virtues be true, it will yet be much sought after by speculators, and manufactured into a specific for many diseases. At present, when tea is scarce, the Indians and Half-breeds use it sparingly.

Silver Berry is one of the commonest shrubs on the prairie, and deserves a place in all collections of hardy species. About the middle of June its small yellow flowers perfume the air. This perfume is wafted for miles on the light breezes of the prairie. Later its Silver Berries are attractive to the "Prairie Chickens," and amongst its stems in the fall coveys are sure to be found. Even the leaves are beautiful, and shine like silver, and when laid under a lens lovely stellate hairs of great beauty are revealed.

Buffalo Berry is generally found in the river or stream valleys of the south. It has also been found on the Assiniboine below Brandon, and at Manitoba House on Lake Manitoba. This is another fine shrub with beautiful foliage shining like silver, and in the months of August and September loaded with large clusters of bright red fruit. There is no other berry in the southwest comparable to it for the making of jelly. After we had been on bacon for months, a jelly of these berries was a luxury of the highest order. Grizzly bears are very fond of them, and are hunted where these grow. The only grizzly ever seen by me was in a thicket of these bushes. This shrub, if a quick grower, would be excellent for fencing, as it has a number of short and stiff thorny branches in every part.

Wild Hops are common in every river bottom throughout Manitoba. The past summer I found them climbing over shrubbery and up trees, and forming festoons over the end of every dead stick in the valley of Red Deer River, lat. 53°. No place in the Assiniboine valley is without them. At Fort Ellice the river bottom seems like a hop-yard after the leaves have fallen in autumn. Hops are in great profusion in the Qu'Appelle Valley, and hang in larger bunches than are generally seen in hop-yards.

Hazel nuts are found where there is brush. Many thickets of these bushes extend for miles, and being generally higher than a man's head, and growing in brulé cause travellers to dread them as they would a quagmire. The fruit is gathered in great quantities by the Indians and stored for winter use.

I purpose in the following pages to give a few notes on the flora of districts, knowledge of which is generally desired. A voyager on the Assiniboine in the ascent from Winnipeg to Brandon, cannot but remark the paucity of species in the river valley as regards trees. It is true he sees familiar forms but many eastern species are wanting, and he looks in vain for beech, maple, or pine, and only occasionally does he see oak or ash. Poplar and elm with willows, which sometimes attain to the size of trees, make up the bulk of the wood, while roses (*Rosa blanda*) and Pembina berries (*Viburnum Lentago*) form almost impassable thickets. The Ostrich fern (*Struthiopteris Germanica*) is occasionally very abundant, and attains a great height, and all herbaceous vegetation is astonishingly luxuriant. Climbers too are not wanting, and Wild Hops (*Humulus Lupulus*), Wild Balsam, Apple (*Echinocystis lobata*), Hedge Bindweed (*Calystegia sepium*), Wild Grapes (*Vitis riparia*), and Virginia Creeper (*Ampelopsis quinque folia*), are common or occasionally seen.

Berry bearing shrubs are not rare, as thickets of Wild Plum (*Prunus Americana*), Raspberry (*Rubus strigosus*),

Service Berry (*Amelanchier Canadensis*), High Bush Cranberry (*Viburnum Opulus et pauciflorum*), Wild Cherry (*Prunus Virginiana*), and White Thorn (*Crataegus coccinea*), are very common, and bear well flavored fruit; Gooseberries (*Ribes oxycanthoides*), Wild Black Currants (*Ribes floridum*), and Red Currants (*Ribes rubrum*), are abundant in the valley, the two latter where the soil is wet, the former on the drier slopes. A beautiful western shrub, the Buffalo Berry (*Shepherdia argentea*), is occasionally met with on the Assiniboine, but it is only on the Saskatchewan that it is seen in its beauty. A near congener, the Silver Berry (*Elæagnus argentea*), is abundant on the drier slopes, and throughout Manitoba is said to indicate good soil, but in reality it is only an occupant of a dry one. These two shrubs are well worthy of cultivation, being perfectly hardy, and having beautiful silvery leaves, and sweet scented flowers—the blossoms of the latter about the middle of June loading the air with their fragrance. Later in the season, the former is borne down with its close clusters of bright red acid berries, which when made into jelly and sweetened we found to be an excellent corrective to salt pork. The berries of the latter are of the same color as the leaves, and are quite mealy. These with rose hips constituted the principal food of our so called Prairie Chicken, the sharp-tailed Grouse (*Pedioecetes phasianellus*), during the fall and winter.

Besides the shrubs mentioned above, there are a few that should not be passed without notice, on account of their beauty. Foremost are the Lead Plant (*Amorpha canescens*), which was abundant at Portage la Prairie in 1872, and a smaller species, *Amorpha microphylla*, which is found in some abundance at the Rapids on the Assiniboine. Both these species are worthy of a prominent place in any of our gardens. Wild Honeysuckle (*Lonicera parviflora*) and two species of Snow Berry (*Symphoricarpus racemosus et*

occidentalis) with wild Cornel (*Cornus stolonifera*), and Downy Arrow-wood (*Viburnum pubescens*), are found in more or less abundance in the river valley. The Wild Cornel or Western Kinnikinnik is very abundant in the valleys of all streams, and it is from the inner bark of this shrub mixed with tobacco, that all the Indians of the plains, and the Half-breeds make the "Harouge" which they prefer to pure tobacco. The Kinnikinnik of the east (*Arctostaphylos Uva-ursi*), and the Creeping Juniper (*Juniperus Sabina* var. *procumbens*) are abundant on all sandy soil, and form the chief covering of the sand dunes and hills throughout the country.

In the Grand Valley (Brandon) and west to the Moose Mountain on the 102nd meridian, 452 species of plants were noticed during the latter part of June, the majority of which were common in Ontario; a few seemed to have a southern origin, while others were exclusively western, and others again extended far to the north.

At the time we crossed the extensive plain lying between the Grand Valley and Moose Mountain (the latter part of June), the whole country was gay with beautiful flowers. The air was loaded with the perfume of roses, and the *Elæagnus*, and every little mound was bright with the tall purple spikes of *Oxytropis splendens* and *Lamberti*, while the level prairie was dotted with patches of *Arnica angustifolia* looking like the Marigolds of our gardens. Even the marshes were beautiful with the nodding Plumes of the Cotton Grass (*Eriophorum polystachyon*), and their borders lined with *Dodecatheon* and the little yellow star grass (*Sisyrinchium Bermudiana*).

The Sand Hills at Flat Creek were covered in spots with a beautiful Cactus (*Mamillaria vivipara*) which grew in small compact clusters often not larger than a small apple with a beautiful pink flower rising from the centre. A lovely fern (*Botrychium Lunaria*) was growing amongst

the grass, and *Lathyrus venosus*—the western pea—formed thickets in the hollows between the hills. Around these hills were numerous marshes filled with various grasses, and sedges, while the hills themselves produced vetches and horse-tails (*Equisetum*).

At Pipestone Creek the vegetation (June 27th) was wonderfully luxuriant, and pasture excellent. The leading grasses were *Avena pratensis*, *Sporobolus heterolepis*, *Poa cusia et serotina*, *Stipa spartea*, *Vilfa cuspidata*, *Calamagrostis stricta et Canadensis*, and *Phalaris arundinacea*. The ponds contain *Carex aristata* in the centre where the water is deep and permanent, outside this line *Carex lanuginosa* and *Carex marcidula*. The three species are found in this order all over the country, and wherever they exist water is abundant. When *Carex aristata* disappeared from the ponds, water was bad or merely rain water, and we had to be on the alert.

The prominent flowers were three species of Penstemon, (*P. gracilis*, *cristatus et confertus* var.), *Hedysarum boreale*, *Thermopsis rhombifolia*, *Gaura coccinea*, *Galium boreale*, *Sisyrinchium Bermudiana*, *Arnica angustifolia*, and four species of Astragalus (*A. pectinatus*, *flexuosus*, *caryocarpus*, et *bisulcatus*). All of these would have been ornaments to any garden, and grew in such profusion that they gave a marked character to the landscape.

Passing westward towards Moose Mountain, *Hedysarum boreale* covered square miles of plain, and being tall, over two feet high, its spikes of lovely pink flowers were exquisitely beautiful, as they nodded to the pleasant summer breeze. A handsome Primula (*P. farinosa*) was very conspicuous, and together with its congener the *Dodecatheon* made the margin of many a marsh a floral paradise with the profusion of their lovely and bright tinted flowers.

The flora of Moose Mountain was in no respect different from that of many parts of Ontario, except in the absence of forest trees of which there were but few species.

After passing out on to the "Souris Plain" a marked change took place in the flora, and the soil became much drier. *Hedysarum Mackenzii* was occasionally seen in great patches, and being of a rich velvety purple, charmed the eye with its beauty. At this date (July 7th) many beautiful flowers were in their prime, and their peculiar habitats were worthy of more than a passing notice. Every species has its own habitat, and at one time in going through a rich hollow, lilies (*L. Philadelphicum*) will cover acres with orange red flowers. Leaving there and ascending a slope, we will have to cross a carpet of the richest purple, for here *Astragalus flexuosus* is extremely abundant, and fills the air with its perfume. On yonder knoll *Oxytropis splendens* and *Castilleja sessiliflora* dispute possession with *Astragalus pectinatus* and *Erigonum flavum*. We pass the ridge and now there is more water and a new series of plants come in to view, and *Zagadenus glaucus*, *Potentilla gracilis*, *Anemone Pennsylvanica* and *Lysimachia ciliata*, mixed with various species of *Astragali*, are noted, and as hours pass into days this ever changing panorama glides past filling our hearts with delight as we contemplate this garden of nature.

Days pass, and these lovely gardens are left behind, and now stretched out on every side, is a vast clay plain with an extremely rough surface. The flora has changed, birds have almost disappeared, and even the hills have gone out of sight, yet beauty is still around us on every hand, Roses (*Rosa blanda*), scarcely six inches high, load the air with perfume. *Lepachys columnaris* enhances the beauty of the landscape with its yellow flowers, and the rich green of the grass is pleasing to the eye, yet over all this vast expanse not a bird wings its flight, and our utmost exertions could hardly obtain water for ourselves and horses. One hundred miles and upwards is crossed, and the only shrubs seen are the two snowberries (*Symphoricarpus racemosus*

et occidentalis) and the rose bushes, while *Aster multiflorus*, *Lepachys* and *Triticum repens*, with various *Potentilleæ*, make up the bulk of the flora.

Moose Jaw Creek, like all other streams throughout the country, had essentially an Eastern flora, and it was only on the gravel ridges and clay slopes bordering its valley, that the western forms were seen. Here the species were characteristic of the arid plains to the south, and partook largely of an alkaline character.

The flora of the Cypress Hills is very remarkable, and differs in many respects from that of the plains. In the coulées which extend into the hills on the north and east sides, the vegetation is almost exclusively eastern, and contains numerous forest species, while that of the plateau above, and the upper slopes of the hills have the prairie features of the Rocky Mountain flora, and both Alpine and boreal species here find a home.

In the upper part of the coulées amongst the spruce at the eastern end were *Spiraea betulifolia*, *Geranium Richardsonii*, *Habenaria rotundifolia*, *Phleum alpinum*, *Arenaria nardifolia et verna*, *Delphinium azureum*, and on the exposed gravel points and ridges that rose almost perpendicularly were *Astragalus pauciflorus*, *Sedum stenopetalum*, *Cetraria nivalis*, *aculeata et Islandica*, *Polygonum Paronychia*, *et Vesicaria montana*. In the deep coulées around springs of purest water, were large patches of *Mimulus Jarnesii* covered with a profusion of yellow flowers, and amongst the common sedges were *Carex festiva* and *capillaris*. These, all mountain species, and numerous others known to dwell there, told a tale that the botanist alone could understand. Whether the Cypress Hills were an outlier of the Rocky Mountains or not, their flora indicated that their climate was that of the foot hills above Morleyville, and necessarily unfit to regularly mature cereals, although, in sheltered valleys, barley and potatoes could possibly be raised.

The grasses of the plateau were of the real pasturage species, and produced abundance of leaves, and were so tall, that for miles at a time we had great difficulty in forcing our way through them. The chief were species of *Festuca*, *Danthonia*, *Poa*, *Avena pratensis*, *Bromus*, and *Phleum alpinum*, and although their seeds were all ripe (August 4th) their leaves were quite green.

As we proceeded westward over the plateau, it became more elevated and other species began to take prominence, notably *Lupinus argentea* and *Potentilla fruticosa* covered miles of country to the exclusion of other species, and as both grew about eighteen inches in height, and had a bushy habit, the whole country, for a day's travel, was either blue or yellow or both, as either species prevailed or were intermixed. In all my wanderings I never saw any spot equal in beauty to the central plateau of the Cypress Hills.

After the middle of August, 1880, mushrooms became very abundant, and continued with us until the latter part of September, when the frosts became too severe, and prevented their growth. There were three species all equally large and numerous, and although we consumed great quantities of them we never observed any ill effects from their use. There was one species, however, which was very large, and more abundant than the others, which I did not touch, as I did not like its appearance, yet the usual test indicated it to be nutritious. While crossing the great plains north of the Qu'Appelle in July, 1879, we found mushrooms by the cart-load, and the past season we used them every day for three weeks while travelling at least two hundred miles in an easterly direction. From the reports of other travellers, and my own observations, I am lead to believe that on nearly the whole prairie abundance of mushrooms will be obtained after any great rain fall during the summer. One species of *Lycoperdon* (Puff Ball) was seen that grew to a very large size, and numerous others were noticed during the whole

season scattered over the plain in great profusion. No *Lycoperdon* is poisonous, but if gathered young before the spores turn yellow, cut into thin slices, and fried, are highly nutritious. Were it possible to teach the Indians to discriminate between the good and bad mushrooms, immense quantities could be collected every year, dried and stored away for future use as is done in Norway.

The following notes from my journal will illustrate the flora in the vicinity of Long Lake as seen the first week in July, 1879. Flowers are a most conspicuous feature of the prairie. *Heqysarum* and various *Astragali* vieing with the lily and the vetch in loveliness and luxuriance. Often whole acres would be red and purple with beautiful flowers, and the air laden with the perfume of roses. Sometimes lilies (*Lilium Philadelphicum*) are so abundant that they covered an acre of ground bright red, at others they are mixed with another lilisaceous plant (*Zagaden's glaucus*) and form a ring around the willow thickets which we pass. At another time we come upon a pool of fine pure water, and within is *Carex aristata* which the horses love so well, around it where the water is nearly gone are *Carex marcida* and *lanuginosa*. Outside of these a ring of white anemones (*Anemone Pennsylvanica*) and growing where it is slightly drier a yellow flower (*Potentilla gracilis*). As the ground became still drier the Purple Pentstemons (*Pentstemon confertus*) would appear, and lastly the lilies would surround the whole.

Mushrooms are extremely abundant, and attain a fabulous size. They grow in regular "fairy rings" often more than 40 feet in diameter. Some rings were found to contain so many, that taking all good and bad from one ring, we could almost load a cart. Other rings were devoted exclusively to a species of giant Puff-ball which were extremely numerous on almost every part of the plains. Amongst many others I measured one specimen of a mushroom that was 33½

inches in circumference, and $2\frac{3}{4}$ inches through the cap. The stem was over 2 inches in diameter and weight over three pounds.

Dr. Loew, of the American Geological Survey, reports that the bark of the common Aspen (*Populus tremuloides*) is used by the Indians in intermittent fever. His analysis of the bark gives salicin and populin. The former was long ago in common use in intermittents. "It has," says Dr. Rothrock, "long been more or less a domestic remedy, and, indeed, of a certain class of practitioners, for this disease. It is not a little remarkable, however, that it should be used by the Indians, and we can only account for the fact that it does possess some remedial power in this direction, which a 'hit or miss' empiricism has led them to discover."

CHAPTER XII.

Raising Wheat.

Red River Prairie, Description of its Soil—An Old Countryman's Views—Extent of the Wheat Lands—150,000,000 Acres of Wheat Lands—Manitoba Excluded from the Calculation—Good Land Continues for 100 Miles at a Time—Fixed Laws Regarding the Growth of Wheat—Northern Limits of Wheat Zone—Northern Wheat more Prolific—The Cause Explained—How Wheat Grows in Spring and Summer—Why Manitoba Wheat is Hard—Roots Penetrate to a Great Depth—Analysis of Soil, far Superior to the Best Wheat Land in Europe—Best Soil in the World in the North-West—Manitoba Formerly an old Lake Bottom—Soil of the Second Prairie Steppe—Soil of the Third Plateau—Gypsum very Abundant—Cactus no Proof of Aridity—Setter's Farm Described—Wheat Growing amongst Cactus—Appearance of the Land—Results of 1880—of 1881—Seed Bought in Minnesota in 1876—Progress since Then—Manitoba Wheat Admitted Duty Free into Minnesota—Opinions of Pioneer Press of St. Paul's, Minnesota, regarding North-West Wheat—Statements of Residents—Average Crop for Four Years—Average Yield of Canadian North-West Compared with the best States in the Union—Great Weight of the Grain—Qu'Appelle Region as a Wheat District—Prince Albert and Edmonton as Wheat Districts—Description of Edmonton—Cust's Farm at Edmonton—Country on Peace River—Excellent Wheat Lands far to the North—Cucumbers Ripen in Lat. 60°—Wheat in Lat. 61° First-class—Spring Frosts not Hurtful—Fall Wheat not Suited for the North-West—Fall Sowing Recommended—No Doubt of its Success—Instances of Fall Sowing—Fall Sowing the True Policy of Settlers on the Prairie—Wheat Production of the Future beyond Calculation—England should Realise that we have the Greater part of the Wheat Lands of America—England's True Policy—Farmers Testimony Regarding the Soil.

THE Red River Prairie, or first Prairie Steppe, differs from the more western lands in being almost a dead level, except occasional ridges of gravel, which slightly change the uniformity of the surface. So much has been said and written regarding this prairie that I shall quote the opinions of only two individuals regarding it. One is noted for his scientific attainments, the other for his general intelligence and close observation. Dr. George M. Dawson thus describes the Red River Prairie in 1874:—

“Of the alluvial prairie of the Red River, much has already been said, and the uniform fertility of the soil cannot be exaggerated. The surface for a depth of from two

to four feet is a dark mould composed of the same material as the subsoil, but mingled with much vegetable matter. Its dark color is no doubt in part due to the gradual accumulation of the charred grasses left by the prairie fires. The soil may be said to lie ready for the plough, and in turning the tough prairie sod the first year, a crop of potatoes may be put in, though it is not efficiently broken up till it has been subjected to a winter's frost. When the sod has rotted, the soil appears as a light friable mould, easily worked, and most favorable for agriculture. The marly alluvium underlying the vegetable mould, would in most countries be considered a soil of the best quality, and the fertility of the ground may therefore be considered as practically inexhaustible.

The area of this lowest prairie has already been approximately stated at 6,900 square miles, but of this the whole is not at present suited for agriculture. * * * *

As a measure of the possible agricultural capacity of this great valley, take one-half of the entire area, or 3,400 square miles, equalling 2,176,000 acres, and for simplicity of calculation, let it be supposed to be sown entirely in wheat. Then at the rate of seventeen bushels (the average is over 25) per acre—which according to Prof. Thomas is the average yield for Minnesota—the crop of the Red River Valley would amount to 40,992,000 bushels.”

Our other quotation is from the report of Mr. R. H. B. P. Anderson, of County Kerry, Ireland. His description belongs partly to the Red River Prairie and partly to the Pembina Mountain district:—“The soil varies much, as it is natural to suppose over so large a tract of land, but as a rule it is rich, black, vegetable mould, working very like clay—rich beyond imagination and resting on a marly clay. The depth of the surface soil varies a good deal, in some places not more than ten or twelve inches, in others as many feet. I am informed that chemical analysis has

proved the soil to be the best adapted of any in the world for the growth of wheat, and certainly practical experience bears this out. It is very easily worked, becoming as fine as powder. However, there are all descriptions of soil to be had here, from the heaviest clay to the lightest sandy loam."

The above extracts will show that almost all observers class the land with the best in the world. Between Winnipeg and Edmonton, a distance by cart road of 980 miles, the various settlers affirm that where they are located is the best land in the country. Travel where you may the same story is told you, and proofs are shown of the astonishing fertility of the soil. At Fort Calgary in the south wheat produces enormously, and in lat. 59°, 600 miles due north of that point, I obtained wheat that took the Bronze Medal at the Centennial in Philadelphia, in 1876. In nineteenth-tenths of all this vast area there is a clay subsoil with a surface soil varying from black clay or clay loam to light sandy loam.

It is difficult to give even an approximate estimate of the extent of cultivable lands in the North-West Territories. The following was made at the request of the Government in 1877: If a line be drawn from the boundary line where it is intersected by the 95th meridian, in a northwesterly direction to where the 122nd meridian intersects the 61st parallel, we shall have the base of an isoscles triangle, which has its apex on the 115th meridian, where it intersects the 49th parallel, one side being the boundary and the other the Rocky Mountains. This triangle encloses at least 300,000 square miles, or over 200,000,000 acres of land. In a rough classification I estimated 80,000,000 acres as arable land and 120,000,000 acres as pasture, swamps, and lakes. After two years further examination, I submitted another report to the Government, of which the following is a condensed summary.

Since the date of my last report I have had opportunities of gaining a much more extended personal knowledge of the region, and I have had access to the reports of all the recent explorations made by others, and had personal conversations with the several explorers. I am, therefore, in possession of much additional data and in a position to classify the areas of land with greater general accuracy. I now submit what I consider a tolerably correct estimate of the areas of the several descriptions of land between the Rocky Mountains and Manitoba, not including the latter province, and excluding also any available land that may exist north of lat. 57° in Peace River District. The total area of available land suitable for agriculture and pasture was 150,081,280 acres after 30,000,000 acres had been deducted for bad and wet lands. Within the whole area of 180,000,000 acres there are isolated patches of unavailable land, consisting of marshes and swamps, sand hills, barren clays and stony tracts. Possibly not one-third or 10,000,000 acres of the whole 48,000 square miles which I have deducted from the total area could be classed as sterile or irreclaimably wet. There can be no doubt that drainage will ultimately do much to contract the area of land now considered valueless. At present I consider that in the North-West of Canada, beyond Manitoba and within the western and northern limits defined, there are at least 150,000,000 acres of land suitable for agriculture and stock-raising, and of this area I feel confident that a higher percentage will be found available for growing grain than in that portion of Ontario so well known for its productions—I refer to the peninsula lying between the Lakes Huron, Erie, and Ontario, and bounded on the north and east by a line drawn from Kingston to Lake Simcoe and the Georgian Bay.

Many unacquainted with the country think that good land is in patches like most other districts. Often for 100 miles at a time no bad soil is seen in any direction, and the

only land not suited for grain would be the marshes or the steep slope of a coulée. Much of the southern district now considered fit only for pasture will yet be known as the best of wheat lands. Nothing is needed to prove this but the plough.

There are certain laws applicable to wheat culture which are of the greatest importance when studied in reference to wheat growing in the North-West. Naturalists recognize the fact that there are certain limits within which each species of plant or animal attains its greatest development. I may mention here, that if the mean temperature of the two months, July and August, reaches 60° , wheat culture will be profitable. Now in the tables given in the chapter on climate, it is shown that in every part of the territory the temperature exceeds this. I might even state that this temperature is found over a far larger area. I believe that wheat culture will yet extend to within a short distance of Hudson's Bay and down the Mackenzie to lat. 65° . Another physical law fixes the greatest yield near the northern limit of successful growth. This was well exemplified by the wheat obtained in 1875 at Lake Athabasca, in lat. $58^{\circ} 42'$.

In Ontario seldom more than two grains to the cluster are found, in Manitoba three is the usual number, at Edmonton four or five, and at Lake Athabasca five or six. Did the average yield of Ontario reach fifteen bushels, the yield in Manitoba would be twenty-three, at Edmonton over thirty, and at Peace River forty bushels. This accounts for the large yields per acre reported from these places, and were only the same number of ears per acre harvested in the west the proportions would remain the same. But when an acre without either stump or stone is reaped we may expect to hear of thirty to forty bushels per acre being the average on well-tilled fields in Manitoba. There is no reason why sixty bushels to the acre should not be reaped.

On another page I have stated in detail the growth of wheat from seed time to harvest, and from that it will be

seen why the climate is so well suited for its growth. Coolness with moisture in spring gives root growth. The porous soil allows the roots to penetrate to an astonishing depth. During June and July there is abundance of rain and great heat, followed in August by still warmer weather and some rain, which completes the cycle of growth. As soon as the weather begins to cool, rain ceases and the air becomes very dry, hardening the grain and giving it that flintiness and weight for which all Manitoba wheat is noted. Two causes combine to produce the enormous crops reaped on those lands. The frosts of winter pulverise the ground to a depth of many feet. Summer rains, with almost constant sunlight, give a quick and vigorous growth. Owing to the looseness and porousness of the soil in spring the roots throw out many fibres, and when the rains come these openings are filled, and the growing crop feeds on eighteen inches of soil instead of three or four. Hence bad husbandry has little effect on the crop for many years. As long as the west is blessed with winter frosts and summer rains so long will teeming crops be the product of her soil. Were it necessary for the growth of the plant the small fibres could penetrate to a depth of over three feet. It will be remembered that the land is never *wet* when winter sets in.

Only a few samples of the soil have been properly analyzed as far as I am aware. One I will give in the words and figures of the chemist who made the analysis, Professor Emmerling, Director of the Chemical Laboratory of the Agricultural Association of Kiel, in Holstein. He writes to Senator Emil Klotz: "The analysis of the Manitoba soil is now completed, and the result is in 100,000 parts:

Potash	228.7
Sodium	53.8
Phosphoric Acid	69.4
Lime	632.6
Magnesia	16.1
Nitrogen	486.1

(Signed) "V. EMMERLING."

Senator Klotz writes from Kiel, May 4th, 1872: "After considerable delay I succeeded in obtaining the analysis of the Manitoba soil from Professor Emmerling, and hope it may be of service to you. Annexed I give you our analysis of the most productive soil in Holstein, whereby you will see how exceedingly rich the productive qualities of the Manitoba soil are, and which fully explains the fact that the land in Manitoba is so very fertile even without manure.

"The chief nutrients are, first nitrogen, then potash and phosphoric acid, which predominates there; but what is of particular importance is the lime contained in the soil, whereby the nitrogen is set free and ready to be absorbed in vegetable organisms. The latter property is defective in many soils, and when it is found defective recourse must be had to artificial means by putting lime or marl (a clay which contains much lime) upon the same. According to the analysis of the Manitoba soil there is no doubt that, to the farmer who desires to select for his future home a country which has the most productive soil and promises the richest harvest, no country in the world offers greater attractions than the Province of Manitoba, in the Dominion of Canada."

Analysis of Holstein soil and Manitoba soil compared:—

	HOLSTEIN SOIL.		MANITOBA SOIL.		EXCESS IN MANITOBA SOIL.
Potash.....	30	.....	228.7	.....	198.7
Sodium	20	.....	33.8	.....	13.8
Phosphoric Acid..	40	.....	69.4	.....	29.4
Lime	130	.....	682.6	.....	552.6
Magnesia.....	10	.....	16.1	.....	6.1
Nitrogen.....	40	.....	486.1	.....	446.1

Manitoba or the first Prairie Steppe was originally without doubt an old lake bottom. Lake Winnipeg is the remains of the lake. It follows that nearly all Manitoba possesses an alluvial soil, chiefly derived from decaying vegetation and the fine silts brought from the more elevated region to the west. Lying along the western margin of the Manitoba plain is a series of sand dunes, which gradually pass into the second Prairie Steppe, the soil of which is

different from that of the plain below. The surface here is principally a dark-colored sandy loam, sometimes passing into clay, while at others it becomes quite light and sandy, more especially in the vicinity of the various rivers. The subsoil is very uniform and seems to be a light-colored marly clay, containing numerous pebbles coated with carbonate of lime.

As we approach the confines of the third plateau the soil gradually passes into clay and the surface and subsoil become more homogeneous. It is on this plateau where most of the pasture lands are situated. The greater part of it is altogether without wood. The second steppe contains much sand in certain localities and the third much gravel in the more elevated tracts. It is simply then a change from silt to sand and from sand to gravel. Only, however, about five per cent. of the soil can be called either sandy or gravelly. The Second Steppe is composed of Cretaceous rocks overlaid with a thick coating of drift, while the Third Steppe is sometimes called the Lignite Tertiary Plateau, on account of it being composed of this group of rocks.

One of the chief ingredients in this higher plateau is Gypsum, which can be gathered in a crystallized state wherever there is a slide in a river bank. The surface water of this plateau is often a mild solution of Epsom salts where the soil is not covered by drift and the clays obscured. When the underlying Cretaceous clays are exposed the water is equally bad and the soil shows signs of aridity, being covered more or less with Cactus (*Opuntia Missouriensis*) and *Artemisia* (*Artemisia cana*). This is the "Sage Brush" of Palliser's Report, but not of the American Desert as he asserts.

As it is generally supposed that these Cactus flats are too arid for the growth of wheat, I insert an extract from my report for 1880. The location referred to is on the north side of the Cypress Hills, and certainly had every appearance of sterility prior to being broken up.

The creek upon which the farm is located has on its banks some willows and maples, the former being the largest I have seen in the North-West, a few being three feet in diameter. There is no poplar on the creek, and all fence poles have to be brought from the hills. All the land broken up was in the flats along the creek, and consisted almost wholly of soil, which in my former reports I had pronounced worthless. The hills were composed of light or dark-colored sandy loam with numerous boulders and some gravel on the hill tops, and the flats along the creeks of Cretaceous clay and so arid that grass could not form a sward. The flats were covered with sage brush (*Artemisia cana*) and Cactus (*Opuntia Missouriensis*) and everything betokened aridity. This was how the country looked when I was there on August 13th, except the part under cultivation.

Setter located the farm in April, set to work and broke up the *artemisia* and *cactus* flats, but got only a little sown before a drought set in, which continued all through June and caused some of the seed to lie in the ground over three weeks. Notwithstanding, I gathered ears of ripe wheat on August 14th, and have been informed since that the greater part of the crop ripened. At the time I gathered the ripe ears of wheat, Cactus was in flower for the second time, and both were flourishing together. The problem was solved, that the apparently arid soils were only so in appearance, and that all the land where not covered with sand or gravel would yet "blossom as the rose."

The soil had been broken up only to the depth of a few inches and the change was astonishing. I could not penetrate the sun-baked clay, but not a yard away, where he had ploughed, I could dig to any depth. On the one hand was life, while on the other, the *artemisia* and *cactus* gave evidence of death or profound slumber, as all vegetation was dried up by the great heat of the last month.

My own observations and those of others who have carefully examined many parts of the country, cause me to believe that actual settlement will show that fully eighty per cent. of the land is arable or will be located as farms.

During the summer of 1875 the grasshoppers were very destructive in Manitoba, and scarcely any wheat was raised. The next spring nine-tenths of the seed had to be bought in Minnesota, yet in the fall of 1878, 1,100,000 bushels of wheat were harvested. In 1881 it had risen to millions of bushels, and now when railroads are open to take it to market, its production will go on at an ever increasing ratio, the capacity of the country being only limited by the means of transport.

I place the testimony of residents in a tabulated form, to show the number of bushels raised by each per acre during the four years 1877 to 1880. As I give name and post-office address any person can verify the truth of the statement. One column is set apart for the average weight per bushel, so that parties may know that besides a large average of bushels there is a high average of weight. The number of bushels depends largely on soil, but the weight solely on climate, for no wheat can be heavy in a damp climate. Manitoba wheat is allowed to enter the United States free of duty when a guarantee is given that it is going to be manufactured for export. It has been found that a mixture of hard Manitoba wheat and the softer Minnesota makes a far better flour than the Minnesota alone, and the shrewd Yankee takes advantage of this and gets the wheat admitted in bond. The following quotation from the "Pioneer Press" of St. Paul, Minnesota, certainly a disinterested authority, will give point to the above statement. It says in its issue of November 8th, 1880:—

"It seems to be a settled fact that the further north wheat is grown, up to a certain limit, the better it is. * * *
The future great wheat region of the world will, undoubt-

edly be in the rich and far-famed valley of the Saskatchewan where this grain grows to perfection, not only in quality but in every other particular. The berry attains an amber color, rounds out into a fullness it does not attain here, and is rich in gluten, the life sustaining principle in flour. * * Some two or three years ago samples were procured from several parts of the Province of Manitoba for trial. The best of these was placed in the hands of some of our leading wheat growers for cultivation. One variety, Scotch Fife, yielded the first year, at the rate of thirty-seven bushels to the acre, of a hard amber color, which the wheat inspector of the Millers' Association at Minneapolis pronounced the finest specimen he had seen since he had been connected with the Association. Straw stood up stiff and strong, some of it being over five feet high, the heads were long, while the color of the growing grain was superb."

The above was scarcely in print when American buyers were in the country, and the whole surplus was bought up at a higher price than the Dakota wheat nearer home.

The following returns are given by some of the most respectable and intelligent farmers in the North-West, and are reliable. Where the average is below twenty bushels it must be remembered that the cause is generally newly broken land, or some misfortune to the crop:—

NAME.	ADDRESS.	YIELD PER ACRE.				Average Weight per bbl.
		1877.	1878.	1879.	1880.	
John Dilworth	High Bluff	25	20	23	25	61
George Cadman	"	30	28	25	40	60
William Jackson	"	25	30	30	25	62
William Eagles	Stonewall	25	20	24	25	65
S. C. Higginson	Oakland	25	29	26	30	62½
J. Sutherland	Kildonan E.	25	23	34	30	63
B. E. Mitchell	Cook's Creek	33	20	16	20	66
William Moss	High Bluff	35	35	35	40	60
William Owens	"	30	32	35	37	64
John Ferguson	"	30	32	31	30	61
John Airth	Stonewall	29	20	20	30	63
Robert Fisher	Cook's Creek	25	25	22	30	64
J. W. Adshhead	St. Charles	25	25	25	35	63
Robert Black	Bird's Hill	30	28	22	35	62

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NAME.	ADDRESS.	YIELD PER ACRE.				Average Weight per bu.
		1877	1878.	1879.	1880.	
James Arnison	High Bluff	35	34	32	35	62
William Corbett	Springfield	35	30	31	50	63
George Taylor	Poplar Point	25	25	30	35	60
John Brydon	Portage la Prairie	31	33	30	30	62
R. J. Moore	Nelsonville	27	24	23	28	61
J. Geddes	Kildonan	20	30	35	35	60
J. Macdonald	Gladstone	30	30	35	30	62
O. Gillespie	Plympton	10	28	35	25	64
A. P. Stevenson	Nelsonville	33	30	28	30	66
Edward Scott	Portage la Prairie	25	27	37	33	65
P. Ferguson	Gladstone	30	29	20	30	65
Max. Wilton	High Bluff	30	34	40	35	62
A. Dawson	Headingley	30	30	30	30	60
A. J. Hinkor	Green Ridge	25	17	23	25	65
F. Ogletree	Portage la Prairie	25	38	36	30	60
T. H. Brown	Poplar Point	30	20	18	27	60
G. A. Tucker	Portage la Prairie	25	27	27	23	63
A. V. Beckstead	Emerson	30	35	28	35	65
A. J. Nugent	West Lynne	20	20	18	25	58
W. B. Hall	Headingley	20	30	15	40	60
Charles Begg	Stone Fort	35	30	32	35	60
H. Granby	High Bluff	27	25	21	30	62
A. Polson, jr	Kildonan	25	30	25	30	65
G. Tidsbury	High Bluff	23	25	35	20	62
J. B. Robinson	Rockwood	24	28	20	35	61
Neil Henderson	Cook's Creek	30	30	30	35	65
Thomas Sigsons	Portage la Prairie	25	28	35	30	62
James Munroe	Kildonan	30	30	34	34	64
James Taylor	Headingley	15	16	8	15	60
T. Dalzell	High Bluff	26	25	33	20	64
William Hill	Woodland	15	20	15	25	62
J. Davidson	High Bluff	25	25	30	25	60
John Fraser	Kildonan	24	25	22	25	61
Alex. Adams	Clear Springs	38	35	30	40	62
John Hourie	St. Anne	20	34	18	30	61
C. Stewart	Meadow Lea	28	25	15	20	63
W. A. Farmer	Headingley	27	25	20	25	65
E. Burnell	Nelsonville	30	25	30	30	65
Robert Bell	Burnside	27	30	30	27	62
John McKinnon	Portage la Prairie	30	30	30	30	63
J. W. Carlton	Clear Springs	25	15	10	20	61
R. P. Bradley	St. Pio	30	32	40	25	65

Average yield, according to the above, was over twenty-six bushels per acre. Taking twenty-six bushels as the average yield of the Canadian North-West, we will compare this with American States:—

Canadian North-West	26 Bushels per Acre.
Minnesota	17
Massachusetts	16
Pennsylvania	15
Wisconsin	13

Iowa	10 Bushels per Acre.
Ohio	10 "
Illinois	8 "

These facts show the superiority of the Canadian North-West as a wheat-growing country. The weight of the wheat grown is also remarkable. Taking the heaviest samples of each country we find:—

Canadian North-West.....	66 lbs. per Bushel.
Minnesota.....	65 "
Ohio	60 "
Pennsylvania	60 "
Illinois	58 "

The Qu'Appelle region, partly surveyed last year, will be opened up this year by means of the Canadian Pacific Railway, and here in one block are at least 10,000,000 acres of wheat lands which hitherto have been almost unknown to the general public. Late surveys show that on the line of the Canadian Pacific Railway, 100 miles west of Brandon, lies the finest tract yet opened up, and having the warmest summer climate in the North-West.

At Prince Albert, 600 miles from Winnipeg, there is a large settlement and abundance of wheat is grown. Two steam grist mills and one portable mill at Duck Lake grind the flour required for the surrounding country. Owing to the influx of settlers and the necessity of supplying the Indians, flour has been bringing a high price, and no difficulty is found in disposing of the surplus.

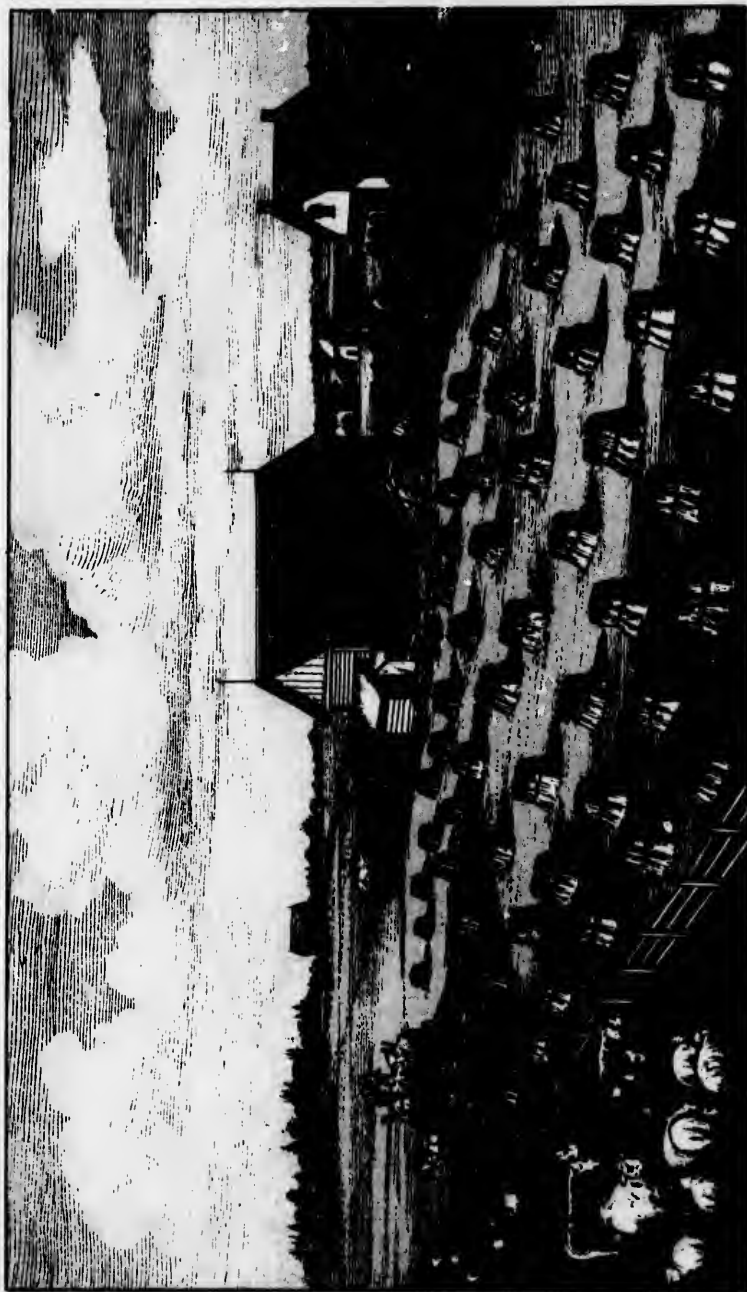
Almost 1000 miles from Winnipeg is the Edmonton settlement, and here farming is carried on extensively. Two steam grist and saw mills are in operation, and at this distant point they have regular Agricultural shows, where the various products of the country are exhibited. The correspondent of the Toronto "Mail," writing of the settlement last October, thus speaks of its appearance and products:—

"Edmonton is located on the north side of the Saskatchewan River, 200 miles north of Calgary, Bow River District,

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and 300 miles west of Battleford, more or less—decidedly more over the bad state of the roads when I travelled them. The view of the river approaching from the south is very fine. A plateau—the original level of the country—extends from each side of the river, and it is only when near the edge of the bank that the traveller recognizes the deep channel which he has to cross to reach the town, apparently only a few chains distant. Approaching a little nearer, however, he perceives a large valley and a magnificent river sweeping rapidly eastward and northerly around a curve which forms a plateau large enough for a small farm, and then losing itself in a gorge some distance below, near where steam rising from the smoke-stack of Edmonton Mills, gives evidence of progress and industry. The banks of the river at the ferry rise to nearly 200 feet, but the ascent is made by the benches and plateaux to the upper level, and so is tolerably easy." After describing the town site, the Hudson's Bay Fort and remarking on gold and coal mining, he proceeds with his description and says:—

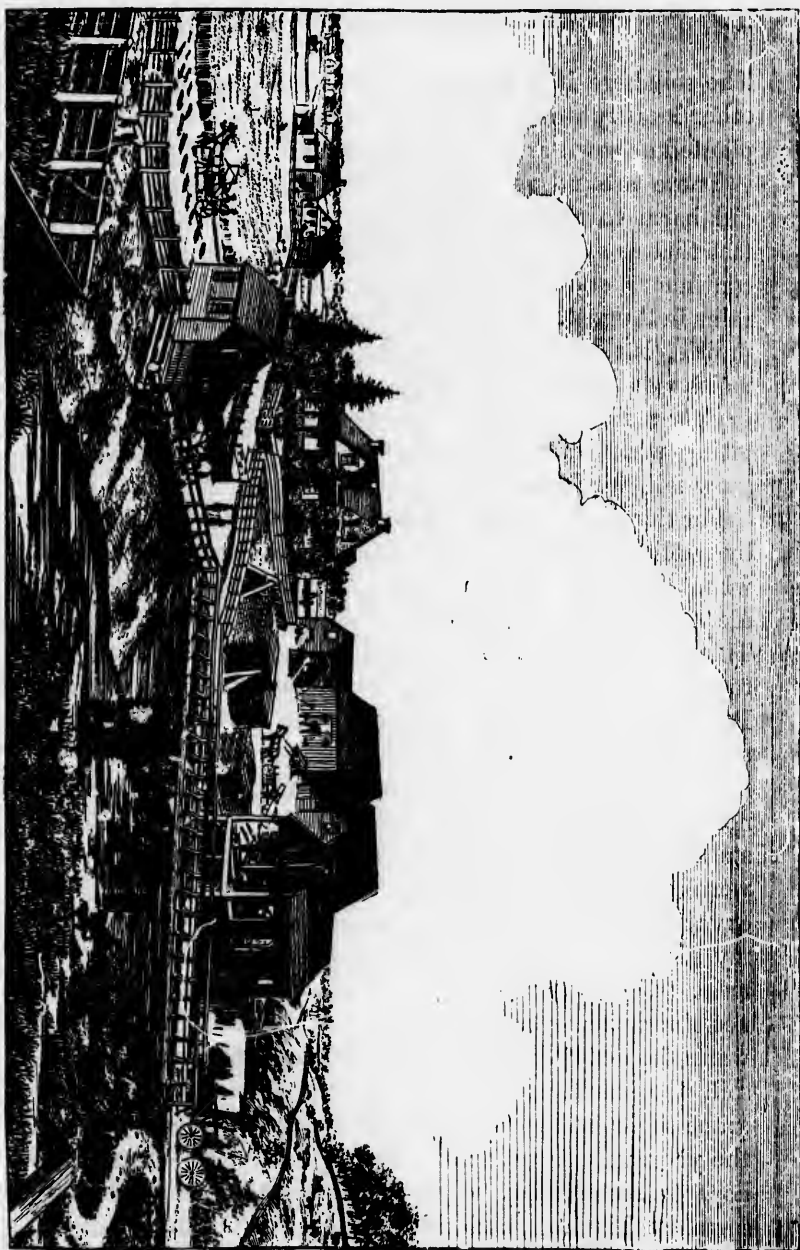
"Two steam mills for sawing and grinding have been erected at Edmonton * * * * It will thus be seen that the rich agricultural country in this neighbourhood will have ample accommodation for having their wheat ground, as well as opportunity of obtaining supplies of lumber for building purposes. But a short time since lumber had to be manufactured by hand labor, consequently was comparatively scarce. Now settlers can furnish their houses as economically as those 500 miles farther east. Whilst referring to the surrounding country, I may mention that the most extensive farmer in the district is Mr. Cust, whose farm is contiguous to the St. Albert's Mission. He is a native of the County Derry, Ireland, and has been on his present farm for five years. He had this year 180 acres of land under wheat, yielding thirty bushels to the acre; thirty-six acres barley, yielding thirty-six bushels to the acre on new

ground; and twelve acres of oats yielding, twenty-five bushels to the acre. The grain crop this past season has been lighter than former years, owing to cold, wet weather, altogether exceptional in this district until the past two years. His oats this year are only twenty-five bushels to the acre, which he considered only half a crop. Mr. Cust had twelve ploughs engaged last fall (1880) to do up the ploughing for spring crop whilst the good weather lasted. He has forty-four head of cattle, sixty hogs—twelve of them fit to be slaughtered next week."

Four hundred miles to the north crops are just as early as in the vicinity of Winnipeg, nine degrees or 650 miles farther south. While on Peace River, in 1875, I was enabled to collect information regarding the raising of grain along 770 miles of its course. Excellent potatoes were obtained on July 21st, in lat. 56° , and oats and barley ripened on the 12th August. Strange to say 400 miles to the north-east splendid barley was in the stock on the 6th of August, and wheat was ripe on the 12th. At Fort Vermilion, in lat. $58^{\circ} 24'$, I had a long conversation with old Mr. Shaw, who has had charge of the establishment for sixteen years. He said that frost never injured anything on that part of the river, and every kind of garden vegetables could be grown. Still farther to the north and east, at Little Red River, I found cucumbers, windsor and pole beans ripe, and was told that their summers were always warm and frost did no harm.

Chief Trader Macdougall says that Fort Liard, in lat. 61° N., has the warmest summer temperature of any place in the district, and that all kinds of grain come to maturity, and vegetables of every description could be raised with success. At Fort Chipweyan I obtained the wheat and barley which took the prize at the Centennial, and of the soil which produced it I wrote: "Less than two miles from the Fort is the French Mission, where I obtained the barley and wheat.





THIRTY YEARS IN THE BUSH.

The soil here is a mixture of humus and sand, and in any other locality would be considered valueless, but everything planted or sown around the Mission seems to flourish."

There are no records to show that spring frosts ever did harm to the growing grain. It is a well-ascertained fact that as soon as spring does come, fine, warm weather is continuous, and the only danger from frost is after heavy rains in August. Fall wheat will never be a success on the prairie, but there is no reason why it should not in the moister country to the north. Usually September is too dry for a fall growth on the open prairie, and besides, the biting winds of winter, and the clear sunshine and light snow fall, would destroy the crop.

For the last three years I have been advising settlers, both by public lectures and personal conversation, to sow their wheat and many garden seeds in the fall, say after the middle of October, instead of in the spring as they now do. This is the true fall sowing, and it has only to be tried once to prove its success. I was led to think of this while at Battleford, in 1879, by seeing a field of self-sown barley almost ripe before the other had headed out. In the same field there had been a potato patch the preceding year, and now it was overrun with seedling potatoes. Every potato stalk had produced an abundance of fruit and now the seeds were scattered and growing. During the fall, owing to the dryness of the atmosphere, there is scarcely any growth, and my advice is to sow so late that the grain cannot germinate. Owing to the dryness of the seed and soil, it cannot absorb water enough to cause it to rot. When the first warm days of spring come the snow melts and passes into the soil, the starch of the seed by this time has changed to grape sugar, and germination taking place at the same time, the young plants get a start that no drouth can injure. We hope to see the day when nearly all the wheat shall be sown at this time, and then August frosts can destroy no

more. About the 20th August there is a sudden lowering of the temperature, and all grain hard, at this time, is safe. Grain ripens slowly after this and is often injured by frost.

Last season there were two notable instances of fall sowing chronicled in the newspapers. Mr. Bannatine, of the city of Winnipeg, sowed wheat and carrots early in the preceding November, just a few days after I had advised it from the public platform in that city. In July last the wheat was two weeks ahead of spring-sowed grain, and doubtless it ripened two weeks earlier. The other instance is related by a correspondent of the Toronto "Globe," who, while at Edmonton last October, got the facts from Mr. Cust. His words are—"Like many other pushing and intelligent agriculturist in the North-West, Mr. Cust has come to the conclusion, that in future the safest and best plan of operations will be to do as much fall sowing as possible, that is, putting in spring crops in the fall, so that they will germinate during the first warm days of spring, and mature for harvest long before the early frosts that are liable to visit this part of the country can possibly reach them. I am informed that Mr. Reid, down at Fort Saskatchewan, has tried the experiment of sowing spring wheat in the fall, and that the results have been most satisfactory."

This is the true policy of settlers on the dry southern prairie where crops may suffer from a June drought, or those along the Saskatchewan where early frosts and cool winds are engendered by the proximity of forests or muskegs. As I have said fall wheat as sown in Ontario will never do on the prairie, but late fall sowing for spring growth will answer every purpose, and it requires no prophet to foresee it.

Much might be written about the future and calculations made regarding the wheat production of years to come, but such speculations are needless. In a very few years the crop will be limited by the means of export, and just as the carrying capacity of the roads increases, so will the crop.

No sane man can doubt this, for a glance at the map will tell him that there is actually no limit, but the want of a market, to the wheat crop of the North-West. When the rulers of England awake, as they soon must, to the fact that within the Dominion of Canada exist to-day, as virgin soil, three-fourths of the wheat lands of North America, and that it is to her they must look for their future supplies of food, whether it be beef or flour, we will receive that amount of attention and consideration which, as England's greatest colony, we deserve. What we want is men and money, and both these a judiciously framed emigrant policy on the part of Great Britain would give us. Year after year her people are passing by thousands into the United States, there to become alienated from the parent state, whilst one of her own colonies offers superior advantages, and reconciles every dissatisfied son to the old mother-land across the water. The hand writing is on the wall and few care to read it, but it stands there in flaming characters,—Give us land for it is the people's—it is ours. A few short years and the words change, and now they are —We take the land which is ours by our heritage of labor,—and we will get it. A few millions given now to assist emigration to the new North-West would relieve the pressure and convert rebellious sons into loving grateful children. There is land enough for all, and there is no reason why we should not receive men for our offer of free land.

Farmers' Testimony respecting the Soil.

NAME.	POST OFFICE.	DEPTH OF SOIL.
Ben Hartley	St. Charles.....	Black loam from 16 to 20 inches.
John Dilworth	High Bluff.....	" " 18 to 24 inches.
George Cadman	" "	" about 15 inches.
W. Jackson	" "	" " 18 inches.
A. Gillespie	Greenwood	My farm is chiefly bush land.
William Eades	Stonewall.....	Black loam 4 feet.
J. C. Higginson	Oakland.....	" 2 feet.
J. Sutherland	Kildonan East....	" from 3 to 10 feet.
Allan Bell.....	Portage la Prairie..	" " 18 inches to 2 feet.

NAME.	POST OFFICE	DEPTH OF SOIL.
James Sutton	Nelsonville.....	Black loam from 18 inches to 2 feet.
A. D. Cadenhead	Scratching River ..	I have dug 12ft. without reaching bottom.
Adam Nelson	Nelsonville.....	Black loam 18 inches.
A. J. Hinker	Green Ridge.....	" from 2 to 4 feet.
Rev. T. Cook	Westbourne	" about 1 foot.
F. Ogletree	Portage la Prairie..	" from 18 inches to 2 feet.
T. Hy. Brown	Poplar Point.....	" 18 inches to 2 feet.
G. A. Tucker	Portage la Prairie ..	" 12 to 18 inches.
A. V. Becksted.....	Emerson	" 3 to 4 feet.
A. C. Harvey.....	Poplar Point.....	" 18 to 24 inches.
G. C. Hall	Portage la Prairie ..	" 2 to 3 feet.
P. McKay	Portage la Prairie ..	" 3 to 4 feet.
D. G. L. we.....	St. Agathe.....	" 3 to 4 feet.
A. J. Nugent.....	West Lynne.....	" 4 to 5 feet.
W. B. Hall	Headingly.....	" 6 to 15 inches.
G. Turner	Lower Fort.....	" 6 to 36 inches.
J. G. Maley.....	Morris	" 24 to 30 inches.
A. Hepburn.....	Emerson	" about 3 feet.
A. Polson	Kildonan	" from 12 to 24 inches.
G. Tidsbury	High Bluff	" 10 to 36 inches.
James Fullerton	Cook's Creek.....	" about 20 inches.
F. B. Robinson	Rock Wood.....	" from 8 to 24 inches.
A. Nelson	Stonewall	" 12 to 36 inches.
W. Hill	Woodlands	" 12 to 18 inches.
N. McLeod	Victoria	" about 18 inches.
H. Hodgson	Springfield	" 4 feet.
J. S. P. Carsley.....	Ridgeville.....	" from 12 to 36 inches.
W. Alymer	St. Leon	" about 18 inches.
Joseph Dodds	Sunnyside.....	" from 18 to 24 inches.
John Hourie	St. Anne.....	" 24 to 36 inches.
P. Ferguson	Gladstone.....	" 3 to 4 feet.
C. Empson	Whynne	" about 18 inches.
D. Gillespie	Plympton.....	" 4 feet.
W. Grierson	Meadow Lea	" from 12 to 18 inches.
G. V. Fitzgerald	Bigville	" about 18 inches.

CHAPTER XIII.

Cereals, Root Crops, Seed Time and Harvest, Roads, &c.

Barley—Its great Weight in the North—Bay of Quinte Barley—Additional 100,000,000 Acres Suited to Barley North of the Wheat Belt—Uses of Barley in the West—Testimony Regarding its Culture in Manitoba—Average Yield for Four Years—Compared with the United States—Enormous Yield of Oats—Testimony of Residents in Manitoba—Average sixty Bushels per Acre—Nearly Three Times Greater than Ohio—100 Bushels per Acre often Raised—Potatoes a sure Crop to the Arctic Circle—Rotten ones Unknown—Chipweyans as Potato Cultivators—Remarkable size of Potatoes at Hay Lakes—Late Growth of Potatoes—Feeding Stock an Easy Matter—Pumpkins, Melons, and Cucumbers in the North—Melons Grow and Ripen North of St. Petersburg, or 1,200 Miles Northwest of Winnipeg and 900 Miles North of the Boundary—Extent and Capacity of the Country Beyond the Range of Average Comprehension—Testimony of Residents Regarding the Productive Powers of the Soil—Timothy an Excellent Crop—Good Fall Pasture—Wild Hops—Clover—Flax—Hemp—Why all Crops Succeed so Well—Southern Russia a Parallel Case—Commencement of Spring—Setting in of Winter—Seed-time in the North-West—Varies in Certain Localities—Harvest Time—Earliest in the Qu'Appelle Valley—Always Free from Frost—Qu'Appelle Valley Compared with Saskatchewan—Time for Taking up Roots—Testimony Regarding Seed Time and Harvest—Roads of the West merely Cart Trails—No real Roads other than Railways in the Country—Description of Leading Trails—How Trails are Formed—Where they Lead to—No Attempts made to Improve them—Travellers Tell of their Own Incapacity—Experienced men Never get "Stuck"—How to Cross a "slew" with Loaded Carts—Trails or Roads of Ten Years Since—How they were Formed—Indian Trails—Roads of the Future.

BARLEY as a crop cannot be over-estimated when speaking or writing regarding the North-West. Doubts may be cast on the successful cultivation of wheat in many parts, but regarding barley there can be no question, as it ripens fifteen days earlier and resists fall frosts better. It is a northern grain and reaches its highest development in the far North-West. Barley grown on Peace River weighs 58 lbs. to the bushel, and is so plump that it delights the eye of an Englishman when he sees it. Samples brought by myself from numerous points on the above river, were weighed in Winnipeg by the Inspector of Inland Revenue, and pronounced by him the finest in every sense he had ever examined

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It is well known to residents in Ontario that Bay of Quinte barley fetches a higher price in the United States than that raised south of the lakes. This is not so much owing to soil as to climate. The great heat of the south causes it to ripen before maturity, and consequently the grain is shrivelled. In the north although the days are hot the nights are cool and ripening is a slower process. If 150,000,000 acres be given as the approximate number of acres suited to wheat culture, another 100,000,000 acres could be added if the raising of barley be taken into account. On the shores of Hudson's Bay it has been raised for many years. A round every post south of the Arctic Circle, the Hudson's Bay Co's employés cultivate it. On the Youcon it has been grown for many years within the Arctic Circle. From every point the same report comes that the grain is in all cases plump and well filled up. As food for hogs and horses it cannot be beaten, and practical farmers seem to think it superior to oats for the one, and peas for the other. Within the settlements it is extensively sown, and outside of them it is the principal crop, as it can be used for food by both man and beast. That barley can be grown very successfully in Manitoba, will be shown by the following table. The quality of the grain is excellent, its color fine, and brewers pronounce it second to none for malting purposes.

Average Yield for four Years.

NAME.	ADDRESS.	YIELD PER ACRE.				Average weight per bushel.
		1877.	1878.	1879.	1880.	
John Dilworth.....	High Bluff.....	30	35	30	30	50
George Cadman.....	" ".....	42	40	36	35	48
W. Jackson.....	" ".....	40	40	40	35	48
A. Gillispie.....	Greenwood.....	60	66	70	—	50
John Sutherland.....	Kildonan.....	40	46	52	40	52
H. Bellenger.....	Cumberland Hse. lat. 54°	25	20	25	30	56
William Moss.....	High Bluff.....	50	50	50	50	50
M. Owens.....	" ".....	42	39	45	45	50

NAME.	ADDRESS.	YIELD PER ACRE.				Average weight per bushel.
		1877.		1879.	1880.	
John Ferguson.....	High Bluff.....	50	40	40	40	50
James Airth.....	Stonewall.....	40	40	05	—	56
J. W. Adshhead.....	St. Charles.....	20	20	20	30	50
J. Armson.....	High Bluff.....	65	50	55	55	48
John Brydons.....	Portage La Prairie.....	40	35	45	35	50
A. J. Moore.....	Nelsonville.....	53	47	43	50	50
A. Macdonald.....	Gladstone.....	38	38	40	50	50
A. P. Stevenson.....	Nelsonville.....	50	40	45	50	50
Max. Wilton.....	High Bluff.....	40	40	48	40	52
A. J. Hinker.....	Green Ridge.....	48	45	50	60	57
F. Ogletree.....	Portage La Prairie.....	30	30	30	30	50
A. V. Beekstead.....	Emerson.....	50	50	60	55	50
Charles Iegg.....	Stone Fort.....	40	40	30	40	50
G. Granby.....	High Bluff.....	40	30	50	40	52
Alex. Polson, Jr.....	Kildonan.....	30	30	30	35	52
George Tidsbury.....	High Bluff.....	35	33	36	30	50
T. B. Robinson.....	Rockwood.....	52	30	20	40	50
Thomas Sigsons.....	Portage La Prairie.....	30	32	36	28	50
James Munroe.....	Kildonan.....	40	40	40	45	50
John Fraser.....	".....	50	50	40	45	50
Alex. Adams.....	Clear Springs.....	75	40	18	60	50
John Hourie.....	St. Anne.....	50	40	20	30	52
W. A. Farmer.....	Headingley.....	34	31	20	40	51
James Whimster.....	High Bluff.....	40	36	42	50	52
James Stewart.....	".....	30	25	25	25	50
J. W. Carleton.....	Clear Springs.....	60	50	25	30	50
Matthew Owens.....	High Bluff.....	42	39	45	45	50
Nelson Brown.....	".....	40	30	20	30	48
John McKinnon.....	Portage La Prairie.....	50	50	60	50	50

Average yields according to the above, and many other instances for 1877 were 43, 1878, 38, 1879 39 and 1880, 41 bushels per acre.

The following statement tells its own tale:—

Canadian North-West, say	40 bushels per acre.
Minnesota.....	25 " " "
Iowa.....	22 " " "
Wisconsin.....	20 " " "
Ohio.....	19 " " "
Indiana.....	19 " " "
Illinois.....	17 " " "

Throughout the North-West Territories barley is a sure crop, and the farther you proceed to the northwest, the plumper the grain and the greater the yield. For malting purposes no finer barley can be found in the world.

Oats produce enormously, and are very plump. Their

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D. G.
A. P.
Jame
Ed. S.
P. Fu
F. Og
T. H.
G. A.
A. V.
A. J.
H. B.
G. Gr
Alex.
Thom
Jame

straw and that of wheat and barley is wonderfully bright, tall, and stout. A look over a field of growing grain is all that is necessary to tell the practical man that here is a land with untold wealth in its soil, and as the life giving breeze fans his cheek, he feels that here life means an unending pleasure. The blood courses through his veins as it did when he was a boy, and he is young again in spirit if not in years. The sensation is irresistible, and all men feel never to be forgotten pleasures as they gaze on the waving fields of grain and prairie grass. It is not too much to say that everything is instinct with life. The following table will show that oats at any rate are very prolific:—

Average Yield for four Years.

NAME.	ADDRESS.	AVERAGE PER ACRE.				Average weight per bush.
		1877.	1878.	1879.	1880.	
John Diltworth.....	High Bluff.....	69	75	60	70	40
W. Jackson.....	".....	75	75	80	60	35
W. Eagles.....	Stonewall.....	40	35	35	40	35
S. C. Higginson.....	Oakland.....	55	50	60	60	39
John Sutherland.....	Kildonan.....	54	57	58	50	38
R. E. Mitchell.....	Cook's Creek.....	30	35	50	60	38
Wm. Moss.....	High Bluff.....	60	60	60	70	36
M. Owens.....	".....	70	60	60	57	42
John Ferguson.....	".....	75	70	65	65	36
R. Fisher.....	Stonewall.....	62½	45	45	50	38
J. W. Adshead.....	St. Charles.....	100	—	85	80	33
Robt. Black.....	Birds Hill.....	52	45	60	65	42
James Armison.....	High Bluff.....	80	85	75	75	42
Wm. Corbett.....	Springfield.....	75	60	65	65	38
J. G. Rent.....	Cook's Creek.....	30	30	55	40	38
John Brydon.....	Portage la Prairie.....	75	80	68	70	38
A. J. Moore.....	Nelsonville.....	60	56	60	50	36
J. Geddes.....	Kildonan.....	40	35	40	40	34
A. McDonald.....	Gladstone.....	40	40	40	40	36
D. Gillespie.....	Plympton.....	15	60	80	60	40
A. P. Stevenson.....	Nelsonville.....	100	100	80	75	40
James Stewart.....	Cook's Creek.....	37	37	40	50	40
Ed. Scott.....	Portage la Prairie.....	60	55	60	65	35
P. Ferguson.....	Gladstone.....	60	70	90	75	36
F. Ogletree.....	Portage la Prairie.....	75	60	60	50	38
T. H. Brown.....	Poplar Point.....	60	40	40	60	34
G. A. Tucker.....	Portage la Prairie.....	60	40	50	60	37
A. V. Becksted.....	Emerson.....	75	100	90	60	40
A. J. Nugent.....	West Lynne.....	50	50	60	60	34
H. B. Hall.....	Headingley.....	80	80	80	100	40
G. Granby.....	High Bluff.....	65	70	73	65	38
Alex. Polson, Jr.....	Kildonan.....	40	50	50	50	38
Thomas Sigsons.....	Portage la Prairie.....	60	62	52	65	38
James Munroe.....	Kildonan.....	90	75	60	60	40

NAME.	ADDRESS.	AVERAGE PER ACRE.				Average weight per bsh.
		1877.	1878.	1879.	1880.	
John Taylor.....	Headingley.....	25½	30	25	30	35
Thomas Dalzell.....	High Bluff.....	95	80	75	80	40½
J. Davidson.....	".....	60	80	75	80	36
Alex. Adams.....	Clear Springs.....	50	74½	65	70	38
John Hourie.....	St. Anne's.....	40	60	40	40	38
Charles Stewart.....	Meadow Lea.....	70	60	60	20	36
W. A. Farmer.....	Headingley.....	52	51	50	60	40
J. Stewart.....	High Bluff.....	65	75	75	75	41
Robt. Bell.....	Burnside.....	75	75	75	75	36
Jas. Sinclair.....	Greenwood.....	54	50	50	55	40
M. Ferris.....	Burnside.....	50	45	50	40	40
J. W. Carlton.....	Clear Springs.....	35	40	45	35	36
M. Owens.....	High Bluff.....	70	40	60	57	42
Nelson Brown.....	".....	80	80	60	50	34
R. P. Bradley.....	St. Pie.....	60	80	90	70	40
John McKinnon.....	Portage la Prairie.....	50	50	50	60	38
John Winster.....	High Bluff.....	85	80	85	80	—

The average yield for the four years ranges from 58 to 62 bushels per acre. The comparison between the Canadian North-West and some of the American States as respects the yield of oats is as follows:—

Canadian North-West, say average 60 bushels per acre.		
Minnesota	37	"
Iowa.....	28	"
Ohio	23	"

The oats grown are very superior in quality, being plump and heavy, averaging in weight about 38lbs. to the bushel. The yield per acre is simply enormous, an average of over eighty bushels to the acre being no uncommon thing, and in a few exceptional cases even one hundred bushels have been realized. For newly broken ground, I am of opinion that oats will be found the most remunerative crop, and there is always a ready home market for all that can be raised.

Evidence is at hand to show the enormous crops of potatoes that are raised. Some specimens have been obtained weighing over five pounds each, and it is no unfrequent occurrence to have 600 bushels to the acre. When it is considered that potatoes range in price from 80 cents to \$1.50 per bushel, it is no exaggeration for a Manitoba farmer to say that he could make more with a potato patch in the

North-West than he could with a large farm in Ontario. The average yield of over 100 instances for 1877-80 inclusive was 318 bushels to the acre.

Potatoes in every part of the country are a sure crop, growing along the shores of Hudson's Bay, and producing a fair average at Fort Good Hope, on the Mackenzie River, north of the Arctic Circle. In my travels up and down the country I never saw a rotten one, and never came on a tract where they would not succeed. In the forest country north of the Saskatchewan, the Chipweyans locate themselves on the banks of the various rivers and lakes, erect houses, put in a small patch of potatoes, carrots, and turnips, and during the latter part of the summer and fall, revel in luxuries, having the finest whitefish for the taking and lovely potatoes for the gathering. Everywhere it is the same, and whether the soil is clay, loam, or sand, crops beyond description are taken off without costing the cultivator one tithe of the labor required in the east.

In 1879, while at Hay Lakes, 800 miles west of Winnipeg, I went into a potato field and measured two specimens of two varieties. The white variety measured on an average $17\frac{1}{2}$ inches and the purple variety $15\frac{1}{2}$ inches, in circumference. Two measurements were taken in each case, and the length was only an inch greater than the breadth. This was on the 26th September and many of the leaves were still green. At Isle La Crosse Lake, in lat. 57° north, I found potatoes still growing on September 22nd, 1875, and I had the pleasure of eating new potatoes in the shadow of the Rocky Mountains, in lat. $56^{\circ} 12'$ north, on the 21st of June of the same year.

Feeding stock with roots will be an easy matter, as the crops of turnips and carrots are simply amazing. These grow everywhere in the north, and always give large returns. Governor Morris told me that he saw fine pumpkins and melons growing at the north end of Lake Winnipeg.

I found quantities of ripe cucumbers at Little Red River, grown from English seed, in lat. $58^{\circ} 30'$, on the 14th August, 1875. At Fort Simpson, Mr. Hardisty informed me that they grew melons every year, and had no difficulty with them when started under glass. This Fort is situated at the confluence of the Liard and Mackenzie Rivers, north of Great Slave Lake, and is situated in lat. 62° , or two degrees further north than St. Petersburg. The great extent of country under discussion may be realized when I state that the above locality (Fort Simpson) is over 1200 miles, as the crow flies, northwesterly from Winnipeg, and is due north of the American boundary over 900 miles. It is extremely difficult for one unacquainted with the subject to grasp the extent and capacity of the country. It is practically boundless as far as this generation is concerned, and long after our bones are mouldered into dust there will still be millions of acres untrodden by the foot of the husbandman. Pages could be written at this point filled with what would seem highly-colored and extravagant adjectives, and yet these would not reach the reality. The potential powers of the soil can be best illustrated by letting the residents speak for themselves:—

W. H. J. Swain, of Morris,

Has produced 800 to 1000 bushels of turnips to the acre, and sixty bushels of beans have also been raised by him per acre.

S. C. Higginson, of Oakland,

Has produced cabbages weighing $17\frac{1}{2}$ lbs. each.

Allan Bell, of Portage la Prairie,

Has had cabbages forty-five inches in circumference, and turnips weighing 25 lbs. each.

Thomas B. Patterson,

Has realized forty tons of turnips to the acre, some of them weighing as much as 20 lbs. each.

Robert E. Mitchell, of Cook's Creek,

Raised a squash of six weeks growth, measuring five feet six inches around the centre.

William Moss, of High Bluff,

Has produced carrots weighing 11 lbs. each, and turnips measuring thirty-six inches in circumference.

James Airth, of Stonewall,

States that the common weight of turnips is 12 lbs. each, and some of them have gone as high as $32\frac{1}{2}$ lbs.

Isaac Casson, of Green Ridge,

Has raised 270 bushels of onions to the acre.

John Geddis, of Kildonan,

States he has raised 300 bushels of carrots and 800 bushels of turnips per acre.

John Kelly, of Morris,

Has produced 800 to 1000 bushels of turnips to the acre.

Joshua Appleyard, of Stonewall,

Also states his crop of turnips to have been 1000 bushels per acre, the common weight being 12 lbs. each.

Edward Scott, of Portage la Prairie,

Raised 400 bushels of turnips from half an acre of land.

W. H. J. Swain, of Morris,

Had citrons weighing 18 lbs. each.

Francis Ogletree, of Portage la Prairie,

Produced onions measuring $4\frac{3}{4}$ inches through the centre.

A. V. Beckstead, of Emerson,

Gives his experience as follows:—Mangle Wurzels weighing 27 lbs. each, Beets 23 lbs., Cabbages 49 lbs., Onions each $1\frac{1}{2}$ lbs. in weight.

W. B. Hall, of Headingly,

Has raised carrots three inches in diameter, beets weighing 20 lbs. each, and gives the weight of his turnips generally at 12 lbs. each.

Philip McKay, of Portage la Prairie,

Took 200 bushels of turnips from one quarter of an acre of land, some of them weighing 25 lbs. each. He has produced carrots four inches in diameter and fourteen inches long, has had cabbages measuring twenty-six inches in diameter, solid head, and four feet with the leaves on. His onions have measured 16 inches in circumference, and cauliflower heads nineteen inches in diameter.

James Laurie & Bro., of Morris,

Have produced turnips thirty inches in circumference, onions fourteen inches and melons thirty inches. He had one squash which measured about the same size as an ordinary flour barrel.

James Owens, of Point du Chêne,

Had turnips 30 lbs. each, onions fourteen inches around, and cucumbers eighteen inches long.

Neil Henderson, of Cook's Creek,

Has raised 1000 bushels of turnips to the acre, carrots five inches in diameter and eighteen inches long, while his onions have frequently measured five inches through.

James Bedford, of Emerson,

Has raised 1000 bushels of turnips to the acre.

It must be remembered, that none of the farmers mentioned above used any special cultivation to produce the results described, and out of nearly 200 reports which we have received from settlers concerning the growth of roots and vegetables in the North-West, not one has been unfavorable.

Timothy has been grown for many years by farmers in the older settled parts of the country, and all with one accord speak highly of it as a crop. Thomas Dalzell, of High Bluff, has grown timothy for eight years, and says he has had from two to three tons to the acre. It is often seen growing alongside the track on the prairie, and unlike the wild grasses the root leaves are always green. In the fall of 1880 this was notably so between Rat Creek and Portage la Prairie, where cattle were out on the timothy stubble eating the green leaves in the beginning of November. In the latter part of the same month, the preceding year, white clover and timothy were quite green along the roadside east of Portage la Prairie. Red clover must produce enormously, as many species of plants closely related to it grow everywhere in the country.

Wild hops are known to produce large quantities, said to be equal if not superior to any seen in cultivation. Flax and hemp were formerly cultivated, and produced large crops. Hemp has been grown twelve feet high. In the future, large areas will be sown with these plants, as their fibre will be utilized for many purposes, and flax seed will be required for making oilcake for fattening stock.

The reason why all manner of vegetables succeed in the North-West is not far to seek. As has been shown in the

preceding chapter, the soil is the best in the world. The light rainfall prevents the land from becoming sour, and the severe and continued frost pulverizes the soil deeper than any other subsoiling process could possibly do. A rich soil, an unequalled seed-bed, a superior seed time, plenty of rain in the growing season, long sunny days, and clear dewy nights combine to produce crops of all sorts that cannot be equalled.

Southern Russia has long been noted for the richness of its soil and its extraordinary crops of wheat. Our North-West is under the same parallels of latitude, is known to be a country of summer rains, and to have every peculiarity of the Russian Plain. Russia in past years has been famous for its wheat, shipped from Odessa. Riga is the port from which hides and tallow, hemp, flax, oilcake, linseed oil, and many other products have come, and it is not claiming too much to expect that our North-West will supply all these in coming years. We have all the natural facilities, but we want men to till the soil.

The questions put to people acquainted with the country are—When does spring commence? When does winter set in? When do you sow your seed? What time does harvest commence? When do you take up your roots?

From Winnipeg to Peace River, points fully 1300 miles apart, spring commences about the same time. Taking one year with another, the first spring flowers make their appearance about April 15th. Captain Butler found the whole hillside covered with beautiful Anemones (*Anemone patens*) on April 22nd, in lat. 56° north. The same year spring commenced in the neighborhood of Winnipeg at the same date. Red River, in lat. 48°, does not break up earlier than the middle of April, and Peace River, eight degrees further north, is not later.

Winter sets in, as far as the closing of Red River is concerned, some time during the first ten days of November.

Peace River closes much later, as it is only at this date that the first ice is seen in the river. Often very cold weather comes in October, and snow lies on the ground for eight or ten days, but it passes away and usually a beautiful season commences which lasts far into December. At this time the nights are more or less frosty, with clear, calm and most delightful days. The latter part of December and January are generally very cold, and during this period the thermometer falls very low.

Seed time in the North-West continues from the first of April to the middle of June, that is from the very earliest time when seeding can take place to the latest period when it is wise to sow. At Battleford seeding has been done in March, but this is so exceptional that it should only be noticed. After talking with many farmers, I found that May is the general time for all spring work, but that wheat sowed as late as June 10th generally escapes the frost, and that barley will produce a crop ten days later. All good farmers say that grain should not be sown later than June first. On Peace River, in lat 56°, work commences about April 20th, and after this time potatoes are planted, and grain sown. Still farther north, at Vermilion, there is little gardening until after the first of May. At Fort Chipweyan, on Lake Athabasca, scarcely anything is done until May 10th. About 90 days are required on Peace River to ripen barley, but early sown seed takes less time.

Harvest depends altogether on the time of sowing. Early sown grain ripens in fewer days than late sown, as it has all the hot weather to mature in. A great and permanent fall of temperature always takes place about the middle of August, and after this grain is slow to ripen.

Throughout the whole valley of the Qu'Appelle, spring time and harvest time are earlier than in Manitoba. This is partly caused by the warmer soil and drier atmosphere of that region. In 1879 strawberries were in abundance

by the middle of June at Fort Ellice. The spring was fully ten days earlier than at Winnipeg. At Qu'Appelle 130 miles west of Fort Ellice, Mr. Marcus Smith, C. E., found "barley cut and stored by July 27th" in the same year. From time immemorial Indian corn has been grown in the valley, and all kinds of garden vegetables are cultivated by the Missionaries. Mr. Sette the English Church Missionary on the Little Touchwood Hills, says that in that section crops are always cut early and never injured by frost. At Prince Albert, wheat ripened the same year about the middle of August, and at Battleford a few days earlier. Edmonton was later, and it seems a settled matter that there are from twelve to twenty days difference in the ripening of grain between the valley of the Qu'Appelle and that of the Saskatchewan.

Potatoes are stored by careful people before the 10th October, as after this date there may come a few days of hard frost, and do much injury to them. Beets require to be cared for at the same time, but carrots and turnips can be left till November. Root cellars are easily constructed and there is no difficulty in saving all kinds of roots. Many farmers in the west take up their potatoes in the latter part of September, and experience shows that this is the safest plan. I subjoin a few statements from settlers regarding seed time and harvest. These all refer to Manitoba.

John McKinnon, Three Creeks, Portage la Prairie, says:—

"The usual time of sowing wheat, oats, and peas is from the beginning of April to the middle of May, barley from middle of May till the beginning of June. The weather during seeding and harvest is generally dry. The usual time to harvest is from the middle of August till September."

John W. Carlton, of Clear Springs, says:—

"Land ought to be ploughed in the fall, and sown as early as possible in the spring. Seeding is from 10th to 15th of April, and harvest from 10th of August to 15th September: The Mennonites here grow all their tobacco, and it stands about four feet high."

James Sinclair, of Greenwood, says:—

"The month of May is generally fair; June wet, August and September fair weather. All kinds of roots and vegetables should be sown as early as the ground is in fit condition, and will be fit for gathering about the middle of October."

Henry West, of Clear Springs, says:—

"I have been in the country six years, and have found the driest summers to give the best crops, even though there was no rain except an odd thunder storm."

H. C. Graham, of Stonewall, says:—

"Spring weather, at time of seeding, is generally bright, with some warm showers of rain. In harvesting we rarely have rain; usually clear fine days."

Arthur J. Moore, of Nelsonville, says:—

"The weather in April and May is usually dry and clear. A good deal of rain in June, is followed by a very dry and fine harvest, which usually commences in the second week in August. Have grown buckwheat successfully. Have seen good crops of flax amongst the Mennonites. Timothy and clover do well. Planted twenty apple trees two years ago which are doing well."

F. T. Bradley, of Emerson, says:—

"I cultivate wheat, seldom raising other grain: This season (1880) I commenced seedings April 10th, season being backward did not finish seeding till 5th of May, and then had eighty acres under crop: Commenced harvest on August 9th, expect an average of thirty bushels to the acre."

Thomas Henry Brown, of Poplar Point, says:—

"Plough as much land as you can in the fall, and sow as early as the frost is out of the ground, just enough for the harrow to cover the seed: As far as my experience goes the ordinary vegetables, such as turnips, carrots, cabbage, onions, beets, peas, beans, &c., grow well here. I have raised as good vegetables since I have been here, with comparatively but little cultivation, as I have seen raised in my native place, County Kent, England, where market gardening is carried on to perfection."

Questions are constantly asked about roads, and most writers speak of the *roads* in anything but complimentary terms. The truth is there are *no* roads in the country. What are familiarly called roads are merely the trails used by buffalo hunters and Hudson's Bay Company's employés when traversing the country from point to point. As settlers came into the country they used these trails and began to locate in their vicinity. While the prairie remained un-

inclosed the roads were excellent except at a creek crossing or a low marshy spot, in the language of the country termed a "Slough" or "Slew." The *brigades* of Red River carts, often one hundred in number, travel in single file, each cart drawn by one horse or ox, and carrying from eight to ten hundred weight. A road, then, originally consisted of two rut-marks on the prairie sod and a path between. As traffic increased these ruts would wear deep into the soil and one or more new ruts would be formed by keeping one wheel in the former track. On the main trail to Battleford and Edmonton twenty such ruts can now be counted running parallel to each other.

Within the settlements, road allowances are now more or less inclosed, and by constant travel the prairie sod has been cut completely away. This makes the roads almost impassable in the wet weather in June and July. Some attempts have been made to improve them by building bridges over the creeks and in some cases making a "turnpike" by digging a ditch on either side of the road and throwing the earth into the centre. This, when levelled, makes a capital road in dry weather, but when rain falls it is simply indescribable. Outside of Manitoba no attempts whatever have been made to either bridge a creek or drain a slough so that each traveller does the best he can.

Travellers seem to delight in recording their difficulties and give astounding details of how many times they got "stuck" in a quagmire or floundered through a creek, and relate these incidents with great unction. To an experienced traveller all this is merely a record of their own ignorance and inexperience, for the man who has his wits about him never gets "stuck" in these places but avoids them by not trying to pass one without examination. We, who are accustomed to prairie travelling, laugh at the woe-begone looks of the green horns who get into a "slew" and spend hours getting out again. The proper way to pass one

of these places, in the wet season, is to get to one side of the usual trail and have a man to lead the horse through with his feet on the broken grass and uncut sod and at least one wheel on a new track. Should the first horse break through a little grass thrown into his tracks will carry the next one across. Besides the man leading the horse another should be on each side of the cart ready to assist. Having travelled many thousand miles on the prairie by compass and passed every obstruction, even rivers nearly half a mile wide without any assistance other than our own ingenuity, I can say that prairie travelling is an exceedingly simple matter when a few grains of common sense are included in the process.

Ten years ago there were very few trails in the country other than those made by the Indians. The main trail for the west started from Winnipeg and at Portage la Prairie forked. One branch went by the White Mud past Westbourne, Palestine, Gladstone, and Odanah and met the other a few miles east of Salt Lake. The other road, called the South Trail, continued to the west, crossed Rat Creek and McKinnon's, and passed on to the "Big Plain" beyond Pine Creek. Here a branch left the trail and going still farther south crossed the Assiniboine at Brandon and passed up the right bank of the river to Fort Ellice. At Brandon a branch went still farther south and lost itself on the Souris Plain. From the "Big Plain" the road continued westward joining the north trail at the above mentioned point. Passing Shoal Lake and Birtle it struck the Assiniboine above the mouth of the Qu'Appelle. Crossing the river it continued on northwesterly to the Touchwood Hills and thence to the South Saskatchewan. Crossing it at Batoche's ferry, the trail passed by Duck Lake to Carlton. Here it again forked, and one branch crossed the north Saskatchewan and continued up to Edmonton. The other passed in the direction of Battleford and on to Edmonton. This southern road was

seldom travelled ten years ago, as fears were entertained of Indian raids. From Edmonton the trail continued 90 miles farther to Fort Assiniboine on the Athabasca River.

Fort Ellice was a central point, and trails passed from it to every point. One went up the right bank of the Assiniboine to Fort Pelly, 140 miles to the north. Another passed to the west and threw off a branch when opposite Qu'Appelle, which passed through Qu'Appelle and north to the Touchwood Hills. The main trail passed westward to Moose Jaw Creek and from thence to the Cypress Hills where it ceased or merged into another which followed the right bank of the South Saskatchewan from Batoche's ferry to the country on the Milk River. From Fort Ellice another led to the southwest, by Moose Mountain to Wood Mountain, and was the usual route taken by the Half-breeds when going out to hunt the buffalo. Of late years many cross trails have been added to these, but with the exception of the above, and a trail leading south from each of the Hudson's Bay Company's forts on the Saskatchewan to the buffalo plains, scarcely any others existed.

These trails were seldom direct. Travellers had to meander from side to side according as wood and water could be found. Indian trails on the contrary led from hill top to hill top and anywhere on the buffalo plains a high hill has an Indian trail passing over or near it. Often, when travelling without a trail, we have been able to strike one almost parallel to our line by studying the topography of the country, and deducing the direction in which they should run.

On the prairie west of the Red River Valley, roads such as we have in Ontario will never be needed as the soil is naturally dry and only during the month of June is the rainfall great. In the fall, winter, and spring, all roads are in good order and will remain so when the mud holes are ditched and drained. The future traffic roads are iron ones and all others will be built with local labor as the country roads of Ontario are constructed.



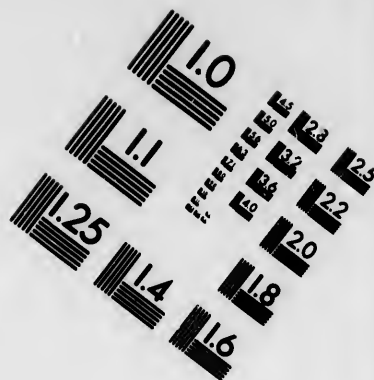
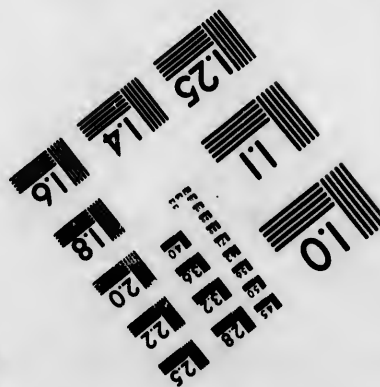
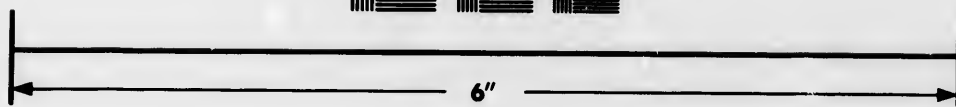
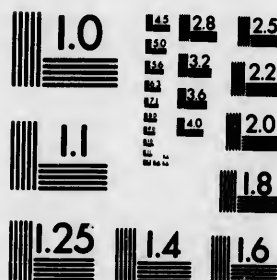


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CHAPTER XIV.

Grasses of the Plains, Forests, and Mountains.

Pastures of the Prairies—Their Value in Various Sections—Design of the Chapter—List of Grasses, their Habitats—List of Cyperaceæ, their Habitats—List of Rushes—List of Leguminosæ (Pea Family)—Why Certain Grasses have Various Names—Effects of Burning the Grass—"Wild Oat" of Southwestern Manitoba a Bugbear—Sheep Killing by its Awns a Myth—Description of the Grass—How it Injures Man or Beast—Hay made of this Grass—Its Effects on Horses—Really the best Grass on the Plains—Hay Grasses—Manitoba Hay—Practical Remarks on Manitoba Hay—Testimony of Residents Regarding the Hay Crop—Sand Hill Grasses—Bunch Grasses—Buffalo Grasses—"Grama-grass"—Grasses of the Alkali Lands—Valuable Grasses—Grasses of the Bow River Country—Spring Food of Horses—Summer Food—Winter Grass of the Prairie—Winter Pasture in the Forest—Only one Poor Grass in Ninety-six—Value of the Pea Family—*Artemisia Frigida* as a Forage Plant—*Eurota lanata*—Analyses of Grasses.

ALL the prairie is pasture land, but all is not equally good pasture. The pastures that are exceptionally good this year will be poor the next. The pasture on burnt prairie is good all summer. But this cannot be said of the which is unburnt. The same species of grass extend through 20° of longitude and sometimes 10° of latitude, and a grass spoken of very highly in one locality may be condemned in another. The pastures of Bow River are highly praised while those farther east with the same species are despised, because public opinion has not been roused in their favor. I purpose in the following list to give *all* the grasses of the plains, so that both scientific and practical men may recognize the value of those wonderful pastures, extending for nearly 1,000 miles from east to west. Following the true grasses I shall give the Cyperaceæ or sedges which constitute much of the hay and the greater part of the vegetation of the ponds, and lastly a list of the Leguminosæ, which include the vetches, peas, and all other plants of the order looked upon in all lands as of the most nutritious character. As so little is known

of the real value of the grasses and other plants of the region I shall collect analyses of a number of the grasses and show their comparative value for feeding purposes. If space permit, either in this chapter or those devoted to stock-raising, I shall more particularly describe a few of the prominent grasses.

Table I. *List of Grasses.*

BOTANICAL NAME.	COMMON NAME.	PLACE OF GROWTH.
<i>Leersia oryzoides</i> .	Rice Grass.	Wet places, eastward.
<i>Zizania aquatica</i> .	Wild Rice.	Lake of the Woods.
<i>Alopecurus aristulatus</i> .	Wild Water Foxtail.	In wet places near ponds.
<i>Phleum alpinum</i> .	Wild Timothy.	Cypr. and Porcupine Hills.
<i>Vilfa cuspidata</i> .	Rush Grass.	Damp prairies.
<i>Sporobolus heterolepis</i> .	Drop-seed Grass.	Abundant eastward.
" <i>cryptandrus</i> .	Hidden Drop-seed.	Sand hills.
" <i>asperifolius</i> .	Rough Leaved Drop-seed.	Rich dry soil.
<i>Agrostis scabra</i> .	Tickle Grass.	River banks.
<i>Cinna arundinacea</i> .	Wood Reed Grass.	Cool moist woods.
<i>Muhlenbergia glomerata</i> .	Drop-seed Grass.	Boggy and rich soil.
" <i>sylvatica</i> .	Sylvan Muhlenbergia.	Eastern Manitoba.
<i>Calamagrostis stricta</i> .	Reed Bent Grass.	Very common, moist ground.
" <i>longifolia</i> .		Sandy soil.
" <i>Canadensis</i> .	Blue Joint Grass.	Water pools and forest.
" <i>Langsdorffii</i> .		Forest marshes.
" <i>sylvatica</i> .		Rocky Mountains.
" <i>Porteri</i> .		Rocky Mountains.
<i>Ericoma cuspidata</i> .		Sand hills, in bunches.
<i>Oryzopsis Canadensis</i> .	Canada Rice Grass.	Cypress Hills.
" <i>asperifolia</i> .	Rough Leaved Rice Grass.	Northern forest.
<i>Stipa spartea</i> .	"Wild Oat," Buffalo Grass.	Very abundant.
" <i>viridula</i> .	Feather Grass.	Very common.
" <i>Richardsonii</i> .		Foot Hills, Rocky Mount.
" <i>comata</i> .		Rather scarce.
<i>Spartina gracilis</i> .	Graceful Salt Marsh Grass.	Abundant, salt marshes.
" <i>glabra</i> .	Salt Marsh Grass.	Rare, western plains.
" <i>cynosuroides</i> .	Fresh Water Cord Grass.	Manitoba, very common.
<i>Bouteloua oligostachya</i> .	Buffalo Grass.	Southern or dry plains.
<i>Graphophorum melicoides</i> .		Cypress Hills.
" <i>festuaceum</i> .		Fresh water pools.
<i>Koeleria cristata</i> .		Dry hills and river banks.
<i>Eatonia obtusata</i> .		By pools.
" <i>Pennsylvanica</i> .		Moist woods.
<i>Melica Hallii</i> .	Hall's Melic Grass.	Brandon and westward.
<i>Glyceria airoides</i> .	Narrow Leaved Spear Grass.	Salt marshes.
" <i>tenuiflora</i> .	Meadow Spear Grass.	Salt marshes.

BOTANICAL NAME.	COMMON NAME.	PLACE OF GROWTH.
<i>Glyceria nervata</i> .	Water Spear Grass.	Damp pastures and pools.
" <i>aquatica</i> .	Common Manna Grass.	In pools.
" <i>fluitans</i> .		In standing water.
" <i>distans</i> .		Salt marshes.
" <i>pauciflora</i> .		Northern river bottoms.
<i>Brizopyrum spicatum</i> .	Spike Grass.	Salt marshes.
<i>Catabrosa aquatica</i> .		In spring rivulets.
<i>Munroa squarrosa</i> .		Red Deer Valley.
<i>Poa annua</i> .	Annual Spear Grass.	Near Winnipeg.
" <i>pratensis</i> .	June Grass.	Very common.
" <i>tenuifolia</i> .	Slender leaved Poa.	Fine pasture grass.
" <i>alpina</i> .		Cypress Hills.
" <i>serotina</i> .	Foul Meadow.	Abundant in wet places.
" <i>laxa</i> .	Wavy Meadow Grass.	Manitoba prairies.
" <i>Andina</i> .		Western prairies.
" <i>coesia</i> .		Prairies, many forms.
" <i>nemorialis</i> .	Wood Meadow Grass.	Cypress Hills.
" <i>Eatoni</i> .		" "
<i>Festuca ovina</i> .	Sheep's Fescue.	Sandy soil.
" <i>Thurberi</i> .	Thurber's Fescue.	Brandon and westward.
" <i>tenella</i> .	Small Fescue Grass.	Cypress Hills.
<i>Bromus ciliatus</i> .	Fringed Brome Grass.	Damp prairies and thickets.
" <i>Kalmii</i> .	Wild Chest.	Thicket and prairie.
" <i>brevi-aristatus</i> .		Cypress Hills.
<i>Phragmites communis</i> .	Common Reed Grass.	Bogs and Marshes.
<i>Lepturus paniculatus</i> .		Dry hillsides.
<i>Triticum repens</i> .	Couch Grass.	Salt marshes.
" <i>dasytachyum</i> .	Soft Wheat Grass.	Forest openings.
" <i>violaceum</i> .		Manitoba plain.
" <i>caninum</i> .		Thickets, river banks.
" <i>strigosum</i> .		Cypress Hills.
<i>Hordeum jubatum</i> .	Squirrel Tail Grass.	Salt marshes.
" <i>pratense</i> .		Salt marshes, rare.
<i>Elymus Canadensis</i> .	Canadian Lyme Grass.	River banks and thickets.
" <i>Sibiricus</i> .	Siberian Lyme Grass.	Cypress Hills.
" <i>mollis</i> .	Smooth Lyme Grass.	Lake Winnipegosis.
" <i>condensatus</i> .		Southern Plains.
" <i>striatus</i> .	Slender Hairy Lyme.	Thickets.
" <i>Virginicus</i> .	Lyme Grass.	Moist river bottoms.
" <i>dasytachyum</i> .	Soft Lyme Grass.	Mountain Woods.
" <i>parviflorum</i> .		Rich prairies.
<i>Danthonia spicata</i> .	Wild Oat Grass.	Forest openings.
" <i>intermedia</i> .	Prairie Oat Grass.	Rich prairies.
" <i>Californica</i> .	Californian Oat Grass.	Cypress Hills.
" <i>sericea</i> .	Silky Oat Grass.	Bow River.
<i>Aira cæspitosa</i> .	Hassock Grass.	River banks.
<i>Avena striata</i> .	Wood Oat Grass.	Thickets.
<i>Avena pratensis</i> .	Meadow Oat Grass.	Brandon and westward.

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BOTANICAL NAME.	COMMON NAME.	PLACE OF GROWTH.
<i>Trisetum subspicatum</i> .		Rocky Mountains.
<i>Hierochloa borealis</i> .	Seneca Grass.	Prairies, very common.
<i>Phalaris arundinacea</i> .	Reed Canary Grass.	Bogs and marshes.
<i>Beckmannia erucæformis</i> .	Beckmann's Grass.	Wet places, northward.
<i>Panicum virgatum</i> .	Tall Smooth Panic.	Sand Hills.
" <i>xanthophyllum</i> .		Thickets.
" <i>depauperatum</i> .		Manitoba prairies.
" <i>dichotomum</i> .		" "
" <i>pauciflorum</i> .		South-Western Manitoba.
<i>Andropogon furcatus</i> .	Finger Spiked Wood Grass.	River valleys northward.
" <i>scoparius</i> .	Purple Wood Grass.	Rich or sandy slopes.

Table II. *Cyperaceæ*.

BOTANICAL NAME.	COMMON NAME.	PLACE OF GROWTH.
<i>Cyperus Schweinitzii</i> .	Schweinitz's Gallinall.	Sand Hills.
<i>Eleocharis palustris</i> .	Common Spike Rush.	Marshes.
" <i>acicularis</i> .	Hair Club Rush.	Soft boggy ground.
" <i>tennuis</i> .	Slender Club Rush.	Shores of lakes.
<i>Scirpus cæspitosus</i>	Scaby stalked Club Rush.	Peat bogs, northward.
" <i>pauciflorus</i> .		Shores of lakes.
" <i>maritimus</i> .	Sea Bulrush.	Salt lakes.
" <i>pungens</i> .	Chair Bottom Rush.	Lake shores.
" <i>atrovirens</i> .		Stream valleys.
" <i>validus</i> .	Bulrush.	Bogs and marshes.
" <i>fluviatilis</i> .	River Rush.	Water marshes, north.
" <i>microcarpus</i> .	Wood Rush.	Streams and creeks
<i>Eriophorum alpinum</i> .	Cotton Grass.	Peat bogs, north.
" <i>vaginatum</i> .	Haretail.	" " "
" <i>polystachyon</i> .	Broad leaved Cotton Grass.	Grass marshes.
" <i>gracile</i> .	Narrow leaved Cotton Grass.	" "
<i>Carex adusta</i> .		Thickets.
" <i>aperta</i> .		Manitoba.
" <i>alpina</i> .	Alpine Sedge.	North woods.
" <i>aquatilis</i> .	Water Sedge.	Borders of marshes.
" <i>arctata</i> .	Short beaked Wood Sedge.	Woods, eastward.
" <i>arida</i> .	Dry Sedge.	Manitoba prairie.
" <i>aristata</i> .	Awned Sedge.	Common in marshes
" <i>aurea</i> .	Golden-fruited Sedge.	Boggy ground.
" <i>Backii</i> .	Back's Sedge.	Dry thickets.
" <i>canescens</i> .	White Carex.	Damp woods, north.
" <i>capillaris</i> .	Hair-like Sedge.	" " "
" <i>concinna</i> .		Dry woods.
" <i>Crawei</i> .	Crawe's Sedge.	Lake shores.
" <i>debilis</i> .	Weak Sedge.	Thickets.
" <i>cristata</i> .	Crested Sedge.	Prairies.
" <i>Deweyana</i> .	Dewey's Sedge.	Thickets and prairies.

BOTANICAL NAME.	COMMON NAME.	PLACE OF GROWTH.
<i>Carex disticha</i> .		Marshy meadows.
" <i>Douglasii</i> .	Douglas' Sedge.	Dry gravel hills.
" <i>eburnea</i> .	Bristle-leaved White Sedge.	River banks.
" <i>festiva</i> .		Rich damp slopes.
" <i>filifolia</i> .	Slender Sedge.	Dry gravel prairie.
" <i>filiformis</i> .	Slender-leaved Sedge.	Peat bogs.
" <i>fenea</i> .		Manitoba prairie.
" <i>granularis</i> .	Granular Spiked Sedge.	Boggy prairie.
" <i>gynocrates</i> .		Peat bogs, north.
" <i>Houghtonii</i> .	Houghton's Sedge.	Sandy woods.
" <i>irrigua</i> .	Spring Sedge.	Peat bogs.
" <i>lanuginosa</i> .	Woolly-fruited Sedge.	Damp prairies.
" <i>laxiflora</i> .	Loose-flowered Sedge.	Damp woods.
" <i>Liddoni</i> .	Liddon's Sedge.	Gravelly ridges.
" <i>limosa</i> .	Mud Sedge.	Peat bogs.
" <i>pulla</i> .		Bow River Valley.
" <i>livida</i> .	Livid Sedge.	Peat bogs.
" <i>longirostris</i> .	Long-beaked Sedge.	Thickets.
" <i>marceida</i> .		Open prairies.
" <i>monile</i> .		River margins.
" <i>Meadii</i> .	Mead's Sedge.	Damp prairie.
" <i>Novæ-Angliæ</i> .	New England Sedge.	Rocky woods.
" <i>Øderi</i> .	Øder's Sedge.	Lake margins.
" <i>oligosperma</i> .	Few-fruited Sedge.	Peat bogs.
" <i>obtusata</i> .		Dry prairies.
" <i>panicca</i> .		Damp prairies.
" <i>Parryana</i> .	Parry's Sedge.	" "
" <i>Pennsylvanica</i> .	Pennsylvania Sedge.	Dry thickets.
" <i>polytrichoides</i> .	Bristle Stalked Sedge.	Wet woods.
" <i>prairea</i> .	Prairie Sedge.	Marshy prairie.
" <i>retrorsa</i> .	Late-fruited Sedge.	Wet woods.
" <i>Richardsonii</i> .	Richardson's Sedge.	Dry thickets.
" <i>riparia</i> .	Lake Sedge.	Marshes.
" <i>scirpoidea</i> .		Damp prairies.
" <i>scoparia</i> .	Brown-spike Sedge.	Dry prairie.
" <i>siccata</i> .	Dry-spiked Sedge.	Dry sandy thickets.
" <i>stellulata</i> .	Little Prickley Sedge.	Wet woods and marshes.
" <i>stipata</i> .	Awl-fruited Sedge.	Wet woods.
" <i>straminea</i> .	Straw-colored Sedge.	Dry prairies.
" <i>stenophylla</i> .		Dry gravel ridges.
" <i>synchnocephala</i> .		Alluvial soil.
" <i>tenella</i> .	Two-seeded Sedge.	Wet woods.
" <i>tenuiflora</i> .	Slender cluster Spike Sedge.	" "
" <i>trisperma</i> .	Three-seeded Sedge.	" "
" <i>teretiuscula</i> .	Lesser-panicled Sedge.	Marshes.
" <i>Torreyi</i> .	Torrey's Sedge.	Wet prairies.
" <i>utriculata</i> .	Bladder-fruited Sedge.	Marshes.

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BOTANICAL NAME.	COMMON NAME.	PLACE OF GROWTH.
<i>Carex vaginata</i> .		Wet woods.
" <i>varia</i> .		Dry ravines.
" <i>vulgaris</i> .		Northern meadows.
" <i>vulpinoidea</i> .	Fox Sedge.	Eastern prairie.
" <i>Willdenovii</i> .	Willdenow's Sedge.	Lake of the Woods.
" <i>vesicaria</i> .		Bow River.
" <i>ampullacea</i> .		Ponds in the south.

Table III. List of Rushes.

BOTANICAL NAME.	COMMON NAME.	PLACE OF GROWTH.
<i>Luzula parviflora</i> .	Small-flowered Wood Rush.	Rocky Mountains.
<i>Juncus alpinus</i> .	Alpine Rush.	River margins.
" <i>Balticus</i> .	Baltic Rush.	Common on prairie.
" <i>bufonius</i> .	Toad Rush.	Muddy places.
" <i>Canadensis</i> .	Canadian Rush.	Low places.
" <i>filiformis</i> .	Slender Rush.	North woods.
" <i>longistylis</i> .	Long-styled Rush.	Moist ravines.
" <i>nodosus</i> .	Round-headed Rush.	Marshes and Springs.
" <i>tenuis</i> .	Slender Rush.	Open prairie.
" <i>xiphioides</i> .		Western prairie.
" <i>Vaseyi</i> .	Vasey's Rush.	Manitoba prairie.

Table IV. Leguminosæ. (Pea Family.)

BOTANICAL NAME.	COMMON NAME.	PLACE OF GROWTH.
<i>Lupinus argenteus</i> .	Silvery Lupino.	Cypress Hills.
" <i>Kingii</i> .	King's Lupine.	Sand Hills.
<i>Psoralea argophylla</i> .	Silvery Psoralea.	Prairies.
" <i>esculenta</i> .	Cree Potato.	Sandy Prairies.
" <i>lanceolata</i> .		Sand Hills.
<i>Petalostomum violaceus</i> .	Purple Prairie Clover.	Prairies.
" <i>candidus</i> .	White Prairie Clover.	Gravelly Soil.
<i>Amorpha canescens</i> .	Lead Plant.	Manitoba Prairie.
" <i>microphylla</i> .	Small-leaved Indigo Plant.	Assiniboine River.
<i>Astragalus caryocarpus</i> .	Ground Plum.	Prairies.
" <i>Canadensis</i> .		Woods and thickets.
" <i>hypoglottis</i> .		Damp prairies.
" <i>pectinatus</i> .		Dry prairies.
" <i>adsurgens</i> .		" "
" <i>aboriginum</i> .		Gravelly Hills.
" <i>triphyllus</i> .		Dry prairies.
" <i>paniculatus</i> .		Cypress Hills.
" <i>flexuosus</i> .		Prairies.
" <i>frigidus</i> .		Rocky Mountains.
" <i>microcystis</i> .		North Woods.
<i>Astragalus bisulcatus</i> .		Prairies.

Milk Vetches.

BOTANICAL NAME.	COMMON NAME.	PLACE OF GROWTH.
<i>Astragalus multiflorus</i> .		Prairies.
" <i>Drummondii</i> .		Dry Prairies.
" <i>racemosus</i> .	Milk Vetches.	" "
" <i>Missouriensis</i> .		Alkaline soil.
" <i>Kentrophyta</i> .		Dry sand.
<i>Oxytropis campestris</i> .		Rich prairies.
" <i>Lamberti</i> .		" "
" <i>deflexa</i> .		" "
" <i>splendens</i> .		Dry knolls.
" <i>podocarpa</i> .		Rocky Mountains.
<i>Glycyrrhiza lepidota</i> .	Wild Liquorice.	Rich soil.
<i>Hedysarum Mackenzii</i> .		Dry slopes.
" <i>boreale</i> .		Rich prairie.
<i>Vicia Americana</i> .	Wild Vetch.	Woods and thickets.
<i>Lathyrus venosus</i> .	Prairie Pea.	" "
" <i>ochroleucus</i> .		" "
" <i>palustris</i> .	Marsh Vetchling.	Wet meadows.
" <i>maritimus</i> .	Beach Pea.	Lake shores.
<i>Thermopsis rhombifolia</i> .	Wild Bean.	Rich prairies.
<i>Amphicarpæa monoica</i> .	Hog Pea Nut.	Thickets.

In Table I I have enumerated 96 species of true grasses found by myself growing wild in the North-West. These include many species which are of little value as pasture grasses on our prairies, yet in other lands are highly prized. Numerous species which on our prairies become tall enough to be cut for hay, in the drier country south of the boundary, seldom attain the height of a few inches.

Indians in past time burnt the grass over wide areas every fall, so that the young and tender grass of the burnt districts might tempt the buffalo to migrate. On the dry southern plain few of the grasses bear seed the year after a fire, as the surface of the ground being bare of any covering to act as a mulch, the warm sun begins to change the grass to hay before seed has been formed. Where the rainfall is greater this is not noticed and heavy crops of grass loaded with seed may be seen every year. Hence certain grasses obtain local names. A grass may be cut for hay in one locality, in another it may bear no seed and be merely short pasture. By burning the grass, good pasture for the

season is assured, but this should always be done in spring after the cattle have roamed over it all winter. Should the grass not be burned the young shoots grow up amongst the old grass, and cattle and horses wander off to where there is less of this mixture.

In Southern Manitoba many people speak against *Stipa spartea*, and call it "Wild Oat." Terrible stories are told of its effects on cattle, sheep, and horses, and even on men, but most of the tales are exaggerations or without one grain of truth. Further to the west, this grass, where the soil is dry and parched, scarcely ever produces more than five or six seeds in a season. Owing to the dryness of the climate it here has a tendency to form tufts, and is called "buffalo grass." This is the famous grass of the hills in the Bow River country, and forms the bulk of the winter pasture of the great plains. I speak from a thorough knowledge of both the grass and its distribution, and do not fear contradiction.

An illustration of the stories told about this grass may be of interest. In conversation with a gentleman last winter, he said, that no sheep could live a summer in Southern Manitoba owing to the "wild oat," and in proof he related the following anecdote: Many years ago the Hudson's Bay Company brought up a large number of sheep from St. Cloud, and pastured them on the plains. During the summer the sheep began to die, and an examination being made of two of them, their livers were found filled with the seeds and long awns of this grass. I asked him if any had been found in any other part of the sheep's body, and he said they had not. I asked him if he believed such nonsense and he at once answered, yes. I hinted that witches might have had a hand in the death of the sheep, as it was by filling the livers of their victims with pins and needles, in the good level old times, that they compassed their death. He became indignant and the conversation dropped. Sheep, horses,

and cattle fatten on these pastures. After a few years practical experience those myths will pass into oblivion.

The genus of grasses to which *Stipa spartea* belongs is represented on our plains by four species. All these species have remarkably awned seeds, and the one in question has one often seven inches long. It is not the awn, however, in this case, which does the mischief. The spikelets are one-flowered, and the seed always falls away at maturity. At the base of the seed is a callus (a hard and extremely sharp point) which will penetrate anything it is pushed against. This point is much smaller than the seed, and is no part of it.

All travellers on the plains in July are tormented with these seeds penetrating their moccasins, or entering their socks, or forming a fringe around their ankles, and even the *callus* getting into their shirts, but no ill effects other than the above are ever noticed. In the seven years I have travelled the plains, I never knew a horse to be injured by this grass, nor did I ever see a horse which did not prefer it to every other. Colonel Irvine, Commissioner of the North-West Mounted Police, told me when at Fort Walsh in 1880, that this grass, cut in a green state and dried for hay, was rather dangerous. While in charge of Wood Mountain a quantity of it had been cut for hay, and the horses got the seeds fastened in their mouths, so that after eating it their mouths had to be examined. After a time the horses began to eat it without injury to their mouths, and no other injurious results were observed.

This is the only grass against which an outcry has been raised, but in reality it is the one most highly spoken of, and deservedly so. It is the most plentiful and widely distributed grass on the plains, and is always found on soil which is comparatively dry. Owing to its preference for dry soils it is seldom tall enough for hay, and as its seeds ripen early and fall away amongst the grass, the ill effects if any arising from it will be short lived.

The grasses naturally fall into groups as regards their habitats, some preferring one place and some another. Those of the thickets, forest glades or prairies, stream valleys, coulées or ravines are hay grasses. Mixing with these in the vicinity of wood, are wild peas and vetches, and various species of Rosaceæ and Compositæ that make excellent hay. Approaching the marshy spots or growing in the water in June and July, are various Carices and other sedges, and amongst these in great quantities *Juncus Balticus*.

It will be seen that hay varies with the locality, and while one farmer may have a coarse poor hay his next neighbor may have a superior article. In that part of Manitoba northwest from Portage la Prairie the hay is very coarse, containing large quantities of Fresh Water Cord-Grass, mixed with Blue Joint and Foul Meadow. A western horse accustomed to a finer quality of hay will scarcely touch this, while the ponies of the neighborhood eat it with avidity. On the drier prairie this kind of hay is not seen, and all other varieties are abundant. Where there are many ponds much of the hay will be composed of various sedges and certain Poas and Calamagrostis. If the soil be rich and not too moist, the Carices disappear, and besides the above grasses species of *Danthonia*, *Bromus*, *Triticum*, *Elymus*, *Hierochloa* and *Vilfa*, with numerous Rosaceæ and Leguminosæ appear in great profusion. Should the hay be cut in a river valley it is almost wholly composed of *Carex aristata*, Foul Meadow, and Blue Joint. This is the hay of the mixed forest and prairie country. Men accustomed to see the finer kinds of cultivated hay would be apt to say that this coarse stuff could have very little fattening power, but I reply by stating that owing to the extraordinary richness of the soil all grasses are nutritive, but all are not alike palatable. Manitoba horses fatten on their hay. A horse brought from west of Fort Ellice would hardly live upon it. The one has been accustomed to a superior article as regards taste,

the other knows no difference. When I speak of Manitoba in this connection I mean that part which lies east of Pembina Mountain.

A late writer speaking of western or Manitoba hay makes the following practical remarks: "The first point a farmer would note about them is the abundance of the foliage of nearly all the species, while the grasses of Eastern Canada are nearly all culm or stem, having most of them only one, two, or three leaves; most of the North-Western grasses have ten or twenty leaves. Of course this is an extremely valuable feature in grass, as the leaves are more easily digested than the culms.

"The culms are exceedingly fine in the prairie grass, and this again would strike a farmer as indicating a good quality of grass, add to this that there are in some species such an abundance of seeds as to make the fodder partake of the nature of a feed of grain, and it will be seen that the tales about the readiness with which stock will fatten on prairie hay are not overdrawn."

The testimony of residents regarding the hay crop in the older settlements will be of interest, as these men speak from actual experience. The assertion that the native hay is superior to that made from cultivated species, should be taken as a doubtful one. It is not on account of the *species*, but on account of soil and climate, that the hay is so good. Why every fruit and succulent stem should be so sweet, I cannot say, but that they are so I know by experience. To the causes which produce this result we must ascribe the fat tening powers of the hay, and not to the species themselves.

Testimony of Settlers regarding Grasses and Hay. Only a few are given.

NAME.	POST OFFICE.	REMARKS.
B. Hartley.....	St. Charles.....	Hay plentiful almost equal to Timothy.
J. W. Adshhead.....	".....	I have hay in any quantity.

Jas.
A.

Geo.
Robt.
Rev.
Jno.

Jas.
W. E.
Jas.
A. M.
T. H.
A. C.
W. B.
W. A.
Jas. M.
Louis
Wm. J.
R. Bla.
Wm. C.
S. J. P.
Robt.

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GRASSES OF THE PLAINS, FORESTS, AND MOUNTAINS. 243

NAME	POST OFFICE.	REMARKS
Jas Sturton.....	Nelsonville.....	I have 20 acres which will yield 20 tons.
A. J. Moore.....	".....	I have plenty of good hay. Fifty hundred weight to the acre.
Geo. Tidsberry.....	High Bluff.....	Hay is plentiful. Very best quality.
Robt Adams.....	".....	There is plenty of hay on my farm.
Rev. Thomas Cook.....	Westbourne.....	There is any amount of good hay.
Jno. Smith.....	".....	I have abundance of hay of different kinds.
Jas. Fullerton.....	Cook's Creek.....	Best quality of ravine hay.
W. E. Mitchell.....	".....	Large quantities of hay. Quality good.
Jas Alrth.....	Stonewall.....	I have thousands of tons of the best hay.
A. McDonald.....	".....	I have plenty of good hay.
T. H. Brown.....	Poplar Point.....	There is abundance of hay. Quality good.
A. C. Harvey.....	Poplar Point.....	There is abundance of hay. Quality good.
W. B. Hall.....	Headingley.....	I can get any quantity of good hay.
W. A. Farmer.....	".....	There is more wild hay than we need.
Jas. Mathewson.....	Emerson.....	There is plenty of the best of hay.
Louis Dinsing.....	".....	Hay is plentiful, and very good.
Wm. A. Mann.....	Bird's Hill.....	Have more hay than I can cut.
R. Black.....	".....	I have hay of the best quality.
Wm. Corbett.....	Springfield.....	Hay is in abundance. Quality good.
S. J. Parsons.....	".....	Hay is in abundance. Quality good.
Robt. Bell.....	Burnside.....	We can get good hay close to us.

Another group prefers the sand hills and dry arid soils. These are highly spoken of in the United States, and constitute most of their pasture grasses.

Group of Sandhill Grasses.

Sporobolus cryptandrus.
Calamagrostis longifolia.
Festuca ovina.
Panicum virgatum.
Andropogon scoparius.
Koeleria cristata.

These are the inhabitants of the sands, though other species may be frequently seen in company with them. *Ericoma cuspidata* is a most lovely grass, growing in bunches on almost pure sand, and down in Arizona is considered a valuable pasture grass. The greater number of these grow in bunches and are hence called "bunch grass," but this is true of all species which grow on dry ground or where the rainfall is light, except they have running root stocks. Fes-

tuca, Andropogon, and Koeleria are all valuable grasses, and owing to their great production of leaves make excellent and continuous pasture.

It is the "Buffalo Grasses," however, that attract the attention of most people, and of these we may say a few words. The true Buffalo Grass is unknown on our prairies, but is common in Kansas and Colorado. Its name is *Buchloe dactyloides*. In habit it is quite different from any species we have, as it throws out runners, like those of the strawberry, which take root and so form new plants. Our buffalo grasses are two in number. One of which (*Bouteloua oligostachya*) I call the southern buffalo grass. The other (*Stipa spartea*) is the northern one. Of the latter I have spoken at some length, and shall now call attention to its distribution. This species is co-extensive with the prairies in the North-West and is most abundant on the "Buffalo Plains," the old winter haunts of the buffalo.

The former is our representative of the "*Grama grasses*" of the United States. These constitute the bulk of the pastures in the southwestern states. The latter is represented by numerous species of the same genus farther to the south, and are all considered excellent pasture grasses. It is noteworthy that within the limits of these two species the buffalo has had its home from time immemorial, and on our central plains the latter has its greatest development, and here in former times millions of buffalo found food in the winter.

Another valuable group which gives us many species, suited, both for pasture and hay, is found around salt ponds and in alkaline flats. Of this group the more prominent species are :—

- Spartina gracilis*.
- " *glabra*.
- Glyceria airoides*.
- " *distans*.
- " *tenuiflora*.

Brizopyrum spicatum.
Triticum repens (many forms).
Hordeum jubatum.
 " *pratense.*
Poa tenuifolia.

The most valuable of these are *Poa*, *Triticum*, and *Spartina*. These four grasses are valuable, and are greedily eaten by both horses and oxen wherever found. In my opinion no pastures are more valuable in summer than those of the salt marshes. Every summer when travelling on the plains our horses, when let out of harness, make straight for the salt marsh, if there is one in the neighborhood. At Morleyville in the Bow River country I noticed that wherever there was a patch of salt marsh plants these were cropped to the ground and tall grasses left standing. Many condemn the salt marshes as being sterile, but to my own knowledge they are preferred both by horses and cows to the pastures of the uplands. Almost all maritime countries have extensive marshes along their coasts, reclaimed from the sea, which are accounted valuable both for hay and pasture. In fact they are noted for their value. In our North-West we have narrow tracts which contain much saline or alkaline matter, and these are condemned as worthless by the same individuals who praise the others.

In early spring horses eat indiscriminately on the prairie. As the grasses harden they begin to show a preference and now repair to the salt marsh or the pond. Here they find *Triticum repens* (Quick or Quack grass), which is an invaluable grass on all clay and alkaline soils. Should the camp be pitched where this grass is abundant the horses begin to gain flesh at once, and three days will set them up. When this grass is old or not to be had horses repair to the round depressions in the prairie, where water stands nearly all summer, and crop the succulent tops of *Carex aristata* which produces very little seed, but abundance of stems and leaves. This species is preferred until the first severe frost, when

they abandon the marsh and take to the hill top. Their food now is the Buffalo grass, which during the month of August had passed from grass into well cured hay, with still a little green grass amongst it.

As hay it is equally as good as grass, and having produced next to no seed, the whole of the nutriment is laid up in the leaves. It is not true of our Buffalo grass that the seed is among the leaves as it is in Kansas. Owing to the annual fires, it matures little seed but a profusion of leaves, which contain all the nutriment of seeds. It is this ripening of the leaves by the great heat of August, and the light rainfall afterwards which does not rot the leaves, that cause our prairie pastures to be so fattening in winter. The winter pastures of the forest are quite different. In early summer and even often as late as July the ponds in the forest and the alluvial valleys of rivers are covered with water, which prevents rapid growth. The principal vegetation of these ponds and flats are Carices, Poas, and Blue Joint. These all produce many leaves, but scarcely any seed, and are quite green when the frost comes. This kills their upper leaves, but does not injure what is below, and in a few of these ponds or marshes a band of horses will find food for the whole winter. Should the snow be ever so deep the ponies will paw it away and get all the food they need but if a crust should come and not a pea vine or vetch to be had, they would necessarily succumb. A thaw in the North. West, that does not clear the ground of snow, is more to be dreaded than a temperature of 50° below zero.

In the enumeration of species at the beginning of this chapter I gave ninety-six as growing wild on the plains and in the woods. Of this number forty-four species are made into hay, and only one accounted injurious—*Brizopyrum spicatum*. The *Cyperaceæ* number eighty-five species, and of these not one is accounted injurious, though many are of little use for either pasture or hay. Still, of these I know

that forty-six species are either cut for hay or eaten as green pasture. All writers speak of the pea pine and vetch, and know the value of clover and the Leguminosæ generally, but few are prepared to hear that in Ontario we have only twenty-six species of this order, while in the North-West we have forty-two. So numerous are some species in individuals that they completely obscure the ground and prevent any other species from competing with them.

Another fodder plant, "Pasture Sage," of Nevada (*Artemisia frigida*), is worthy of mention. In many of the states, notably in Nevada and Utah, this species is almost wholly the winter pasture. After passing on to the treeless plains of the south this species becomes quite common, and in many localities is fully one-third of the vegetation. Not being recognized by our people as a forage plant, I mention it so that attention may be drawn to it as the best of winter pasture. It is this species that grows in such quantities at Ashcroft and other places in British Columbia, and always takes the place of bunch grass when the latter is destroyed by cattle. In general appearance it is extremely like wormwood, and I am sure that much of its value depends on the bitter principle it contains in common with all the *Artemisias*.

Another plant well worthy of mention is the White Sage (*Eurota lanata*), which is found abundantly on the tops of the dry hills on the southern plain. Dr. Rothrock in the botany of the 100th meridian says of this plant:—"White Sage is widely diffused throughout the Western territories, and held in high respect as a winter forage; stock feeding on it actually gaining flesh when living on this plant, so unpromising in its appearance. It is noteworthy that most animals do not eat it from choice."

I give the analysis of a few of the native western grasses taken from the Report of the United States Commissioner of Agriculture, in 1879. By placing the well known Timothy

(*Phleum pratensis*) at their head, Ontario farmers will know how near the wild grasses come to it in value as fodder.

	Flesh producing principles.	Fatty Matters.	Heat producing principles.	Woody Fibre and Ash.
<i>Phleum pratensis</i> . (Timothy.).....	11.36	3.55	53.35	31.74
<i>Andropogon scoparius</i>	16.21	1.59	33.72	50.48
<i>Poa pratensis</i> . (June Grass.).....	11.54	2.86	40.69	44.91
<i>Poa serotina</i> . (Foul Meadow.).....	8.91	3.48	42.44	45.17
<i>Panicum virgatum</i> . (Fall Panic Grass.).....	5.01	1.70	47.80	45.49
<i>Hierochloa borealis</i> . (Sweet scented Grass....	14.31	4.12	41.43	40.14
<i>Festuca ovina</i> . (Fescue Grass.).....	12.10	3.34	40.43	44.13

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CHAPTER XV.

Stock Raising.

Method of the Chapter—Cypress Hills—General Description, Altitude, Wood, Water, Grass—Value for Summer Pasture—Winter Pasture North of the Hills—Shelter in the *Coulées*—Plain North of the Hills—Its Description and Character—Bow River and Cypress Hills Compared—Summer Pasture Everywhere—Enumeration of Localities—All Equally Valuable—Ponies can Winter Anywhere—The Reason of This—Prairie Grass real Hay in Winter—Why Canadian Horses Die—How to Remedy This—Mr. Mackenzie's Opinion—Canadian Horses must be Fed—Cattle Succeed Well as they are always Grass Fed—Ponies use the Hoof; Cattle the Nose to Procure their Food in Winter—When Cattle must be Fed—Incidents on the Prairie in Winter—Mr. Selwyn's Testimony—Dr. Dawson's Testimony—Wild Cattle Winter out—Winter Shelter a Necessity—Other Locations as Good as Bow River—Country West of Cypress Hills—Hand Hills as They are Now—Description of the Hills—The "Store"—Country West of Sounding Lake—Tail Creek—Remains of Former Fights—Bow River Country—Natural Hay—Country Better Suited for Pasture than Farming—Description of the District—Root Crops easily Raised for Cattle Feed—Winter Storms Never do Harm if Food is Abundant—Sheep Raising—Keeping Hogs, easily Fattened—Animals easily Fattened in the North—Illustrations of this fact—Riga Exports Hides and Tallow—Our Plains of same Character as Russian Ones—Food Abundant Everywhere—An Irish Delegate's Views on Stock Raising—Mr. Spence's Opinions Regarding the same Matter—Testimony of Settlers Regarding Cold.

Stock raising being one of the principal occupations of future settlers in the southwestern part of the territories, I shall introduce the subject by describing the country in detail in that connection. No other place possesses so many advantages as the Cypress Hills, and these I will describe first.

CYPRESS HILLS.

The Cypress Hills may be described as a plateau, or a series of plateaux, extending about 100 miles from east to west. At the eastern end they rise abruptly from the plain to the height of 400 feet, but at the northwestern extremity they were found 2,000 feet above the plain north of Fort Walsh. At the "Head of the Mountain," the

western end of the hills, they are at least 1,500 feet higher than at the eastern end. By the readings of my aneroid they fall off from 1,500 to 2,000 feet in less than ten miles, by going north from any point of the western half of the hills. They are at most twenty-five miles wide at the eastern end, and beyond Fort Walsh they become so narrow that often the plateau is little over a mile in width. On the south, instead of abruptly falling off towards the plain, they gradually merge into it, so that it was only by sending a man fifteen miles to the south that I was sure we were on the southern edge of the hills, thirty miles east of Fort Walsh. The aneroid reading showed an elevation at their base of fifty feet more than the altitude of their eastern end.

The top of the hills may be characterized as a series of plateaux, gradually becoming more elevated as you proceed westward, and the *coulées* or narrow valleys separating these plateaux becoming correspondingly deeper. These latter are the sources of the streams which flow into the Saskatchewan on the one hand, and into the Missouri on the other. It was no uncommon occurrence to find water less than 100 yards apart in these *coulées* flowing in opposite directions.

Wood is abundant in all the *coulées*, which penetrate the hills on the east, north, and west sides, but only west of Fort Walsh that is it found inside the margin of the plateau itself. On the south, as far as my observation extended, wood is scarce, and it is only in the deeper recesses of the hills that any is to be seen. Along the eastern and northern slopes no wood was met with, except poplar of two species, small birch, and ash-leaved maple. On the southeast side, near East End Post, a few *coulées* were seen filled with fine groves of spruce, and amongst these the usual plants of the cedar-swamp were abundant. Twelve miles west of the eastern end we came on a deep

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coulée with many ramifying branches in which we found groves of spruce and poplar, and two fine creeks issuing from the western side of the valley, on each side of a marshy tract, less than 100 yards in extent, and flowing in opposite directions. Every few miles transverse valleys are seen sending their waters in both directions, and these constantly becoming deeper until the last one is reached at Fort Walsh, where the depression is 600 feet below the level of the plateau, and the stream heads to the north of the central or highest land and, therefore, drains the whole of the higher plateau. Cottonwood or Six Mile Coulée, farther east, and Medicine Coulée or Creek, the most northern tributary of the Missouri, do the same. Strong Current Creek drains the northeastern part, and the drainage of the northwestern is carried to the Saskatchewan by Maple Creek, a torrent which carries off the spring floods, but which was wholly without flowing water in August when we were on it. Twenty-five miles east of Fort Walsh spruce and pine (*Pinus contorta*) become prominent features, the latter always being found along the upper margin of the valley. West of Fort Walsh and near the "Head of the Mountain" this pine forms groves of many acres in extent, the trees ranging from four to twenty-four inches in diameter, those from six to twelve inches being the most abundant. This is the pine known in British Columbia as black or sugar pine, and is of little value for timber, although it is tall and straight.

Water, issuing from the hill sides in the form of brooks or springs, is very abundant and of the best quality, but ponds are scarcely ever met with on the plateau itself. Fish were seen in all the small brooks, but no trout were observed anywhere in the hills. Numerous bones of large fish were seen along the margin of a lake which extends many miles along the southern side of the hills, and which is the head of White Mud River, a tributary of the Milk River.

A careful examination of the flora causes me to conclude that the climate of the Cypress Hills is nowhere suited for the growth of cereals, except that of the eastern end for about twenty miles. The best soil was usually a black or reddish sandy loam, with a mixture of sand or quartzite gravel. Quartzite gravel is a very marked feature in the hills and on the plains extending south from them, and occurs very frequently both to the south and north of Fort Walsh, and also along the secondary slopes on the north side of the hills. All the land where it predominates is useless for agriculture, and makes poor pasture as regards quantity, but is of excellent quality. The southern plain extending from the hills as far as seen is very inferior in every sense, but being very much parched at this time (August 8th) may have appeared worse than it really is. This observation only applies to the tract having good soil, as those covered with gravel are useless.

The plateau west of Fort Walsh is almost a dead level, with generally a very fine soil, but so elevated and exposed to the cold winds from every quarter that the majority of the plants found there were identical with those of the Rocky Mountains, near Morleyville, over 4,000 feet above the sea.

The grasses and other forage plants of the hills were those peculiar to coolness and altitude, but were all highly nutritious, and almost identical with those found on the higher plateaux at Morleyville. In all the valleys and on the rich soils of the higher grounds the grass was tall enough for hay. No better summer pasture is to be found in all the wide North-West than exists on these hills, as the grass is always green, water of the best quality always abundant, and shelter from autumnal and winter storms always at hand. Wood in abundance for both house-building and fuel, and immense quantities of coal, near East End Post and on Medicine Coulee, at the western end, show that the future

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of the country in these respects is provided for. The only drawback is the fact that owing to the greenness of the grass when the frost occurs, it becomes useless for winter pasture, even if the snow were not too deep. No person intending to keep cattle should leave out of his calculations the necessity of procuring hay for the winter. In the past, buffalo constantly wintered between the Cypress Hills and the South Saskatchewan, but never on the hills themselves, and from this fact and my own observations while crossing that region, I am under the impression that cattle can winter out north of the hills without food being provided for them. There will be no difficulty as regards storms, as many ravines and coulées with high, exposed hills extend throughout the plains. No wood, however, can be obtained north of the base of the hills. The pasturage of this region is identical with that on Bow River, and the climate seems just as dry, and I was informed that it felt the influence of the winter chinooks to some extent likewise.

The great plain lying north of the Cypress Hills and south of the Saskatchewan and between the two "Elbows" of that river, has a breadth at its widest part of about 80 miles, and from east to west of 140 miles. West of the trail leading from Fort Walsh to Battleford the country is very broken, rising into high hills either separated by coulées, in which there are dry water-courses or regular stream valleys, which connect with the main valley that extends east and west. All the streams coming from the hills to the west send their waters to the Saskatchewan by Maple Creek, a stream at this season with a wide bed but containing very little water. The streams entering the eastern end of the valley collect together and flow north into Island Lake, through a valley about three miles wide, covered with cactus, artemisia and various saline plants. The soil of the hills and slopes west of the trail is excellent, but occasionally covered with quartzite gravel. That of the valleys is generally a whiteish clay

which becomes the stickiest of mud when wet. Although the soil is good, owing to the uneven surface, little of this land could be called agricultural. All the valleys were covered with good hay grass, but much of that on the hills was very short and stunted.

After crossing the Battleford trail and the cactus plain the character of the soil and country changed at once. The former now contained much sand, and at times passed into isolated patches of blown sand without any vegetation whatever upon them. In this sandy country water was very scarce, and one salt lake was met with where the water stank so that the horses would not drink it, although they had been nearly fourteen hours without any. This lake was over ten miles in length, and lay in a depression which connected at its northern end with Island Lake, and seemed to extend out to the base of the Cypress Hills at the south. Around the northern end we passed, and for about thirty miles travelled over a very dry region with scarcely any good water, and very little of any kind. The soil was unvarying sandy loam—never pure sand—with boulders often on the hill tops.

After a careful perusal of the above it will be seen that these hills offer advantages equal, if not superior, to those found in the Bow River country. Fine rich grass, pure spring water, elevation in the heat, and absence of flies are assured for summer. In the winter there are shelter from storms, and abundance of hay and fine pasture on the exposed hills, where the buffalo has wintered from time immemorial.

Every part of the North-West produces excellent pasture for summer, but only certain sections are suited for the wintering of stock wholly or partly without hay. In winter there must be a combination of advantages, and although in places where buffalo wintered in the past, cattle can do the same now, still shelter is necessary and this cannot be obtained without wood. The best pastures therefore are

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those near Turtle Mountain, Moose Mountain, Wood Mountain, the Cypress Hills, the valley of the South Saskatchewan and its tributaries, Tail Creek, and along the eastern base of the mountains for forty miles north of Bow River. Without entering into details regarding these localities, I may state that, as I have shown when speaking of the grasses, all have nearly the same species and consequently are equally valuable as pasture.

Ponies can winter out without difficulty on any part of the prairie, or mixed forest and prairie, between Winnipeg and the Rocky Mountains. These animals use their feet and scrape away the snow even if it be two feet deep, and get all the food they require. The heats of August and the light rainfall of the autumn, taken in connection with the small amount of snow, which seldom thaws but evaporates under the action of the wintry sun even at a temperature below zero, produce every season, an immense amount of fodder equal to hay, over an area not less than 300,000 square miles in extent. It is the light rainfall of the autumn and the setting in of winter without it, which gives the nutritious hay-grass that cattle and horses eat on the plains all winter. This is the reason that accounts for these animals coming in fat from the plains in spring. Cattle, fed when the snow gets a crust on it in March, would winter just as well as horses. All that has been said and written about the nutritious grasses of the North-West resolves itself into this—the frosts and suns of October dry the grass; while the November snows cover it to a depth of a few inches, and so it remains till spring, if not eaten in the meantime.

In summer ponies eat great quantities of grass, and never having tasted oats do not look for such luxuries. Canadian horses, on the other hand, when turned out of harness eat the grass for a short time and then return to camp for oats. Should they get none they hang around the camp, and are often put in harness still hungry. A very few weeks settle

the question. They either take to the grass or they die, like many others, from over work with insufficient food. In the winter they cannot get their food as they never use their feet to paw away the snow. Put them on native hay, and you are met by the same difficulty as in summer,—they will not eat enough. Farmers know that horses fed on grass have necessarily a large paunch, while those fed on hay and oats have a small one, hence the majority of Canadian horses die in a year or two if they are not properly fed. It is not the climate that kills Canadian horses but insufficient food.

Mr. Kenneth Mackenzie, who has been in the country for over ten years, says "that twenty per cent. of the horses die or are useless the two first years after being in Manitoba," and advises they should not be brought thither until more timothy and oats are raised in the country. This advice was given six years ago, but its force remains the same, as imported stock must be fed. Ponies can live anywhere in the north, and so can Canadian horses as regards climate, but the latter must get oats if they are expected to live and thrive.

Cattle, whether native or imported, as long as they are grass raised ones, will succeed well in the country in any part, and not be injured by climate nor by the food obtained by themselves. As cattle use the nose instead of the hoof to clear away the snow, they cannot support themselves when the snow gets too deep or covered with a crust, as it sometimes does in the Saskatchewan country. It then becomes imperative to lay up at least a partial supply of hay in most if not all sections of the country, to protect the cattle from either of the above contingencies. I wish to be clearly understood on this point, and therefore repeat that cold does not cause the death of either horses or cattle, but all deaths arise from either being over worked or under fed, or both.

While on the plains, in the winter of 1875, we were caught in a severe snowstorm, and many of our horses gave out, and one died. One night when the thermometer sank below zero a mare dropped a colt, and the next morning I drove it and its mother into camp. The mare was harnessed in the cart and the colt put inside, and we travelled on. Three days afterwards we left both at Rat Creek alive and well.

In 1874 A. R. C. Selwyn, F.R.S., Director of the Geological Survey, examined the country, and in his report of the following year wrote of the Saskatchewan district:—"At present there are comparatively few cattle in the country and it is customary to house and feed them on hay during the winter, the prevailing opinion being that they cannot otherwise survive. There is, however, every reason to believe that this is a mistake, and that if a hardy race of cattle suitable to the climate were introduced, they would speedily become acclimated, and not only be able to survive, but would thrive through the winter without the aid of artificial feeding and shelter; and if so, vast herds might soon be reared on these rich and boundless pastures, reanimating the now deserted feeding grounds of the buffalo, and becoming a source of large profit to the settler, as well as affording a ready and cheap means of providing for the Indians, who are now frequently reduced to the verge of starvation, owing to the annually increasing scarcity of buffalo, upon which they are at present entirely dependent. I took some trouble to inquire into this subject, and though I found the prevalent belief to be as I have stated, yet I was informed of several instances of cattle having been lost in the fall, and in every case they had not only survived but had been recovered in excellent condition in the following spring." Dr. George M. Dawson, in his Report of 1874, says:—"In July of last summer I saw a band of cattle in the vicinity of the Line, south of Wood Mountain, which

had strayed from one of the United State's forts to the south. They were quite wild, and almost as difficult to approach as the buffalo; and notwithstanding the fact that they had originally come from Texas, and were unaccustomed to frost and snow, they had passed through the winter, and were in capital condition."

All the requirements for stock-raising are found wherever there is a sufficiency of shelter in the winter, as all the prairie affords good pasture in the summer. Winter pasture is surest wherever there are high rolling or sharp hills, but the snowfall is generally so light that cattle and horses can pasture almost anywhere south of lat. 52° west of the 106th meridian. Although all eyes are turned at present to the Bow River country, there are just as fine locations in other parts of the territory. I have described the Cypress Hills, cited Wood Mountain and other points, and will now give a general review of the more salient points in connection with the other portions of the region in question.

Westward of the Cypress Hills and extending towards Fort Macleod, the country is very much cut up with coulées (ravines) and gravel hills with intervening spaces of rich pasture land, which by reason of wood being very scarce is not a desirable country in winter. Northwest from the hills the Saskatchewan divides into the Red Deer, Bow, and Belly Rivers. The valleys of these streams being from 200 to 500 feet in depth, with abundance of brush and groves of trees with many branching coulées opening into them, will give shelter to many thousand head of cattle during the severest storms of winter, while in mild weather they can find abundance of pasture on the hills outside the river valleys.

The Hand Hills district on the Red Deer River southwest from Battleford, in former years was noted for its rich pastures and for the enormous herds of buffalo wintering in its neighborhood. At present the buffalo are all gone, the Indians have disappeared with them, the whole region is with-

out inhabitant, and nothing is left but the waving grass on the hillsides and the water fowl in the marshy flats. This region is thus described by Captain Palliser twenty-five years ago, when the land was eaten bare by vast herds of buffalo:—"The plain all around the base of these hills is bare and arid, but the high level of the hills bears a very fair and almost rich pasture, being 680 feet higher than the plain, and 3,400 feet above the sea; it also contains lakes of pure fresh water, and gullies with small groves of poplar."

While exploring the hills in 1879 I was much impressed with the value of this region as a fine country for stock of all kinds. It may be described as a land of brooks, small lakes and ponds, grass marshes, and rich bottoms lying between rolling or sharp, rounded hills, which are covered with nutritive grass in summer, and in winter with the same grass but now converted into excellent hay. Standing on a hill-top and looking over a wide area of grass-covered hills and valleys which stretched out to the horizon on every hand, and which could be extended almost indefinitely in any direction, is it too much to say that here was room for millions of cattle to roam at will and get fat on the very richest grass? No man looking over such a country could doubt its value, for were the grass of the hills to become too dry the succulent pasture along the lake or pond was close at hand, and if that of the salt marsh was preferred it was there also. On the south side of the hills and about 400 feet above the plain is a fine spring of clear crystal water about twenty yards across. This was the favorite camping ground of the Crees, and between it and Red Deer River extended a plain, broken into low hills with intervening ponds and meadows. In the Cree language this plain was called the "Store," as buffalo in the palmy days of the past were never wanting from it. In those days he would walk out of his tent and look over the plain to where the herds were grazing, mount his pony, go out and shoot a fat cow, and return

with his meat to camp. It requires no stretch of imagination to see all this a reality again, but instead of the Indian and buffalo it will be the white man and his flocks and herds.

Lying west from Sounding Lake and the Hand Hills a magnificent pastoral country extends to and beyond Tail Creek, the outlet of Buffalo Lake. Timber in groves is found north of lat. 52°, and the whole region is unequalled for its pasturage, water, and its shelter. For many years Tail Creek was a favorite wintering ground for the Half-breeds when the buffalo roamed in countless thousands around them, but with the disappearance of the latter the former also passed away. Their houses in many cases have been burned down, and nothing is left but the mud chimney to tell the story of man's occupation. On many parts of the exposed plain the stone circles indicate where the tepees of the Indians have stood, and often the larger circle will show where the chief's tent was pitched, with his warriors close to him. One day, in 1879, we came upon the remains of a former camp, indicated by the stone circles, and here were the ghastly sights of a past massacre or battle, skulls and jaw bones being nearly perfect, all the other bones having either disappeared altogether or been much gnawed by wolves or dogs.

The Bow River country is only a part of a great whole that extends from the Boundary northward for 200 miles, and eastward from the base of the Rockies for at least 150 miles. In altitude this region is from 3,000 to 4,000 feet above the sea, and principally consists of rolling hills and rich valleys or river bottoms. The soil of these valleys is generally very rich and much natural hay grows luxuriantly in the bottoms and along the sides, while the upper slopes when not covered with wood are very often strewn over with shingle (quartzite drift) to the depth of a few inches or many feet. Although grain can be and is raised

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in many localities in this area, and the soil is exceptionally good, yet, owing to its general altitude and proximity to the mountains, it cannot be highly recommended as a farming country. I know that many parties will be found to contradict the above statement and aver that it is generally an excellent farming country, and Morleyville will be cited as an instance, but I can say I have seen Morleyville and the vicinity, and while I bear testimony to its value from an agricultural standpoint, I still affirm that its natural advantages make it more of a pastoral country.

Leaving out the climate, which is spoken of in another chapter, we may describe this country as a region of clear mountain streams, spring brooks, and large rivers flowing over beds of sand or gravel and literally filled with the finest trout. As the larger streams debouch on the plain they lose their limpid character and become milky from the wearing away of the clays along their banks. When the water begins to change, trout become scarce and soon disappear, but now pike (jack-fish) and gold eyes take their place. In the valleys and along the streams natural hay can be procured in abundance, while the drier uplands will be covered all summer long with rich green grass, owing to the frequent showers and heavy dews. Where the timber has been lately burnt off pea-vine and vetch, with other tall growing plants, grow so thick that it is extremely difficult to walk through them, and cattle, either in summer or winter, find abundant and agreeable food. Owing to the warm winds which frequently prevail in winter, little hay is needed, but if it were, enough could be procured with very little effort.

All farmers, in every section of the country, say that perhaps in no other part of the American continent do root crops come to such excellence as they do in the North-West. Turnips and carrots grow to a fabulous size, and potatoes surpass anything ever seen by an Irishman in his own coun-

try. The rich river bottoms are just the places to raise these, and every ranche (cattle farm) will eventually have its thousands of bushels of roots raised at a nominal cost to supplement the hay or grass of the hill pastures.

Although I have mentioned many points as being well-suited for stock farming on a large scale, it does not follow that these are the only locations. Wherever settlements are formed in the future there will always be abundance of stock, as farmers soon learn that cattle and their products are a source of constant income in any country. Experience has taught farmers already that severe cold never injures their stock if they are regularly supplied with food when they cannot obtain it themselves. Intense cold is generally accompanied with clear skies and little wind, and neither horses nor cattle seem to care for it. Sleety storms, such as often take place in Ontario are unknown, and during the winter cattle are seldom if ever wet. Extreme cold is never accompanied with chilliness in the west, and as nature provides a thicker and therefore a warmer coat, no fears need be entertained of stock suffering from this cause. Insufficient food—and this alone—causes the death of horses and cattle throughout the west. A mild winter and deep snow cause many deaths, while a severe winter and light snowfall have scarcely any death record. It is after a winter of this kind that the "animals come out fat" in the spring.

Many believe that sheep-raising will not pay owing to the "wild oat" (*Stipa spartea*), but that idea has been exploded within the last few years. The objection may have some force in it, but I confess that I am sceptical on the point. A late writer says that lambs are dropped too soon, and owing to the length of the winter this cannot be prevented. Winter certainly does not set in earlier than November and it ends as early as it does in Ontario, yet I have never heard such a complaint made in Ontario, except

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by a shiftless person. Residents know that in March and April hardly any rain or snow falls in the North-West, and I fail to see where the injurious effects of the weather comes in.

Barley and peas are the usual food for hogs, and Mr. Yeomans, of Burnside, told me he found no difficulty in fattening them, nor in keeping them over. His Berkshires were as fine in the last of October as they would be in Ontario at the same time.

Naturalists are well aware that animals put on more fat in cold countries than they do in warm ones. In fact to be fat is the normal condition of all northern animals when in health. With this fact before us let us consider why there should be any doubt of the fattening power of the northern grasses. On other occasions I have proved that climate, besides thickening the coat, actually fattened the animal, and this has been borne out by the importation of Texas cattle into Montana. These cattle actually become fatter on the Montana plains in winter than on their own native plains in summer. Grass-fattened cattle in the north make just as fine beef as the stall fed ones of the south; and the exports of Riga show that Russia for many years has derived a large income from the export of her hides and tallow, the grass fed products of her interior plains. It is surely time that the cloud which has hung so long over our great interior plains should be lifted, and the world at large know of their great value as food producers. Let a man settle where he may, between Winnipeg on the east and the Rocky Mountains on the west, and the International Boundary on the south and the parallel of 60° north, and he will find no difficulty in procuring food. Should the soil give no returns the lakes and rivers teem with fish, and every marsh and pool swarms with water fowl. If he prefers the south he can raise fat cattle without an hour's labor, and if he tries the middle region a prolific soil will more than supply his wants. Here

on an area of 350,000 square miles is everything to supply a vast population, and all that is needed is a mere scratching of the soil or the placing of a net in the water to supply a household with food. Want, either present or future, is not to be feared, and man living in a healthy and soul invigorating atmosphere will attain his highest development, and a nation will yet arise on these plains that will have no superior on the American continent.

In conclusion I will add a few extracts from reports of gentlemen of experience who travelled extensively in the country a few years since. The following extract is taken from the report of Mr. R. H. B. P. Anderson, of Listowel, County Kerry, Ireland:—

“Cattle, sheep, and horses thrive well, and in spite of the long winter during which they must be housed. Stock-raising is found very profitable, hay can be had in abundance, and cattle keep their condition well on it. I see no reason why they could not be shipped to England from Manitoba when the Canadian Pacific Railway is finished. At present there are not many well-bred cattle or sheep in the country, but the number is increasing rapidly year by year. I made searching inquiries regarding the danger of spear-grass (*Stipa spartea*) to sheep, and found it was very much exaggerated; it is only to the careless or lazy farmer it presents any difficulty; it is by no means common, and in the districts where it grows it can be rendered harmless by eating it down early, or by running a mowing machine over the patches of ground covered by it. I heard some complaints about the difficulty of keeping horses in Manitoba. In my opinion, and I judge by what I saw, it would be entirely obviated by supplying plenty of good hay and oats. Horses cannot live on the prairie grass. Mules are extremely good, some of them magnificent brutes, standing seventeen hands high; they seemed to grow fat on the grass, and are altogether hardier and more adapted to the country in its present state (till

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more timothy and oats are grown) than the horse, but they are much dearer. Oxen, however, are the mainstay of the farmer in cultivating his farm, in fact, in breaking the prairie he could scarcely do without them, they are powerful brutes, and for oxen are wonderfully active; they cost nothing for keep, and also have the advantage of being cheaper than either horses or mules. An ox costs about £14, a horse about £25, and a mule about £35. Good milch cows can be had for about £8, sheep 12s. to 18s. each. I forgot to say that the pig seems to be at home here as everywhere else. I saw some prize Berkshires eighty miles from Winnipeg, that had been brought from Ontario, and seemed happy in their new quarters. The ordinary diseases to which stock are liable in Ireland are unknown in any part of Canada, nor is there any, that I have heard of, peculiar to the country."

Mr. Thomas Spence, Clerk in the Legislative Assembly of Manitoba, in an article published last year says while speaking of stock-raising:—"The experience of many years shows that no physical impediment arising from climate or soil exists to prevent the prairies of our North-West becoming one of the best grazing countries in the world, and with the introduction of immigration, in a few years, the beautiful prairies of the North-West will be enlivened by numerous flocks and herds, and the cattle trade already springing into importance will rapidly increase, or, without much difficulty, be diverted into a southern channel. For raising cattle and horses this country is equal to the State of Illinois, and for sheep-raising it is far superior. The quality of the beef and mutton raised upon our northern grasses has been pronounced of superior excellence. Among the peculiar advantages of Manitoba for stock-raising and wool growing, the most prominent are:—1st. The richness and luxuriance of the native grasses. The grass is mainly cut on the swamps and meadows, which chequer the prairies or

fringe the streams and lakes; 2nd. The great extent of unoccupied land, affording for many years to come a wide range of free pasturage; 3rd. The remarkable dryness and healthfulness of the winter. The cold dry air sharpens the appetite and promotes a rapid secretion of fat and a vigorous muscular development. All these point to stock-raising as one of the most important and promising of the diversified channels into which the industry of the immigrant and capitalist is to be directed. Notwithstanding the expensiveness and difficulty of stocking farms in a new country like this, where animals must be procured at a distance of hundreds of miles, the progress already made in this direction affords a gratifying proof of the rapid growth of this important interest.

SHEEP AND WOOL GROWING.

There is not room in this guide to give the subject of wool-growing the attention which its importance deserves. The experience of forty years, and of some who have been engaged in the business in Australia, established beyond a reasonable doubt the following conclusions:—1. That from the nature of our climate and the general undulating character of the prairies, the richness of the grasses, and the purity of the waters, this country is adapted in an eminent degree to the healthful and profitable breeding of sheep; 2. That sheep are entirely free from the diseases which cut them off so largely in more southern climates; 3. That the characteristic dryness of our winters, not only protect them from the casualties to which they are exposed in moister winter climates, but stimulates them to a more healthy and vigorous growth; 4. That the naturalization of sheep imported from Illinois, Ohio, and other middle States of America, *improves the quality of their wool*; 5. That it is by *far the most profitable branch of industry in which the settler with capital can engage*, especially in connection with stock-raising. The average product of wool is not subject to fluctuation.

and the price also is far steadier than that of breadstuffs. Well-fed ewes produce fleeces from three to three and a half pounds. Wethers produce fleeces from six to eight pounds, the wool being of a good quality. All breeds stand the winter cold well, but the Cotswold the best. An instance came to the knowledge of the writer where a flock of about twenty strayed away in the beginning of winter, and were found in the spring fat, and none missing, but an addition to the flock in lambs. An experienced settler writes as follows:—I believe this to be equal to any country for sheep growing. I prefer the Cotswold breed to any other for this country, as they are good shearers, prolific breeders, and good for mutton. My sheep have been troubled with no disease, but the dogs have killed and wounded some. I believe that in this branch of husbandry this country has few equals, and no superiors in any country on the globe."

Having shown the great natural advantages of the North-West as a stock-raising district, it may be asked how all those cattle are to reach a market. To many of the ranchmen along the base of the mountains this question will soon be of paramount importance. In two years the Canadian Pacific Railway will reach the base of the Rocky Mountains, and the surplus cattle will begin to come eastward.

For many years cattle shippers have felt that a great wrong was done by the promiscuous shipping of cattle in badly constructed cars. Inventors set to work and numbers of cars were constructed, but none seemed to meet the approval of both railway men and shippers, as they were generally far too expensive. The large amount of capital invested in the business, from \$25,000,000 to \$30,000,000 annually, and the great yearly loss by death and disease from torture and abuse, caused by the ordinary mode of transmission, not taking into consideration the amount of unhealthy meat consumed, stimulated those who fully realized the importance of the matter to provide a remedy. This has been

found in the "Hunter Cattle Car," which now carries cattle from Chicago to Boston, Halifax, and other Eastern ports with a great saving of shrinkage in weight and of time, as owing to its peculiar construction the cattle can lie down or stand up at will. The Grand Trunk authorities are so well satisfied of its merits, that they are fitting up a number of these cars to test their practicability, and it is believed that this style of car will soon come into general use. Should this be so our stock-raisers need have no fear for the success of their business, as they are assured of at least ten per cent. increase on the value of their stock. Shippers can calculate to a certainty on their probable loss, and hence will be able to give better prices. From a humanitarian aspect this improvement in the transportation of cattle must be greatly appreciated.

Testimony of Settlers regarding the effect of Cold on Cattle.

Benjamin Hartley	St. Charles	Animals do not suffer so much here as in England.
A. Gillespie	Greenwood	Animals do well here in winter.
S. C. Higginson	Oakland	The winters are dry; animals do not suffer from cold.
James Sturton	Nelsonville	Climate being drier, animals stand cold better than in Ontario.
S. Ballantyne	West Lynne	Although last winter was very cold stock wintered well.
John Begg	Morris	I have known young cattle to winter at the straw pile.
Thomas Sigson	Portage la Prairie ..	The winters being dry and frosty are favorable to cattle.
Thomas Dalzell	High Bluff	The winter is not hard on cattle here.
John Frazer	Kildonan	The winter though cold is uniform.
W. A. Farmer	Headingly	The winter is not severe on animals, they are very healthy.
W. A. Mann	Bird's Hill	Cattle do better here in a cold steady winter than in a mild one.
M. Owens	High Bluff	The winters here are less severe on cattle than in Ontario.
Nelson Brown	High Bluff	The winters here have the same effect on animals as in Ontario.
H. C. Graham	Stonewall	The dryness of the atmosphere neutralizes the cold.
Matthew Ferris	Burnside	The winter not much severer here than in Ontario.

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CHAPTER XVI.

Stock Raising in the Bow River District compared with Montana.

[THIS CHAPTER WAS WRITTEN BY ALEX. BEGG, ESQ.]

American Writers Ignore our North-West, or Speak of its Sterility—Bow River District Defined—Montana Stock-raisers Testify to the Superiority of the Bow River District—Description of North-Western Montana—It Improves as We Go North—Cattle now in the Bow River Country—No Loss from Winter Storms—Renting Grazing Lands—Statistics of Stock in Montana—Chinook Wind—Description of the Rocky Mountains—How to Stock a Rancho—Sort of Cattle to Choose—Comparison of Varieties of Stock—Capital Necessary to Establish a Rancho—Size of a Rancho—The Rate of Increase—Profits on the Investment—Will There be a Market?—Another Estimate of Cost and Profit—Is it Wise to Lay in Some Hay—Sort of Men for Herdsmen—Men and Cattle Should be Comfortable—The C. P. R. to cross the Bow River District—Sheep-farming as a Future Business—Every Requirement in the Region in Question—A Perfect Sheep's Paradise—No Sheep Ever Lost by Severe Weather in Montana—Little Disease among Sheep—Profit from Sheep Farming in Colorado—Equally as Good in Bow River Country—Breeding and Rearing Horses—Conclusion.

IN a United States work on Stock-raising, published in 1881, the author says:—"There are but five great national grazing grounds in the whole world, viz., in Central Asia, South Africa, South America, and the Plains of North America. The first is larger in extent than all Europe, the second is as great, the third half as much, the fourth is as large as South America, and the fifth the boundless Plains of the United States, containing 1,650,000 square miles, with over a billion of acres."

The writer referred to does not include in his estimate the vast provinces of British North America, with the fertile slopes and sheltered foot hills east of the Rocky Mountains, embracing a larger, richer, and more valuable area of grazing lands than those of the neighboring territories to the south. The whole of the northern country is ignored; as speaking of Montana, he says, "it has for its boundary on the north the bleak and almost limitless British possessions." True, they are almost limitless, but not so bleak as the greater

part of Montana, which he represents as the best grazing district of the United States.

The best pasturage lands belonging to the Dominion of Canada, are, as far as yet ascertained, to be found in what is generally known as the Bow River District. It lies east of the Rocky Mountains, commencing at the base of "The Rockies," near where the 114th degree of longitude, west of Greenwich, or the fifth principal meridian of the North-West surveys, intersects the international boundary line, which conventionally separates the district from Montana territory.

Those grazing lands extend, in more or less perfection, eastward along the boundary line for over a hundred miles, as far as the Cypress Hills, and northwards parallel to the Rocky Mountain range, across the head waters and along the valleys of the North Saskatchewan, Athabasca, Peace, and the Mackenzie Rivers. This vast region, especially along Peace River, although not fully explored, is on account of isothermal lines, reported to be milder than Montana in winter, less subject to summer frost, as rich as the lands on the head waters of the South Saskatchewan and Bow River, if not richer, and well adapted for stock-raising and farming.

As a stock-raising country the Bow River district is the best in America. I say this advisedly, as I journeyed through a large portion of Montana and through the Bow River district, as far north as Edmonton (about 500 miles north of Fort Benton), in August, September, and October, 1881, and closely observed the capabilities of each section along the route. Cattle owners from Montana and Texas, who have resided in the Bow River district for the past six or eight years, and raised stock west of Fort McLeod and north towards Calgary, testified freely to the superior grazing properties of the country; whilst the excellent condition of the cattle which had all wintered out in the severe winter of 1880-1, was ocular demonstration of the truth of their statements.

STOCK RAISING IN THE BOW RIVER DISTRICT.

Bordering on the Missouri River as far as Fort Benton, which is more than half way west through Montana, the country is almost destitute of running streams. The grass, when I passed through in August, was stunted, crisp, and dried up. The soil is chiefly a close, retentive adobé clay, which becomes exceedingly soft when wet, but when dry bakes like brick. The consequence is that on many of the upper plateaux during fall and spring small pools are formed, which dry up in early summer, leaving the surface almost bare of vegetation. Cactus and sage brush abound. Hundreds of thousands of acres of what is denominated "bad lands" are bare, and large tracts of the "better lands" are only about one-quarter covered with grass.

From Fort Benton northward, nearly to the boundary line, there is not much improvement in the general pasturage qualities of the country, except along the narrow valleys of the Teton and Marias rivers, where there are some small ranches.

Near the international boundary line there is a perceptible change for the better, more especially after leaving the "alkali flats" and reaching the plateau above the "rocky springs," which extends to and beyond Milk River.

Farther north and westerly the land improves, and nearer the foot hills of the Rocky Mountains the whole country is better watered, and is more moist. The grass is more closely rooted and greener all the year round.

Stock-raising in this region is only in its infancy. Up to April, 1881, the number of cattle in the Bow River district only amounted to about 3,000; since then, up to spring 1882, they have increased by importation and the formation of new ranches to nearly 15,000. By the spring 1883, it is expected the numbers will reach 75,000. 300 breeding mares were imported by "The Cochrane Ranch Co." in 1881.

This progress is considered satisfactory. The cattle have so far wintered out remarkably well. None were lost through severe weather during the winter 1880-1 in the Bow River district, although many perished in Montana and farther south. Reports for 1881-2 are favorable—not much snow, and stock in excellent condition.

Provision is now made by the Dominion Government to lease sections of grazing lands as ranches for a term of twenty-one years, at the very moderate rent of one cent per acre. Ten acres are allowed to each head of cattle, to be placed on the ground leased within three years of the granting of the lease. A large number of applications have been made for ranches, and as stock of all kinds for breeding purposes are admitted free of duty, the increase during the next few years will be very large.

In Montana the business of stock-raising has increased to a large extent, and has been profitable to those engaged in the trade. A return by the assessors of the territory gave the following as the number and the value of live stock in Montana in the year 1877, viz.:—

	NUMBER.		VALUE.
Cattle.....	160,647	....	\$1,812,920
Horses	26,496	....	851,674
Mules.....	1,688	....	105,646
Sheep	51,558	....	148,894
Hogs.....	4,642	....	20,593
	<hr/>		<hr/>
	245,031		\$2,939,734

Since then the stock there has been doubled. There is nothing to hinder equal progress in the Canadian North-West. The natural features of the country are most favorable. Nutritious grasses in the greatest abundance, up to the base of the snow-capped "Rockies," penetrate gorges which frequently open into valleys walled in by perpendicular cliffs, or grow in lovely glades amongst evergreen spruce and other trees which clothe their lofty sides. Sheltered *coulées* and ravines leading from the bottom lands or valleys

of creeks and rivers, to the higher levels of the prairie, afford ample protection from storms when they occur. "Chinook winds" from the Pacific coast rush through the Kootanie, Crow's Nest, Bow River, and numerous other passes, along the head waters of hundreds of crystal streams and around the ends of longitudinal ridges, which divide the mountain ranges, forming channels or conductors for those warm winds to increase the temperature and dissolve the snow as if by magic.

From Chief Mountain, which rises like a huge pyramid near the international boundary, the serrated crest line of the "Rockies" continues in picturesque and Alpine grandeur to Mount Hooker, which is 15,500 feet high, where the head waters of the North Saskatchewan have their rise, and some distance farther north, at Mount Brown, 15,990 feet high, is the feeder of the river Athabasca. Beyond this point the crest gradually declines in level to the Arctic ocean. In lat. 62° its height is estimated at between 3,000 and 4,000 feet. Northward of lat. 55° the main eastern range ceases to be the water shed of the drainage of the country between Hudson's Bay, the Arctic, and the Pacific. Peace and Mackenzie rivers cleave this great chain and have their sources in ranges farther west. This seems to account for the geniality of the climate in the neighborhood of those rivers, although so far north.

In reference to the best way of proceeding to stock a ranch in the North-West, I cannot do better than quote from a lecture delivered by Professor W. Brown, of the Ontario Agricultural College, Guelph, before the Farmers' Club at Markham, Ontario, 6th December, 1881. Mr. Brown had given considerable attention to the subject, as parties had been in correspondence with him as to the character and standing of the entirely new line of cattle grazing opening in the North-West territory. After preliminary remarks he said:—"I would recommend the agreement of three

young practical stockmen, in possession, let us say, of \$5,000 each, making a joint purse of \$15,000. Having chosen by actual inspection the particular district, in view of (1) future railway communication, (2) shelter, (3) water supply, (4) rich, enduring grasses, (5) the necessity, ultimately, of fencing cheaply by utilizing any natural advantages, such as rivers, (6) the very model of a choice home cattle station, and (7) the easy extension of the ranch, should everything smile—we should then consider a suitable breeding stock."

Speaking of suitable cattle for the plains, Mr. Brown said, "the selection of cows and heifers must necessarily be confined to what can be had in the United States, and Canada—from among those grades or native stock, that by their whole stamp as regards roominess, form and disposition would throw the best possible grazer by the use of some thoroughbred bull. The character of such a cow, otherwise, should be a good ranger, that is action in searching for the best patches of grass; a good nurse, able to defend herself and her charge; not a wanderer; a home-comer when required; hardy as regards changes of climate, and keeping up well on indifferent pasture if necessary. Such are plentiful all over the continent at prices ranging from \$25 to \$40 per head. No difficulty exists, therefore, in knowing what kind of cows to use; the trouble, if any, lies in telling exactly what breed of bulls will clearly give us what we want from such cows and their offspring."

A table was submitted by the Professor, showing the maximum value of points of the Hereford, Aberdeen Poll, Short Horn, and Galloway bulls, taken at 100, as respects their reliability as breeders, impression power, giving early maturity, giving weight, grazing disposition, hardiness, least offal, quality of flesh, and permanency of character. Their tests stood—Hereford 87, Aberdeen Poll 87, Short Horn 83, Galloway 82. He was much in favor of Herefords, and said—"We find that while back somewhat in early

maturing, and considerably so in weight, this breed, which has 'breadth and depth without height' is, after all, second to none in view of the probabilities of our North-West grazings; they are so strong and impressive in power, hardiness, and especially in making flesh upon grass, that I am strongly of opinion we should look to them to lead in this great enterprise."

The capital required for establishing a ranch and carrying it on for two years was next considered. It included all settling down, house building, fencing of cattle station, enclosing corrals, in addition to the necessary number and variety of live stock, household maintenance, and some implements for ordinary cultivation. After this two year period some revenue should be accruing, though not necessarily so much as the annual average to be afterwards expected; because in place of selling all heifers along with the steers, the greater number would be retained to increase the breeding stock. The following is his estimate:—

Personal expenses of one examining ground and securing lease....	\$ 400
Price of four yearling bulls	1,600
Price of three thoroughbred heifers	900
Price of 250 cows and heifers at \$25	6,250
Price of two yoke of oxen	300
Twelve saddle horses (natives)	600
Total for live stock	10,050
Cost of dwelling house, stables, and shed	600
Fencing 100 acres as cattle station, the home property	500
Enclosing two corrals	150
Agricultural implements, tools, saddles, &c.	1,000
Unenumerated	300
Total for building, fencing, &c.	2,550
Household maintenance and personal expenses of three principals during two years	750
Wages and keep of two lads two years	2,000
Incidental expenses	250
	3,000
Rent of 2,000 acres.	40
Price of 100 acres cattle station	125
	165
Total capital required	\$15,765

In naming 2,000 acres as the size of the ranch, Mr. Brown said, "it will be evident we are calculating circumspectly *pro tem*, whatever the future may bring about. Until grazing locations become as regular as Ontario farms are to each other, our 2,000 acres may be 20,000 so long as neighbors don't push or out feed us in the number of stock."

But the most important part of this grazing question is the estimate of annual revenue after the first two years. In doing this we will assume the non-necessity of much winter keep to breeding stock, all required being an occasional bite of hay at more severe times,—the absence of any sweeping epidemic or extensive stealing, but allowing for ordinary proportion of deaths. Entering upon possession in, say early spring of 1881, the 250 breeding cows and heifers, less deaths and non-breeding, will have dropped 550 calves by August, 1883, one half of which will be two and a half years old, and their disposal then best as stores, the other half being yearlings and calves to be retained for another season's culling. Of these 275 head twenty-five heifers would be kept for filling up blanks among breeders, and 250 to be sold. In taking stock, therefore, on 1st September 1883, there should be about—

250 breeding cows and heifers.
275 yearling calves, steers, and heifers.
250 two-year-olds for sale.
<hr/> 775 head in all.

Estimate of increased value at the end of two-and-a-half years:

First draft of two-year-old steers and heifers, averaging 950 lbs. ;	
250 head at \$23, delivered at railway	\$5,750
Value of 275 yearlings and calves retained, at \$12	3,300
Value of seven additional thoroughbred bulls and heifers	1,500
<hr/> Gross increase from live stock. \$10,550	
Depreciation in value of older breeding cows and bulls, none over	
five years old	\$400
Depreciation in value of horses, oxen, implements &c	300
Miscellaneous debits	300
<hr/> 1,000	
Net increase during 2½ years	\$9,550

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at the end of five years there would be at least 45,000 head on the ten ranges, worth at least \$18 per head or \$810,000.

As regards the care and management of stock, we have the experience of our southern neighbors to guide us in a measure. On this subject a practical stock-raiser in Montana says—It is the custom in the west *not* to put up hay or build shelter for stock in winter, but I do not believe in this. Cattle can generally be grazed out all winter, but there are winters very severe, and not unfrequently dreadful storms, during which cattle die. The loss from one storm would be more than it would cost to cut hay for ten years. Besides my idea of a ranch is “home for man and beast,” and I would rather be at some expense than hear that the cattle suffer.

This view is sensible and humane. Herders and caretakers should be comfortably housed, and should as much as possible be men of families. They should each have some land under cultivation, which would occupy spare time besides being profitable. A race of “ranch patriarchs” would thus be introduced into the pastoral regions of the North-West, with all the refinements and enjoyments of the family circle.

Instead of remaining remote and isolated as it now is, the Bow River district will, in a year or two, have the advantage of being crossed by the main line of the Canadian Pacific Railway, which will open a highway, first to Eastern Canada, the Atlantic and European Markets, and soon thereafter a highway to British Columbia and the balmy shores of the Pacific Ocean. Every small ranch requires two or three employés, whose residences should form the centre of a village where dairying and other industries could be profitably carried on.

Sheep farming has not as yet been tried in the Bow River district, but there is no reason why it should not be as successful as in Montana, where an investment of \$15,000 in sheep pays thirty-five per cent. the first year, forty-seven

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per cent. the second year, and sixty per cent. the third year. Our mountain spurs and ridges, with their fine succulent grasses, pure water, gravelly creeks, and dry atmosphere, are peculiarly adapted to sheep husbandry, and under those conditions a healthier stock and better wool is obtained than the soil and climate of lower lands can produce.

The principal conditions of a sheep ranch is shelter, water, and dry grazing grounds. Sheep love a dry climate, and the higher and drier the soil the better it is for them. Describing a sheep ranch farther south a writer says—"This is a natural sheep range. The round mounds of which there are thousands in all directions are covered with buffalo and gramma grass. The pebbles in the brook clean the sheep's feet, and in winter when storms beat, the ravines and timber give their natural shelter. The snow no sooner falls than the winds blow it off the mounds, and no matter how deep it may be in the valley, by going up 200 feet the animals can get all the grass they want. There is plenty of timber, and, taken altogether, this is a perfect sheep paradise." The mounds correspond with our ridges, and amongst the foot hills and in the valleys there is excellent shelter.

In Montana, where there is no natural shelter, a sheep farmer says—"We put up walls of logs and cover them with poles and hay which are a sufficient protection against all storms in winter. We have never lost any sheep from severe weather in Montana. The only disease to which sheep is subject is scab, which is easily cured by an application of tremlock dip and tobacco juice. Sheep, when cured, remain safe unless they come in contact with diseased animals."

A sheep owner near Colorado Springs says—"At present I have about 3,000 sheep, a cross between the Mexican and the Merinos, about two-thirds of the flock being ewes. The cost of these is \$2 each, and the Merino bucks \$30 each. I keep two bucks to every 100 ewes. My average clip is 3lbs. per head a year, and I estimate the value of the clip at

thirty-five to forty cents per lb. It required only one man to herd the flock, and I pay him \$45 per month, including board. The bucks I keep in an inclosed pasture, commencing May 1st, and to be continued to December 1st of each year. I divide my herd, putting the breeding ewes in a separate flock from the wethers and lambs, requiring two herders, one for each flock; but I think it pays to incur the additional expense, and I shall keep it up in future. My average increase is about seventy-five per cent. for the ewes, or fifty per cent. for the whole flock per annum. In five years' experience I have never fed any hay or grain to my stock, and depend entirely on the native grasses, with a few exceptions, as in cases of sickness or some fine blooded bucks or ewes."

Wool has been carried by railroad from San Francisco for \$1.10 per 100 lbs. Double-decked sheep cars, carrying 200 sheep, can be had from the base of the Mountains to Chicago markets for \$150, thereby putting fat wethers in market at seventy-five cents per head. Dressed mutton carcasses are delivered from the Rocky Mountains to New York at \$1.75 per 100 lbs., carload rates.

As soon as stock is ready to be sent from Bow River district, equal facilities, if not better, will be furnished to all eastern markets by the Canadian Pacific Railway.

Oregon ewes and Spanish Merino and Cotswolds would doubtless thrive in the Bow River district. Their clip in Montana is given at from four to six pounds, according to the grade with Cotswold thoroughbred rams.

There is no question about horse raising proving a very profitable enterprise in the North-West. Native horses always winter out and keep in excellent condition. A few mares and thoroughbred stallions have already been imported. This season a large importation is expected from Oregon, Montana, and British Columbia. Horses raised in this country suit better for all sorts of work than those imported.

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The Canadian North-West from its situation and advantages, it is evident, is destined to become the chief stock-raising country in America. In a few years it will be difficult to find a vacant range in Wyoming, Nebraska, or Montana suitable or capable of sustaining 5,000 head of cattle. The Dominion of Canada, on the other, hand has "limitless" ranges waiting to be taken up and occupied.

CHAPTER XVII.

Water Supply.

Supposed Insufficient Rainfall—Souris Plain Thought to be a Desert—Settlement Proves the Contrary—Brackish and Pure Water—Where Saline Lakes and Ponds are Situated—Want of Running Streams Accounted for—Rainfall quite Sufficient—Prairie Fires the Cause of Apparent Scarcity—Surface Water Scarce in many Localities—Brackish Water always Preferred by Horses and Cattle—Moderately deep Wells Supply good Water—Cause of Poor Water on the Manitoba or Red River Prairie—Artesian Wells a Success at Winnipeg—How to Obtain good Water in any Part of the Country—Statements of Actual Settlers Regarding the Water Supply.

It is extremely difficult to give in a small space a comprehensive picture of a most important and practical matter, such as all conversant with the North-West must consider the water supply to be. Writers who only consider the average rainfall say without hesitation that the rainfall is insufficient. Why? Because there is less rainfall than in Ontario and other places where the country often suffers from drought. Others who visit the country in June and July, or even any time during the summer of the last two years, say there is too much. Formerly it was the fashion to say the country was a desert, and Palliser in writing of the Souris Plain, South-Western Manitoba, says:—"This central desert extends, however, but a short distance into the British territory, forming a triangle, having for its base the 49th parallel from long. 100° to 114° west, with its apex reaching to the 52nd parallel." Following Palliser, other writers reiterated his statements, until it became an article of belief that this country was a desert caused by insufficient rainfall.

Advance of settlement westward from Emerson showed that these condemned plains were exceptionally fertile, and to-day no lands are so highly spoken of. During the sum-

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mers of 1879 and 1880 I was sent to the southern prairies to explore, and at the same time examine into the various meteorological phenomena of the region in question. My reports were favorable and showed millions of acres of fertile land in a region regarded by public opinion as a desert. Last year the "Syndicate" decided on running the C.P.R. through this very region, and the Government sent in scores of surveyors to lay out the land, whose reports are now before the Government, and these without exception are favorable as regards the fertility of the soil and the richness of the prairie vegetation. Concerning the water supply there is much diversity of opinion, owing to the want of running streams in the greater part of the country. Many of the pools late in the season become brackish, and others dry up, leaving wide stretches without a drop of good water on the surface. Actual settlement alone will decide this question, and as settlers increase the scarcity of good water will decrease, because every man will dig his own well and get his own supply.

For years the water supply has been a prominent thought, and during my frequent journeys I paid attention to every matter connected with it. Salt or brackish water was found in close proximity to fresh water, and caused many conjectures to be expressed regarding its occurrence. Every salt lake, from the Riding Mountains westward, was found to have a hard gravelly bottom, and a careful examination revealed the fact that all were on depressions in the drift with their bottoms in Cretaceous clay, which is known to underlie the whole country. These lakes are fed partly by water running on the surface, but principally by springs issuing from Cretaceous clay close to the water. All the lines of salt lakes throughout the country will be found resting on these clays. Salt Lake, ten miles east of Shoal Lake, is a case in point. On one side of the road is the lake surrounded by a pebbly beach, on the other side,

higher up, is a fresh water pool, from which all travellers get their supply. Now it may be set down as an axiom that all water in pools surrounded by mud is fit to drink; but that, at certain seasons, those ponds, with a bare gravelly margin, should be shunned. Good water can be obtained, in my opinion, anywhere in the drift; but as soon as the Cretaceous clay either crops out or is reached by digging, poor, if not very bad, water will be found. This accounts for McKernan getting bad water at Hay Lakes, when he sank through the drift and penetrated into the Cretaceous clay. I am aware it has been said that the frequent fires burning the vegetation, and the rains washing the liberated salts into the hollows, cause these accumulations of saline matter. I know that terrestrial plants produce potash when burned, but not the salts which are found in the soils.

The dry, arid tract, around the Hand Hills, has more creeks, with flowing water, than are to be found in the much larger area of the Great Plain, where the soil is of a different character.

Here, near the Hand Hills, flowing water and cactus, with dried-up grass, and poor soil, gave another proof that the Cretaceous clay was a factor in more problems than one. It had been a question for a long time unanswered, why there were no creeks in the country farther to the eastward where the rainfall was greater. Here, where the rainfall is light, were numerous creeks, and the answer came at once; the impervious clay would not allow the rain to enter the earth, which therefore made its way to the creek and so to the river. In no other section of the country did we ever find the water running in streams on the surface after a storm, except in this locality. I account for the absence of creeks by the fact that the winter frost exerts a surprising pulverizing effect on friable soil, which permits both roots and rain to penetrate to a great depth.

Scarcely any running water, and little of what could be

called pure, is found on the Great Plain; but many ponds remain throughout the season, giving evidence that they are supplied from springs. Those that retain water all summer are easily known by their vegetation, River Weed (*Potamogeton gramineus*), Bladder Wort (*Utricularia vulgaris*), and a few other species being found in most of them. The level country on the other hand retains no moisture on its surface, except as marshes, the slightly undulating having possibly abundance in the early summer in wide depressions, yet by the middle of August, this disappearing to a great extent. It was on the gently rolling country, with a more or less clay surface soil, that difficulty was experienced in finding water. On rolling prairies or rolling hills, water was always abundant throughout the season, and the higher the knoll, the more certain we were that water in a deep pool lay at its base.

The rainfall, as I have stated in another place, is quite sufficient for all purposes, and pure water has been obtained without any difficulty wherever a settlement has been formed on the Second Prairie Steppe. Although we would travel sometimes one hundred miles without seeing flowing water, and often ten miles without seeing a drop of any kind, this was no proof of its scarcity. From Pine Creek to Boggy Creek, there are sixteen miles of prairie. Upon this prairie there was not a drop of surface water, when we crossed in 1875. Now, settlers are on every part of it, and abundance of water has been found at an average depth of fourteen feet.

To the question why, in a country which I assert to have a sufficient rainfall, there are no running brooks? I answer, that so long as the face of the land is covered with tall, or close matted grass or thick sward, the water *cannot* run off, and no brooks or stream valleys *can* be formed. The rainfall, taking place only in summer, is almost immediately absorbed into the soil and disappears. It was a noticeable

fact that Big Cut Arm Creek was very little affected by the almost continuous rains of June, and yet all the ponds and marshes were full, on the prairie, 200 feet above the bed of the creek. When we returned again, in the latter part of October, most of the ponds were without water, but the creek was nearly as high as in June. The water being absorbed by the soil remains in it, as it would in the finely pulverized earth of a flower pot, and is either taken up by the roots, which penetrate to a very great depth, or passes down into the sub-soil. No one, who has not lived on the plains, can properly appreciate the pulverizing effect of frost on the western prairies, where the snowfall is so light and the penetrating power of frost so great.

Let the sward be taken off by fire, or any other means, and instead of rain penetrating into the soil, it will run off into the hollows, and the land without grass will become drier. Clay soil that bakes without cracking, and land without sward, will necessarily allow the rain water to run off, and small streams will be found in the hollows, and eventually stream valleys will be the consequence. These we found at the Hand Hills, under the above conditions.

To receive the water, then, the surface must either be broken up or covered with a thick carpet of grass, which would act as a mulch; this mulch the soil finds in the old grass. It is quite true that horses prefer the young grass to the old and young mixed together, but it is just as true that fires passing over the country, where the rainfall is light, prevent nearly all the grass from seeding that year, and it is only the second year after a fire that seed in any quantity can be obtained. When collecting grasses and carices, I always obtained my specimens on the unburnt ground. It is quite possible that the plain appears less arid now than when Palliser crossed it, as owing to the absence of the enormous herds of buffalo, the grass now remains from year to year, if not burnt off. The term, "short, crisp grass of

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the prairie," which has become a household phrase, will not be applicable as soon as the fires cease, and where the water runs off now, it will pass into the soil through the old grass (or mulch). Three years without fires would change the growth of grass so much that many would think the rainfall had increased, when it was only retained by nature's own covering. On the prairie east of Long Lake, where the fire had not been, the grass was twice as long (July 4th) as where it had been burnt over; but the horses always went to the new grass, although quite short in comparison to the other. Here, the frequent fires had gradually lessened the surface loam and exposed many of the little pebbles scattered through it, and had we not dug into the soil we would have done as others did before us, classified the soil as gravelly, whereas it contains very little gravel.

Wherever the grass was long the ground was soft, but the reverse was the case where the grass was short from whatever cause. Mulching, then, is what the country wants, and it can never get this until stringent steps are taken to prevent prairie fires.

Salt lakes, ponds, and marshes are a characteristic feature of the country, but they attain their highest development on the Third Prairie Steppe. Many of these ponds, and even a few of the lakes, are fresh in the Spring, but after the middle of Summer they become brackish. Except the brackish water of the Touchwood Hills, of which I do not know enough to speak with certainty, all other was found in the deepest depressions. In no *coulée* was pure water obtained, except from a spring along its face. All other water in the *coulées* was more or less saline. Lines of salt ponds or lakes, sometimes of large dimensions, lay in the deep valleys, separating the ranges of hills on the high plains, and they were always to be found, whether the ground was high or low, where the Cretaceous clay came to the surface. Travellers too often descend into valleys for water, whereas

my experience shows that they should go out of them into the hills. The conclusion formed regarding the salt lakes and marshes is, that they rest on the Cretaceous clay which evidently contains salt, as I invariably found plants peculiar to a saline soil where this clay cropped out, and water oozed from it. In speaking of the brackish nature of the water oozing from these Cretaceous clays, I may remark that in examining the soil small crystals of selenite, pyrites, and other sulphurous minerals are almost always to be found, showing that it is to the presence of these deleterious ingredients that the water obtains its brackish character and must of necessity always be so. There is not a river or creek valley throughout the whole interior that lies 150 feet below the level of the prairie, along which you will not get salt marsh plants, if water in the form of springs, oozes out of this clay, which, as far as my observations go, is always there, though its presence is only detected by the salt marsh plants. Various species of grass were abundant on the marshy spots, of which *Brizopyrum spicatum* and *Spartina gracilis* were the most prominent. The former is the only grass on the plains which is really deleterious, and no horse will touch it except he is forced by hunger. Often it may be seen in company with Arrow Grass, (*Triglochin maritimum*) growing in salt marshes and covered with a white crust left by the evaporating waters.

Salt lakes and marshes are of frequent occurrence where sand hills join the plain, and salt depressions, either with or without water, are always found in this connection. Within the line of sand, however, good water is sure to be obtained in all cases. A little experience only is necessary to detect brackish water by inspection of the vegetation. None of the salt lakes or ponds have a marshy or black muck border, or contain any sedges, except *Scripus maritimus* and *pungens*. On the other hand, all the fresh water ponds have rich black soil around their margins, or are filled

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in every part with grass and various species of *Carex*, of which *Carex aristata* is the most prominent, and the one constantly eaten by the horses in Summer. Between the Little Touchwood Hills and the more western range, many ponds of water that are good in Summer are bad in October, owing to evaporation. Good water may always be known here, by the sedge in the ponds remaining green, close to and in the water; while, if the pool has become brackish, the sedges in the centre of it rot and apparently die.

Wells sunk to a moderate depth anywhere in the drift which covers the whole country, except in the baked clay flats and deep valleys between ranges of hills, will contain good water. All wells sunk *through* the drift into the Cretaceous clay will likely be more or less brackish. Hence, I advise all settlers to do as I advised Mr. McKernan, at Hay Lakes, when he obtained bad water by sinking a deep well, that he was to dig in the drift and never go through it, and good water would always be obtained. McKernan's well was fourteen feet deep, and the water unfit for use, while by digging a well about fifty yards to one side of the other, and only five or six feet in depth, he found good water (this well was dug 28th September, at the close of the dry season). All the country around Hay Lakes seemed to have but a thin coating of drift, yet the land was remarkably fertile and contained abundance of water on or near the surface. I consider the absence of water a good sign on the prairie. It shows that the soil is well suited for farming purposes, but it is no proof that water cannot be had by digging.

On the Lignite Tertiary Plateau, or Third Prairie Steppe, water, in many places south of the South Saskatchewan, at present is very scarce on the surface. Many brackish lakes are scattered over the country, but only one is known to the writer from which horses would not drink. A number of lakes are marked on our maps as "Stinking Lakes," which

are doubtless of this character. No water is known that is considered injurious to horses and cattle. Our animals seemed always to prefer the brackish marshes and their grasses to those where the water was sweet and good. Native horses never make a mistake in food and drink, and are always sure to find a supply of both, such as will prove best adapted to their wants.

On the Second Plateau or Steppe, good water, where not in pools on the plain or in the hills, can always be obtained by sinking less than twenty feet. Although salt marshes and pools are frequently seen, yet all wells already dug contain good water. The Red River Prairie has less good water than any other section, and a word of explanation is necessary to show the cause and indicate the remedy.

As far as is known, the surface soil of the Red River Prairie consists of silt or alluvium charged in nearly every part with salts of sodium and potassium. In the vicinity of Winnipeg these salts prevail to such an extent that common seaside plants, such as *Salicornia herbacea* and *Chenopodium maritima* are quite common in little hollows where water lies in the Spring. In 1872, I picked these up in the very centre of the main street of the City, where the Hudson's Bay Company's mammoth store now stands. All wells sunk into this silt or clay give bad or rather poor water, for the reason given above. On the undulations which are generally found in the plain, good water is always obtained. In these cases, the wells are sunk through the clay into the gravel which is always found beneath. The gravel is identical with that found along the shore of Lake Manitoba—a whitish limestone gravel derived from Devonian or Silurian rocks. In the neighborhood of Winnipeg, the clay is so deep that no well, up to last year, penetrated below it. As a matter of course, all water became bad after standing for a time in the well, and water for all household purposes had to be brought from the Red or Assiniboine

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Rivers. Last Summer, two or three artesian wells were sunk, and in each case first class water was obtained below the clay. About the middle of October last year, General Hammond, General Superintendent of the South Western Railway, had one sunk, and water was reached while I was there. If I remember aright, the well was a flowing one, but whether it was so or not the water was good.

It will be seen then that although there is little flowing water in the country there is abundance in pools in most localities, especially in the mixed prairie and forest region. On the First Prairie Steppe, the gravel will generally have to be entered before good water is obtained; while, on the next plateau, digging until water is reached is all that is necessary. Good water on the next Plateau, especially in the south, will not always be obtainable, except care be taken in selecting the location and intelligence be exercised in noting the character of the soil penetrated. Should the drift be passed through, the chances are that a failure will be the result. In this case I would recommend another trial, as only a few rods away excellent water may be found. Any pool that in an ordinary year contains good water late in September or October may be considered a spring, and here, were I the settler, I would locate my house. What is generally called bad water has a sweetish taste and may be considered a weak solution of *Epsom salts*.

The following statements of actual settlers will give some idea of the means used by them for obtaining a supply of water. I omit all who get their water from river, lake, or marsh, and only mention those who have dug for it. I omit the names of over thirty farmers who got their supply from the surface :—

NAME.	ADDRESS.	
B. Hartly.....	St. Charles.....	I have a clear water spring.
John Dilworth	High Bluff.....	There is a good supply of water by digging twelve feet.
George Cadman	High Bluff	A good supply of water by digging sixteen feet.

NAME.	ADDRESS.	
W. Jackson	High Bluff	A good supply of water by digging twelve feet.
W.n. Eagles	Stonewall	By drilling the rock we obtained good water.
A. Gillespie.....	Greenwood	I have sunk two wells twenty-two feet deep and have plenty of water.
S. C. Higgenson.....	Oakland.....	I got the very best of water by digging seven feet.
Allan Bell	Portage la Prairie..	Excellent water can be obtained by digging fourteen feet.
Jas. Stirton.....	Nelsonville	A spring creek runs through my land. Plenty of water at fourteen feet.
R. E. Mitchell.....	Cook's Creek	The water supply is good. I dig to the depth of fifteen feet.
A. J. Hunker	Green Ridge.....	I get very good drinking water from a well twelve feet deep.
F. Ogletree	Portage la Prairie..	I can get plenty of good water by digging fifteen feet.
Geo. C. Tucker	Portage la Prairie..	I have to dig from twelve to eighteen feet. My water is good.
A. V. Beckstead.....	Emerson	I have good water from a well eighteen feet deep.
A. C. Hervey	Poplar Point.....	A good supply of water can be had at from twenty to forty feet.
Philip McKay.....	Portage la Prairie..	I have a good supply of water from a well fourteen feet deep.
Angus Polson	Kildonan	I have a good supply of water by boring twenty feet.
Geo. Tidsbury	High Bluff	Good water can be got at the depth of fourteen feet from a well.
Thos. Sigsons.....	Portage la Prairie..	I get good water by digging twelve feet.
Thos. Dalzell.....	High Bluff.....	Splendid water can be got from a depth of from twelve to fourteen feet.
Amb. Wilson.....	Stonewall	Splendid water can be got from a depth of from fifteen to twenty feet.
R. Sutherland.....	Portage la Prairie..	We get plenty of water from twelve to fifteen feet deep.
G. Stranger.....	Poplar Point.....	We get plenty of good water at a depth of twelve feet.
Wm. Hill.....	Woodlands.....	I have good spring water at a depth of eight feet.
Niel McLeod.....	Victoria.....	I have a well of good water at a depth of sixteen feet.
A. Aylmer	St. Leon.....	Water can be got from the depth of ten feet.
R. Bell.....	Rockwood.....	We dug seventeen feet and struck rock. The water is plentiful and good.

Jas.

Jas. B.

Wm.

M. O.

Jame

Jas. B.

Jas. A.

E. W.

G. T.

Walt

J. Br.

A. M.

A. J.

S. Ba

J. Ap

Edw.

O. F.

C. L.

Max

John

A. T.

NAME.	ADDRESS.	
Jas. Whimster.....	High Bluff.....	I have plenty of good water from a well twelve to fourteen feet deep.
Jas. Stewart.....	High Bluff.....	I have plenty of water from a well ten to twelve feet deep.
Wm. Moss.....	High Bluff.....	I have a never failing supply of water at a depth of fourteen feet.
M. Owens.....	High Bluff.....	I have found good water at a depth of ten feet.
James Stewart.....	Meadow Lea.....	I have found good water at a depth of sixteen feet.
Jas. Ferguson.....	High Bluff.....	I have found good water at a depth of twelve feet.
Jas. Airth.....	Stonewall.....	I have a good supply of water, after digging and blasting twenty-four feet.
E W. Johnston.....	Springfield.....	I have good surface water, standing six or eight feet deep, and spring water at twenty-five feet.
G. Taylor.....	Poplar Point.....	Good water can be had at a depth of ten feet.
Walter Grierson.....	Meadow Lea.....	Good water can be had at a depth of sixteen feet.
J. Brydon.....	Portage la Prairie .	An abundance of water at a depth of ten feet
A. Macdonald.....	Stonewall.....	An abundance of water at a depth of ten feet.
A. J. Moore.....	Nelsonville.	Good water can be got from wells at a depth of fourteen feet.
S. Ballantyne.....	West Lynne.....	Good water can be got at a depth of ten to fifteen feet.
J. Appleyard.....	Stonewall.....	I can get plenty of water at twenty feet.
Edward Scott.....	Portage la Prairie..	I have good water in a well seven feet deep.
O. F. Knight.....	Ridgeville	Plenty of good water can be got from ten to fifteen feet.
C Logan.....	Portage la Prairie.	I obtain good water at a depth of fifteen feet.
Max. Wilson.....	High Bluff.....	I obtain good water at a depth of nine feet.
John Troop.....	Portage la Prairie..	I obtain good water at a depth of ten feet.
A. Nelson, Jr.....	Nelsonville.....	I got very good water from a well fourteen feet deep.

CHAPTER XVIII.

Fuel Supplies.

Scarcity of Fuel not Real—Views of the Canadian, the Englishman, and the Yankee—Supply of Southwestern Manitoba—Turtle Mountain—Moose Mountain a Source of Supply—Scarcity of Wood West of This—Cypress Hills—Government Reserves Fuel—Fuel Generally Sufficient in Manitoba—Supply for Pheasant Plain—Scarcity of Wood West of Touchwood Hills—Fagle Hills Supply—Fuel Abundant North of the Prairie—Peat Deposits Abundant—Their Distribution—Peat on nearly all Farms now—Mineral Fuel near the Boundary—Analyses of Coals—Value of the Lignites—St. Mary's River Coal—Analyses of Coals by Prof. Haanel—Souris Coal Field—Coal at Cypress Hills—Coal on Bow River—Its Value as Fuel—Red Deer River Coals—Crawling Valley Coal—Saskatchewan Coal Eighteen feet Seam above Edmonton—Analyses of these Coals—211 Miles of Coal Exposures on the Saskatchewan—25,000 Square Miles of a Coal Field—Edmonton the Centre of this Coal Field—Coal on the Pembina River—Peace River Coal—Coal at the Arctic Sea—Extent of Coal Field—No want of Fuel in the Future.

ONE of the chief obstacles to settlement in any country is the absence or scarcity of fuel. This objection has been urged with truth against settling on the Great Souris Plain, yet when fairly examined the objection loses nearly all its force. By many the absence of forests is considered an element of success. Each individual reasons from his own stand point. The dweller in Ontario feels that to be out of sight of woods is a calamity. He also believes that land covered with forest is *new* and therefore richer than the prairie, and rejects the latter and takes to *brush* and *forest*. An old countryman looks to the picturesque, and prefers some locality pleasing to the eye regardless of any other considerations. A practical Yankee will take a farm where experience tells him he can raise the greatest amount of wheat with the least possible expenditure of labor. He knows this to be on the open prairie, where there is no brush, very little water, and a gently rolling surface.

Perhaps twenty miles or more from his location is the

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source of his fuel supply, and he knows right well that the extra labor required to bring this to his home is more than saved by the ease with which he gets his land ready for the seed and the enhanced value of the crops he raises. Should a railway pass within twenty miles of him he gets his fuel by means of it and feels content. But there is no necessity for any person to be so far away from wood or a railway in the Canadian North-West, and, therefore, the fuel objection can be set aside, though I would impress on every settler the absolute necessity of knowing the exact position of his fuel supply before he locates.

Settlers in Southwestern Manitoba will get their fuel for many years to come from Turtle Mountain. Here there is not less than 300 square miles of woodland north of the boundary. The wood is chiefly poplar (aspen and balsam). Oak occurs abundantly on the flanks of the "mountain," and in many protected localities throughout the country.

Crossing the Souris Plain, the most wooded section, other than the valley of the Souris and its tributaries, is Moose Mountain, where there is abundance of fuel for a very large settlement for years to come. Like that on Turtle Mountain it is principally aspen and balsam poplar, with occasional oak, ash, and ash-leaved maple along the slopes.

In the Valley of Pipestone Creek, and on the Weedy, Wolf, and Squirrel Hills, there is sufficient aspen of small size to answer all purposes for fuel. West from this to the Rocky Mountains all large settlements must be supplied with coal until sufficient wood is grown by the settlers themselves. In the ravines along the east, north and west sides of the Cypress Hills there are very fine groves, which, with care, will serve that section for a long time, but here wood is not a necessity, as coal in inexhaustible quantities can easily be obtained.

There are very few sections of Manitoba far away from fuel. Where there are large open prairies, only a few

miles off, the Government has reserved wood for fuel for the settlers on these lands. Twenty acres of woodland is sold to each person settling on a prairie quarter section. All the country north of the Assiniboine, west of Portage la Prairie, has a sufficiency of wood, and this remark applies to the Little Saskatchewan, Bird Tail Creek, and Shell River River districts.

West of the Assiniboine and up the Qu'Appelle Valley as far as the Fishing Lakes, there is enough for present use, but the Pheasant Plain, which for twenty-five miles on the Carlton trail is without a twig, must draw its supplies from the Pheasant and File Hills, which are densely wooded with aspen and balsam poplar.

Lying west and southwest of the Touchwood Hills an immense tract without a bush extends to the source of the Qu'Appelle by way of Long Lake, and westerly to the South Saskatchewan. Wood procured on the Touchwood Hills must supply this district until coal is brought down the South Saskatchewan from above the mouth of Red Deer River. Except the little wood found in the valley of the Saskatchewan, no more, south of lat. 52°, is seen until we reach the foot hills of the Rocky Mountains.

Much fine aspen and balsam poplar are found on the Eagle Hills, which extend from Eagle Creek to and beyond Battleford. In these hills all the fuel needed on the great plain south of Battleford can be obtained. Southwesterly on Beaver Dam Creek, an affluent of Battle River, there are fine outcrops of coal.

Settlers north of the districts which have been particularly mentioned will never experience a scarcity of fuel. Settlement will cause the fires to cease, and the groves of young wood scattered everywhere over the country will soon become of great value for fuel and fencing.

Peat in inexhaustible quantities is found in all muskegs, and one source from which Winnipeg must draw her future

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supplies of fuel, will be the immense peat beds along the Canadian Pacific Railway east of Selkirk. All the true muskegs are formed out of the same material as the peat mosses of Ireland and Scotland. Peat moss (*Sphagnum acutifolium* et *cymbifolium*) is the basis, and Ericaceous shrubs and other bog plants make up the balance. Throughout the district between Lake Superior and Lake Winnipeg these bogs cover large portions of the hollows which are not now filled with water. West of Lake Winnipeg large tracts along the base of the Duck, Porcupine, and Pas Mountains are either quaking bogs or muskegs, and therefore all peat deposits. On all the watersheds lying to the northwest of the Saskatchewan, and extending to the extreme north down Peace river, peat bogs under the "generic" title of muskeg, are to be found. This source of supply is of more importance at the present time than many seem to believe. Many farmers living on prairie farms could at the present time supply themselves with excellent fuel by cutting and drying the black muck of the marshy spots on their lots, as it is a fact that few farms are without more or less marsh, and when the country was forest this was almost certainly bog.

In this connection I purpose reproducing an article on the coal deposits of the North-West from the pen of Dr. George M. Dawson, which, besides giving analyses of the coals of the Souris District, discusses the coal question in such an exhaustive manner that I give it almost entire:

"The mineral fuels met with in the neighborhood of the Line, fall naturally into two distinct categories. The first, including all except one, must be called lignites; the second, represented by a single example only, is a true bituminous coal. The first class includes not only, therefore, the great majority of the fuels met with in the vicinity of the forty-ninth parallel, but also almost all known in the interior region of the continent, both north and south of this line. They are emphatically *lignites* or *brown coals*, and though

they may be designated by the name *lignite coal*, inasmuch as they come under the generic class of coals; they certainly cannot properly be named by the latter word alone, as by it an entirely different kind of material is generally understood. The vast area and great importance of these beds of fuel should not be allowed to weigh in changing the name which would without any hesitation be applied to them, were their occurrence on a more limited scale. The word *lignite* has attached to it a definite mineralogical significance, and must be employed when it is desired to define the position of these fuels in the scale of combustible materials. Lignites are found in connection with many of the later geological formations, and differ from true coals in containing a larger percentage of water, hygroscopic and combined, a greater proportion of hydrogen, oxygen, and nitrogen, and less carbon. They also invariably give a brown streak or powder, yield easily a brown solution with caustic potash, and sometimes even to water, and, according to Frémy, may also be distinguished from coal and peat by their complete solubility in nitric acid and hypochlorites. The better kind of Tertiary lignites of the region now in question, differs from many foreign fuels of the same class in their small percentage of ash, but show for the most part distinct evidence of having been produced from wood, and would therefore even be classed as lignites under the most restricted meaning of that term. The wood, from its microscopic structure, has been coniferous, and may have belonged to the same species of *Thuja*, *Sequoia*, etc., represented by leaves in the associated clays."

"The lignites of the forty-ninth parallel appear to admit of classification under three leading types.

"*First*—Compact, homogeneous lignite without very evident traces of deposition planes. The woody structure often plainly apparent. Disintegration proceeding irregularly, or with reference to the structure of the wood. Generally

tough under the pick. This is the typical and most abundant variety, and includes many of the most promising beds.

Results of Assays of Lignites, water being estimated at an average of twelve per cent.

LOCALITY.	Miles West of Red River.	Thickness of Bed.		Fired Carbon.	Volatile Combustible Matter.	Ash.	Remarks on Ash.
		Ft. In.					
Souris Valley.....	255	2 " 3	Water estimated at 12 per cent.	45.48	39.77	2.76	Reddish White
"	263	3 " 2		46.18	35.90	5.92	Yellow-brown
"	263	1 " 5		31.51	50.02	6.47	Yellowish
"	263	1 " 0		38.08	44.57	5.35	Light Yellowish
"	263	6 " 6		34.82	48.30	4.88	Greyish-white
"	262			43.72	42.40	2.88	Yellow
"	263	7 " 3		49.31	33.98	4.71	Yellowish White
Traders' Road.....	308			48.93	31.61	7.46	Reddish
Great Valley.....	344	a few in.		38.65	43.02	5.43	Grey
"	344	5 " 0		48.61	34.90	4.49	Grey
"	344	3 " 0		36.92	44.95	6.13	White
"	346	4 " 0		38.63	44.48	4.89	Yellowish White
Porcupine } Upper part	390	18 " 0		46.20	35.14	6.66	Light Grey
Creek } Lower part	390	18 " 0		36.33	39.97	11.70	White
Rainy River				45.22	35.08	7.70	Yellowish Grey

"*Second*—Lignite more or less distinctly horizontally laminated, showing little apparent woody structure, but sometimes a not inconsiderable quantity of mineral charcoal. Not very tough under the pick, and on weathering breaking up along the planes. This form is probably also in almost all cases composed of wood, but the material has undergone more thorough decay before the deposit of the next highest beds

"*Third*—Soft and friable; often with much mineral charcoal, but frequently brownish and containing harder masses in some places. This variety no doubt often results from the thorough decomposition by the weather of either of the others, and beds with this appearance would probably change their character for the better, more or less completely, if penetrated beyond the outcrop. There appear, however, to be some beds of this nature throughout, and these have

been formed from peaty accumulations, with little wood. This class it is which is most apt to contain much ash, and the beds under it sometimes do not show clear lines of junction with the enclosing clays, but graduate into them.

"In the assays above given it has not been thought necessary to restrict the examination of those beds which are of workable thickness, as a general comparison of the various seams, thick or thin, is of more value in giving an idea of the average quality of the lignites of the formation now known, and those which future exploration may bring to light in the same region. The analyses, therefore, include a collection from the various sections, and several beds of good quality and thickness, with many of an inferior character, are unrepresented.

"Though giving the actual amount of hygroscopic and combined water, as found by analysis, it must be premised that it depends entirely on the conditions to which the lignites have previously been subjected, and that, by prolonged exposure to dry air, it might have been in many cases very considerably reduced. It has, therefore, been advisable in another place to reduce the results of all analyses to correspond to a certain percentage of moisture, that they may be better compared with each other and with foreign lignites. The water content has been taken in the table at twelve per cent., which has been adopted as the probable practical limit of dessication by dry air, under ordinary circumstances, of most of the samples. The lignites, it will be observed, are on the whole uniform in composition, and contain an average of over forty per cent. of fixed carbon when the water is estimated at twelve per cent. They thus fall somewhat behind the lignites found in the vicinity of the Union Pacific Railway, but it must be remembered that these only represent those seams which have been selected as workable from their good quality and thickness; and also that many of them belong to the extreme western part of the interior

continental region, and to the better class of lignites found in the vicinity of the Rocky Mountains, which are but slenderly represented in my collections. None of the lignites yield a proper coke. They merely shrink somewhat in size during the expulsion of the volatile combustible matter, and turn out of the crucible in a dry incoherent powder. The whole volatile matter is as might be expected, comparatively poor in luminous gases, and the lignites would, consequently, be of little use in the manufacture of illuminating gas.

"The ash is generally of pale colors, grey and white, passing into yellowish-white, being the prevailing shades. One or two only yield a deeply-colored ash, which is then brick-red. It is small in amount in most of the specimens, and does not usually appear of a nature to form troublesome clinkers. The lignites when burning yield a peculiar empyromatic odor, but no smell of sulphur, and indeed, as might be foreseen from the nature of the ash, the quantity of sulphur present is very small.

"The proximate analyses give in a general way the means of estimating the value of the lignites as fuels, but there are many other considerations which require attention. The ash is not greater, and in many cases less, than that contained in most ordinary coals, and cannot therefore be supposed to detract specially from the quality of the lignites. The amount of water present is, however, the most serious drawback, as it not only counts as so much combustible material, being already oxidized, but absorbs and renders latent a considerable quantity of heat which is necessary to convert it into the form of steam. Thus not only the total thermal effect of the fuel suffers, but the pyrometric intensity is reduced, which is a matter of special importance in metallurgical operations, and in the use of a fuel for raising steam, when the space allotted to the combustion is limited. Besides the quantity of oxygen present in these fuels, already

in combination with hydrogen to form water, there is an additional quantity,—not inconsiderable in amount and probably in the form of various bituminous compounds with carbon and hydrogen,—which as soon as combustion begins, combines also with the latter to form water. The weight of this oxygen, and the hydrogen necessary for its saturation, must thus also be deducted, together with the nitrogen, which is usually present in greater quantity than in true coals. We have then remaining a proportion of carbon and hydrogen which may be counted on for the useful production of heat, considerably less than that found in the same way for most true coals, but much in excess of that for wood or peat.

“By taking into account all these circumstances, with others of less importance, and applying the knowledge to the examination of the results of ultimate analyses of fuels, very exact estimates of their capabilities may be formed. Of the lignites of the interior regions of this continent, unfortunately but few reliable ultimate analyses are to be found, and of these only two apply to those of British North America. I had hoped to have added such analyses of some of the more important lignites of the forty-ninth parallel to this Report, but the time at my disposal has not sufficed. The analyses referred to are from specimens collected by Dr. Hector, and are as follows:—

	I.	II.
Carbon	56.50	50.60
Hydrogen.....	3.65	3.24
Oxygen.....	18.91	14.41
Nitrogen.....	0.80	0.90
Sulphur.....	0.60	0.42
Ash.....	5.62	15.93
Water (hygroscopic).....	13.92	14.50
	<hr/> 100.00	<hr/> 100.00

“No. I. From the Souris River, near La Roche Percée.
No. II. From a six-foot seam occurring near Fort Edmonton, on the north Saskatchewan. The calorific power of these

two lignites, as compared with that of pure carbon taken at 100, is fifty-nine and fifty-three per cent. respectively.

"One of the most important practical difficulties which has arisen in connection with the use of the lignites of the Western States, has been the cracking up of the material, on parting with its water, and its speedy reduction to fragments when exposed to the weather. It has, therefore, been found preferable to use the lignites, as soon as possible, after their extraction from the mine, even at the expense of an additional quantity of heat, lost in evaporating hygroscopic water. As the lignites do not form a coherent coke, this cannot be remedied, as it might be with most bituminous coals; lignite charcoals might, however, be produced; and though in most cases, these are found to be friable, many of the compact western lignites would probably give a good result. The lignites are, however, now extensively employed for locomotive engines, and other steam-raising purposes, and though not directly applicable to most metallurgical processes, must be used in the form of charcoal, and perhaps more profitably in gas furnaces after the pattern of those of Mr. Siemens; and, as settlement spreads westward, and these fuels are more in demand, many new methods will no doubt be found for their application. When they exist in the vicinity of land capable of agricultural settlement, they will be of great value, not only for domestic uses, but for the manufacture of bricks, tiles, and pottery, for which many of the enclosing clay and sand beds are very suitable.

"The St. Mary River coal, though unimportant in itself, from the thinness of the bed, is yet of great interest, as showing that there is a region toward the base of the mountains on the forty-ninth parallel, where fuel, better in quality than any heretofore found in the interior continental region, may be looked for. It is highly probable that important seams of similar coal exist even near the

Line; and I have heard of the occurrence of similar beds on the Belly River to the north. Some traders, indeed, brought a sample of coal to one of the Dépôt Camps on the Line, which being handed to the blacksmith, was before I returned to the place entirely consumed, it being well suited to smithy work, and thus differing from the lignites. I was unable to visit the locality from which this specimen came, but was informed that it lay about fifty miles northward, at the junction of the Waterton and St. Mary Rivers, that the bed lay nearly flat, and that what appeared to be the same seam was found on both rivers, being about five feet thick on the former and six on the latter. It would seem that the conditions of deposit and materials forming these coals and higher class lignites in the vicinity of the mountains, must have differed from those of the lignites further east. Metamorphism accompanying and caused by the folding of the formation, would probably convert a lignite into an anthracite, without allowing it to pass through the intermediate condition of a bituminous coal, and the bed last referred to and others of somewhat similar quality elsewhere, are found in a nearly horizontal position.

"Four analyses of fuels obtained by the Rev L. Taylor, and examined by Professor Haanel, of Victoria College, Coburg, have a very direct bearing on the question of the nature of the coals which may be expected to occur along the base of the mountains. The analyses appeared in the Toronto "Globe," in February, 1874, and their results may be thus summarized:—

	Sp. Gr.	Moisture given off at 212°F.	Volatile Matter.	Fixed Carbon.	Ash.
I.....	1.375	11.88	28.66	57.25	2.21
II.....	1.375	11.41	29.07	56.94	2.58
III.....	1.340	6.69	33.70	53.25	6.36
IV.....	1.337	6.89	33.57	50.90	8.64

"No. I. From the North Pembina River 100 miles northwest from Fort Edmonton. No. II. From near Belly River. No. III. From Belly River. No. IV. From the Saskatchewan River near Fort Edmonton. Professor Haanel thus describes the specimens :—' I and II are bituminous coals of bright lustre, irregular fracture, showing, to judge from the small specimens sent, no distinct lamination; of a high specific gravity, comparatively free from sulphur, and giving out little tarry matter upon coking. No. III and IV are also bituminous of a less specific gravity, lustre dull, distinct lamination; fracture at right angles to lamination, irregular with bright surfaces. Parallel to the place of lamination the slabs separated are dull, and give out considerable tarry matter upon coking.' It is stated that the two first do not form a coherent coke, and it is to be inferred from what Professor Haanel says, that the others do. Nos. III and IV much resemble the St. Mary River coal in composition, and come from the vicinity of the coal bed described to me as occurring at the junction of that stream with Waterton River."

The "Souris Coal Field" although the most spoken of is really as far as known the least in extent. In the summer of 1880 A. R. C. Selwyn, F.R.S., the Director of the Geological Survey, instituted a series of borings in the district, and struck a six foot seam at a depth of over 200 feet. In the same year I was exploring in the Cypress Hills and four miles south from the "Head of the Mountain," I examined an exposure which varied from six to fifteen feet in depth. The same coal was observed on the north side in Medicine Coulee, and was of the same character. Drift coal was likewise found in Battle Creek, near Fort Walsh, and it is reported from the eastern end near East End Post.

Besides the coal exposures referred to by Dr. George M Dawson along the International Boundary, there are numbers of others on the St. Mary River. On Belly River coal is

extremely abundant. Above Fort McLeod a settler, named Nicholas Sheran, works a mine in the river bank. This coal is considered a much better article than that obtained in Montana, and is taken to Benton for black-smithing purposes. Large quantities of it are burned at Fort McLeod in self-feeding stoves.

At and near the Black Foot Crossing seams of excellent coal crop out on many points of Bow River. A gentleman named French had burnt it in stoves for two years prior to 1879 and spoke very highly of its heating powers. About six miles north of the crossing I found a six foot seam in Crow-foot Creek. The lower part of the seam was below the bed of the stream, and may have been much thicker. I brought an armful of it to camp and found it an excellent article. We cooked our supper with it on the open prairie and it burned with a clear flame. In the morning though covered with ashes it was still aglow. We heaped a few pieces on the coals and they kept alive all day. The ash was quite white and no cinders were left. That obtained at the Cypress Hills burned just as well but the ashes were yellow.

While exploring in Red Deer River valley, south of the Hand Hills I carefully examined the rock exposures. Seeing a bold escarpment topping the bank at a particular point I went there and found a fine exposure of sandstone. The beds got harder as I approached the top, and for a few yards the rock on its upper surface was laid bare by the washing away of a seam of soft shaly lignite which lay immediately above it. The seam was about four feet in depth, and above it was a layer of quartzite gravel followed by the usual prairie drift. Scarcely a mile away I discovered a very fine outcrop of a first class lignite, at least five feet thick, in a small coulée opening into the "Crawling Valley." The beds at this point agree in no particular with those seen by Dr. Hector farther up the river. He states that the lignite observed by him was nearly on a level with the water, whereas this is close to the

surface. I believe these strata are referable to the same beds as those occurring at Porcupine Creek on the Boundary.

Many exposures of coal are to be seen on Red Deer River all the way from the Hand Hills to Tail Creek, where the exposures are very fine. On Battle river west of the Nose are numerous outcrops, which are best seen in the ravines leading into the river valley from the south. Proceeding west to the Saskatchewan between the Rocky Mountain House and Edmonton we again meet with numerous outcrops. These are described by Dr. Selwyn, Director of the Geological Survey, in the following paragraphs:—

“At one place on the right bank of the river, about forty miles below the confluence of Brazeau River, I found a seam of jet black coal, which measured from eighteen to twenty feet thick. It occurred of equal thickness in two exposures rather more than four miles apart. In the first exposure, which extends some fifty or sixty yards in length, but which, owing to the swiftness of the current running at its base, is not easily examined, the seam is almost flat, and rises from the water in a nearly vertical cliff, exposing eighteen feet of apparently excellent coal. The bottom of the seam here was beneath the water, and could not be examined; above it the cliff was not accessible, and the rocks were concealed by slides of earth and other debris. The second exposure, which is no doubt on the continuation of the same seam, occurs in an arched form, and shows eighteen feet of coal, with one, two to three inch partings of shale. The specimens of the seam which I collected, were all taken from the surface, and it is not unlikely that beyond the influence of atmospheric action the coal will prove of better quality than is indicated by these specimens. In the accompanying analyses, Nos. 2, 3, and 4, are of samples from the eighteen feet seam.

“No. 2 This specimen differed in appearance from all the

others, having a somewhat greasy lustre, and breaking with a conchoidal fracture. It contained :—

	SLOW COKING.	FAST COKING.
Water.....	11.81	11.81
Volatile combustible matter.	32.75	36.58
Fixed Carbon.....	53.36	49.40
Ash.....	2.08	2.21
	<hr/> 100.00	<hr/> 100.00

The powder was not at all frittcd. Ash, bright brick red.

"No. 3. A dull black coal, with marked planes of bedding and cleat, and containing much mineral charcoal. Two analyses gave :—

	SLOW COKING.	FAST COKING.
Water.....	10.90	10.90
Volatile combustible matter.	28.69	36.22
Fixed Carbon.....	54.96	47.84
Ash.....	5.45	5.04
	<hr/> 100.00	<hr/> 100.00

"On exposure this coal cracks and falls to pieces. The powder was not frittcd by either slow or fast coking. Ash, brownish grey.

"No. 4. Similar in appearance to No. 3, and containing :—

	SLOW COKING.	FAST COKING.
Water.....	13.93	12.93
Volatile combustible matter.	26.80	34.12
Fixed Carbon.....	52.28	44.95
Ash.....	7.99	8.00
	<hr/> 100.00	<hr/> 100.00

"At intervals, the whole distance from Rocky Mountain House to Edmonton, 135 miles, and thence to Victoria, seventy-six miles farther along the course of the river, similar rocks with coal seams and nodular ironstone layers, were observed.

"Dr. Hector has separated the Edmonton coal rocks from those in the vicinity of the Mountain House, by an intervening area which he considered to be occupied by a somewhat higher section or division of the Cretaceous series.

He did not apparently see the thick seam of coal which I found, as above stated, below the Brazeau River, about eighty-six miles from Rocky Mountain House; and another seam of five feet six inches thick, which I found at a point some fifteen miles higher up the river, as well as the numerous indications of seams which occur between the out-crop of the eighteen feet seam and Edmonton, probably also escaped his notice, as he travelled partly during the night, and in the winter, on the ice, when many of the exposures along the banks must have been concealed by snow. The observations which I was able to make descending the river do not enable me to say whether the seams retain their thicknesses or are connected for long distances, or whether the very numerous exposures and indications seen in the cliff sections represent more or less lenticular shaped and isolated patches, repeated at different horizons and over large areas. Dr. Hector appears to incline to the latter idea, and, in a note referring to the seams at Rocky Mountain House, he states: 'The coal beds are not continuous for long distances.' Whether this is actually the case or not, there can be no question that in the region west of Edmonton, bounded on the north by the Athabasca River and on the south by the Red Deer River, there exists a vast coal field covering an area of not less than 25,000 square miles; and beneath a large portion of this area we may expect to find workable seams of coal at depths seldom exceeding 300 feet, and often, as in the case of the thick seams above described, very favorably situated for working by levels from the surface.

"Coal seams have been seen on the Pembina River, a tributary of the Athabasca, 20 feet thick. It is also found on the McLeod, another tributary of the same river, and at Coal Creek, near the entrance to the Jasper Valley. In the elevated country, south of Little Slave Lake, many fine seams have been seen, and its occurrence on Peace River is

well known. Northward, the coal fields extend to the Arctic coast, and although many parts are so covered by drift that the existence of coal has not been verified from the extreme north to the southern boundary, yet enough is known to justify the belief that it does exist."

No person need fear the future as regards fuel, for if all the wood was gone, the stores of peat in the north and west would supply the demand, of 50,000,000 of people.

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LOGGING ON THE KENAYATIN.



CHAPTER XIX.

Timber Supply.

Minnesota Considered—Lake of the Woods—Line of the C. P. R.—Varieties of Timber—Where Located—Beren's River—No Pine West of Lake Winnipeg—Distribution of White Spruce—Black Spruce—Scrub Pine—"Cypress"—Balsam Poplar—Aspen Poplar—Cottonwood—Oak—Elm—Ash—"Sugar Maple"—Birch, Tamarac and Black Willow—Timber on Winnipegosis—Supply for Rapid City, Minnedosa, Odanah, Birtle—Riding Mountain—Duck and Porcupine Mountains—Timber North of the Saskatchewan—Athabasca Valley—At Edmonton—On Turtle Mountain—Cypress Hills—St. Mary's River—Timber in Bow River Country—Pheasant, File, and Touchwood Hills—Eagle Hills—Battle River—Red Deer River—Tributaries of South Saskatchewan—Conclusion.

THE timber supply for the North-West engages at present the attention of many thoughtful men. It is, therefore, necessary to collect in a small space all the information possible on the subject.

At present, Northern Minnesota sends a supply to the Red River Valley, but this in a few years will be exhausted, and our own country must be depended on for the enormous quantity that will be required. On the Lake of the Woods, Rainy River and its tributaries, and along Winnipeg River, there are large areas of forest where much fine timber is still to be had, but in no sense can these areas be called pineries.

Tamarac, White Spruce, Banksian or Scrub Pine, Norway Pine, White Pine, and White Cedar are met with in greater or lesser quantities. For such purposes as house-building, fence posts, railroad ties, or bridge building, there is an ample supply along the line of the C. P. R. It is true much of it is small, but it is sound and good, and scarcity enhances the value. When lumber of any kind brings \$20 per thousand, small size and presence of knots will never condemn the material. The various

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species of Pine are on the sandy ridges dividing the swamps, while the Tamarac and Black Spruce are found in the swamps. At Rat Portage and Eagle River are sawmills which manufacture large quantities of material used on the C. P. R., and much that is distributed over the country, as far west as Portage la Prairie. Rat Portage has the finest water power in the world and here in the future immense quantities of flour will be ground for the eastern markets.

Beren's River, about half-way up the east shore of Lake Winnipeg, drains a large district of country, and along its banks there are known to exist considerable areas of Pine lands, but whether Banksian or Red Pine is the prevailing species, our limited knowledge prevents us from ascertaining.

No matter what interested or other persons may state, Red and White Pine cease on the east side of Lake Winnipeg, and the only species found west of that is the Banksian Pine (*Pinus Banksiana*). White Cedar (*Thuja occidentalis*) is found in small quantity on the shores of Cedar Lake, north of the head of Winnipegosis, but no further west. The following list of the trees of the plains and the northern forests may be relied on as absolutely correct.

White Spruce (*Abies alba*) may be considered the most important tree throughout the North-West. Neither its habit nor habitat are in accord with eastern ideas. In its northern home it is a stately treer ising, with little diminution in size, to the height of 100 feet, and often having a diameter of nearly four feet. It is no uncommon occurrence to see fifty trees to an acre, averaging thirty inches in diameter. Its habitat, instead of being on sand or in wet swamps, is *always* on the mossy sloping-bank or side-hill or on the alluvial flats along a river.

Black Spruce (*Abies nigra*) is an important tree, north of lat. 54°. It is a curious fact that the writer never saw

this species a foot in diameter in any part of Ontario, but after passing north of lat. 54° , it was found nearly three feet in diameter south of Green Lake. As this is certainly the most northern species of fir, it is probable that the spruce forests, north of lat. 57° , may be composed exclusively of this tree. In Ontario, it loves the deep, cool, peaty swamps, but west of Prince Albert it leaves the bogs and is found on dry but mossy ground.

Banksian Pine (*Pinus Banksiana*) has often been confounded with Norway or Red Pine. It and *Pinus contorta* are the "Cypre" of the Half-breeds. The Cypress Hills get their name from the groves of the latter species at their western extremity. The former loves almost pure sand for a habitat, and hence, wherever there is a barren or sandy tract in the forest region of the North-West, this species is sure to be there. It is seen at Point aux Pins, west of Sault Ste. Marie, and attains a large size in many places along the Dawson Route, west of Lake Superior, and along the Thunder Bay Branch of the C. P. R., to and beyond Rat Portage. It is common between Duck Lake and Prince Albert, and near Fort à la Corne and in all the sandy country west and north of the Saskatchewan River.

Cypress, Sugar Pine, Black Pine or Twisted Pine (*Pinus contorta*) grows in fine and extensive groves on the western end of the Cypress Hills, but disappears about 500 feet below the summit, or 3,500 feet above the sea. About the same altitude, on suitable soil (it delights in poor soil), it is found along the eastern base of the Rockies, as far north as lat. 56° . In northern British Columbia, it is the most abundant forest tree. Neither of the last two species ever attain a large size, being seldom over 18 inches in diameter.

Balsam Poplar (*Populus balsamifera*) is a very important tree, both as regards its size and distribution. In the forest region where the soil is permanently damp or sub-

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ject to overflow at certain seasons of the year it takes the place of the Aspen. In all river valleys it is the most valuable tree, as it attains a large size and makes excellent lumber. Large quantities of boards were manufactured from logs cut in the Assiniboine Valley, above Portage la Prairie, in 1879. It is on Peace River, the Liard and the Mackenzie, where this tree assumes those dimensions which cause it to be reckoned the king of the northern forests. Here, a diameter of from six to eight feet is not uncommon, and trees from 60 to 100 feet in height without a branch are found in groves. It is a curious fact that this tree delights in the alluvial flats along the northern rivers, and not one aspen is ever found in this situation. It was only when we saw the aspen that we knew we were on the old bank of the Peace and Athabasca, when traversing the deltas of these rivers. Trees of this species are larger on the Liard in lat. 61° than anywhere else, and fine forests of it grow down the Mackenzie, north of the Arctic Circle, at Fort Good Hope.

Aspen Poplar (*Populus tremuloides*) may be called the characteristic tree of the plains. Wherever there is dry soil, not too sandy, outside of alluvium, there is aspen. I have passed repeatedly from aspen "bluffs" on the prairies, not twenty feet high, and with the trees not thicker than a walking stick, to continuous forests of stately trees, with their white trunks towering to the skies. Each time I have noticed that the forest was only kept in check by the annual fires. Until the willow and aspen roots had lost their vitality, they persisted in sending up crop after crop of stems ever increasing in number, until death by exhaustion took place and permanent prairie was formed. It has been frequently stated that aspen seeds remain in the soil, but this is not so. The reason it reclothes the ground so many times after being swept off by fire, is the fact that it throws up shoots from every root after a fire

has killed the stem. It possesses this quality, in common with all members of the Willow family, which it is well-known grow indiscriminately from either roots or planted stems, and very seldom from seeds. This provision seems necessary to this order (*Salicaceæ*), as in all cases the flowers are dioecious and two trees in close proximity are necessary to perfect the seed. Two notable instances of this are found in the White Poplar (*Populus alba*) and Lombardy Poplar, which produce no fertile seed in the absence of the staminate tree.

The Cottonwood (*Populus monilifera*) is found in the deep river valleys of the "Great Plains," and occasionally amongst sand hills, but in no place is it so abundant as to deserve particular notice for its economic importance, though, when found, it is usually of large size. It is the last remnant of the former forests of the south. Its thick coarse bark, like that of the Oak, preserves it from the repeated assaults of the annual fires, and enables it to escape when thin-barked trees succumb.

The Oak (*Quercus macrocarpa* var.) grows to a large size in many parts of Manitoba, but is unknown to the west of it. In that part of Manitoba, south of the Assiniboine and west of the Pembina Mountain, there are numerous groves of fine trees and much of the timber is valuable for a variety of purposes. It is also common on the White Mud River, and is frequently seen in groves along Lake Manitoba.

Elm (*Ulmus Americana*) is never found outside of river bottoms, except along Lakes Manitoba and Winnipegosis. It grows to a very large size in the valleys of the Red and Assiniboine Rivers, and often forms groves of large extent. In lat. 53°, along the Red Deer River which empties into the northern end of Lake Winnipegosis, are large groves of very fine elms often four feet in diameter. It is found in some abundance on Carrot River and the Saskatchewan, but is confined to low alluvial flats.

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Ash (*Fraxinus pubescens*) grows in the valleys of the Assiniboine and Red Rivers, often forming groves, but the timber, though frequently tall, never attains a large size. It is scattered throughout all the prairie country, and is found as a small tree in the river valleys and along the broken face of the Coteau and Cypress Hills. It is of no value for timber, but makes excellent firewood even when green.

"Sugar Maple," or Ash Leaved Maple (*Negundo aceroides*) is found in more or less abundance in all the river valleys, as far west as the 110th Meridian, and probably farther. When dry, it makes good firewood, but the fact that it becomes very crooked with age, in the wild state, prevents it from being of any value as a timber tree, even if it should attain the dimensions of one. Indians frequently make sugar from its sap, but the amount made is of little account, as groves of this tree are infrequent in most localities. In St. Paul it has been largely planted as a shade tree and grows very rapidly. It has a very handsome appearance, forms a fine head and has abundance of leaves. Within the last four years, these trees have been planted along many of the streets of Winnipeg. I would recommend every settler to sow a bushel of the seed of this tree the very first fall he arrives on the ground, as this is the tree of the future in Manitoba. It produces large quantities of seed which can be easily collected, and four years after it is sown, the trees are large enough to be planted out. The trees, not needed by the settler himself, can be readily sold to his less thoughtful neighbors.

In the foregoing synopsis, all species peculiar to the plains have been noticed, except Tamarac (*Larix Americana*) and Black Willow (*Salix nigra*). The latter frequently becomes a tree in the river valleys, but is scarce and of no value as wood, for it rots in the centre long before it shows signs of decay on the outside. The Tamarac

forms fine groves of tall, straight trees in many parts, especially on the watersheds, and in basin-like depressions found in the northern forests. In the swamps the trees are generally small, but on the dryer margins and mixing with the White Spruce on the hillsides or in river valleys are numerous fine trees often forming groves of many acres in extent. Birch (*Betula papyracea*) is frequent in the north, and a very excellent syrup is made from its sap by the northern Indians in spring.

Along the rivers flowing into Lake Winnipegosis, on islands in that lake, on the Fairford River, and at Ebb and Flow Lake are numerous groves of fine Spruce which, up to the present, are untouched, except the little taken out on the Fairford River and at Ebb and Flow Lake by Mr. Pratt, who owns a sawmill at Totogon. Enough Spruce grows in the neighborhood of these lakes to supply the country to the south for many years. Were sawmills erected at Lake Francis, the southern end of Lake Manitoba, and a tramway built thence to the C. P. R.—less than eight miles—a never-failing source of supply to the whole country would be opened up. Besides the above, very valuable timber,—Spruce, Aspen, Tamarac, and Balsam Poplar,—grows continuously along the eastern face of the Riding and Duck Mountains. All this timber can be drawn to the before-mentioned lakes, and so reach a market without difficulty.

Rapid City, Minnedosa, and Odanah will receive their supply from the Riding Mountain by the Little Saskatchewan, while Birtle and the adjoining country will obtain theirs from the same region, by means of Bird Tail Creek, on which there is a sawmill at present. Shell River penetrates the Duck Mountain, and fine Spruce was floated down this river and the Assiniboine to Brandon last Fall, where it is now being sawn into lumber for the use of settlers. On the head waters of the Assiniboine,

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there are groves of great extent in which, besides Spruce and Tamarac, both species of Poplar attain a large size.

My own observations and all the knowledge I could pick up from other sources, lead me to believe that valuable Spruce and Poplar forests are found around every points of the Porcupine Mountain. I know that the eastern and northern sides are continuous Spruce forests, along the base and far up the slopes. At the southern end I penetrated the hills, and found fine Spruce in groves of very considerable size occupying the slopes of the hilly or undulating country where I was, and forests crowning their summits.

Dr. Bell's assistant reached the top of the range at the head of Salt River, and reported Spruce trees 42 inches in diameter. Dr. Smith, who explored here in 1879, says:—"Careful exploration of the country north of the Reserve, for 12 miles, revealed a magnificent district, land excellent and much large Poplar, 24 to 30 inches in diameter. This was the character of all the region from the junction of Thunder River with Woody River and far northward, while southward, there was a stretch of rich but wet land, extending to Swan River. Westward of the Reserve, the country was heavily wooded with very fine timber, Poplar, Spruce, and Tamarac." The country spoken of above was that to the north and west of Thunder Hill on Swan River.

From a point, a little east of Fort à la Corne, and northwards, toward Green Lake, valuable Spruce, Tamarac, and Poplar forests, without a break, extend westward to near Lac la Biche. Northeast of Carlton and north of Prince Albert are fine forests which are easy of access at present, and on that account more valuable than those farther north.

Much fine Spruce exists in the valley of the Athabasca and on its upper tributaries, but, without the aid of a railway, as the river flows to the north it will be of little value for commercial purposes.

Above Edmonton, on the Brazeau and all the upper tributaries of it and the north Saskatchewan, are fine forests of Spruce, Tamarac, and Balsam Poplar. Here a large area will be found, well suited for lumbering purposes, as it is protected from fire by numerous marshes, and up to the present has remained in a primitive state.

Returning to the south, we find wood of considerable value in many parts of Southwestern Manitoba; as much of this has fallen into private hands, it will be well preserved and become invaluable in the course of a few years. Oak and Poplar are the principal trees. On Little Cypress River, which flows into the Assiniboine, there is some Spruce. At Milford, on Cypress river, a sawmill has been built, which is a great boon to the settlers in the vicinity.

On Turtle Mountain and Moose Mountain, Aspen and Balsam Poplar, large enough to be sawn into boards, are to be found in considerable quantity, and most probably some enterprising individual will start a "city" by building a sawmill at one of those points.

As I have remarked in another place, there is a large quantity of "Cypre" (*Pinus contorta*) between Fort Walsh and the western end of the Cypress Hills, but more especially within the Assiniboine Reserve, at the "Head of the Mountain." The trees are all tall and straight, but the greater portion does not average above a foot in diameter, although many reach eighteen inches. With care, this tree could be made available for many years for the stockmen and others coming into the country.

On the St. Mary's River, close to the boundary, Dr. G. M. Dawson saw *Pinus contorta* in some abundance, but not of large size. He says, in speaking of the Rocky Mountains that, "For this part of the country, the mountains form an inexhaustible source of wood for fuel and constructions, though extensive areas are known to be underlaid by coal. The timber in the mountains is chiefly coniferous and not

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of large size, except in certain secluded valleys. The Douglas Pine (*Abies Douglasii*) occurs on both sides of the watershed but is generally small. The largest timber observed was in some of the higher and more secluded valleys. The trees resembled the Black Spruce, but were probably *Abies Engelmanni*." Toward the heads of other branches of Belly River, Col. McLeod says, "good Pine is found on the slopes of the mountains and for some distance from their base, while Cottonwood trees of good size grow along the river bottoms."

While in the mountains at Bow River in 1879, I made a careful examination of the timber in the valley, as far as time would permit. The principal species were Douglas Pine and beautiful Spruce,—the latter growing tall and straight and forming groves on the flats. The other species preferred the rocky slopes, and were often of a large size, numbers being seen three feet in diameter. Fine groves of timber were observed on the south side of the Bow River, from the mouth of the Kananaskis up its pass and over the mountains between the two rivers. From the situation of the timber, I believe it to be principally Douglas Pine. I was informed that much finer timber could be seen higher up the river. By being carefully husbanded, there is enough timber on this river and its tributaries to supply all the prairie country as far as the Elbow of the South Saskatchewan. All the water-power necessary to convert it into lumber exists close to Morleyville. The river is so placid for its whole length that the lumber could be rafted to any point without loss.

In the Pheasant and File Hills, and throughout the Touchwood Hills, as also a tract of country lying east of Humboldt, there is abundance of wood for the prairie settlers for many miles on all sides of the hills. This wood is poplar of two species, and can be used in house building for walls, roofs, and floors.

West of the Saskatchewan, the Eagle Hills will furnish a supply for the northern part of the Great Plain. Battle River, throughout its entire length, will supply wood for all purposes to the country on both sides of it. Spruce, in some abundance, can be obtained on its upper waters and floated down to any required point. Red Deer River passes through a country more or less covered with forest, as far south as lat. 52° , but, after that, to its confluence with Bow River the only wood in the country it passes through is found in its own valley, or its bordering *coulées*. This is so small in quantity, in comparison to the district to be supplied, that it need merely be mentioned, but not taken into account. No doubt large quantities of Spruce exist on the upper waters of the river, and can be floated down to any point on the stream. There are no obstructions of any kind anywhere in the river, but on the lower part of its course it would be extremely difficult to get loaded wagons out of the valley which is not less than 500 feet deep.

Bow River, on the other hand, does not flow through forest on any part of its course east of the mountains, yet it contains many fine groves of Poplar from a few miles below the Blackfoot Crossing to the mountains, both in its valley and the *coulées* opening into it. Balsam Poplar and Cottonwood (*Populus monilifera*) are found of a large size at the Blackfoot Crossing, and numerous groves of Spruce are seen above Calgary. The whole country, on both sides of the river, is absolutely without wood, except in the tributary valleys, on the south of the main stream. Quantities of very good Spruce and Douglas Pine can be obtained on Dead Man's River on the north, on the Kananaskis on the south, and up the valley of the main stream for at least sixty miles above Morleyville. No difficulty will be experienced in floating down either logs or boards, as the river for many miles into the Rocky Mountains is free from dangerous rapids.

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It will be seen by the foregoing remarks that wood is scarce in the southern part of the prairie section, but this is in some degree compensated for by the immense deposits of lignite or bituminous coal known to exist. On St. Mary's, Belly, Bow, Red Deer, and Battle Rivers, these crop out in many places, and specimens burnt on the ground, and others brought home, testify to their value for fuel. As mentioned on another page, a trader and farmer named French has burned coal, taken from a six-foot seam at the Black-foot Crossing, for two years. He finds it burn well in self-feeding (base burners) coal stoves, of which he has two. While travelling in the country we used it in our camp and found it to burn equally well and for a long time on an open fire.

CHAPTER XX.

Mammals of the North-West.

Introduction—Enumeration of the Carnivora, of the Ungulata, of the Chiroptera, of the Insectivora, of the Rodentia—The American Panther, its General Appearance and Range—The Canadian Lynx, its Description and Distribution—Hunting on Peace River—Foxes, Anecdotes Respecting them—Wolves—The Coyote—The Grey Wolf, his Habits—Occurrence on the Plains—When easily Taken—Anecdotes Illustrative of their Cunning and Tenacity of Life—Pine Marten and Fisher—Wolverines, the Enemies of the Trappers—Anecdotes of the Wolverine—Mink and Otter—Skunks—Eaten by Hunters—Badgers and their Habits—Danger of Riding on Horseback—Mode of Killing Badgers—Notes on the Black Bear—Their Habits—The Terrible Grizzly—Fears of the Indians on Peace River—Nearly all Carry Scars Inflicted by Bears—Description of One Killed at the Hand Hills—Indian Woman Killed by a Grizzly—The Cabree or Prong-Horned Antelope—Black Tailed Deer—Wapiti or American Elk, its Distribution—The Moose—Hunting Moose an Art—Starvation on Peace River in 1875—Caribou Found in the North—Hunting on the Barren Grounds—The Rocky Mountain Goat—Description of It—Hunting in Bow River Pass—The Big Horn or Rocky Mountain Sheep—Measurement of their Horns—Musk Ox of the Barren Grounds—Its general Appearance and Habits—Warmth of its Covering—The Buffalo, its Distribution—Wood Buffalo on the Athabasca—Their Present Scarcity—Buffalo Hunting in the Past—Mode of Camping in the Indian Country—Mode of Running Buffalo—Exciting Scenes—The Charge, Conflict and Pursuit—The Buffalo Pound in Former Days—How the Indians Slaughtered the Buffalo—Doctor Hector's Account—Moles and Shrews, Rich Soil where they Are—Gophers and Prairie Dogs, their Habits—Mode of Catching Prairie Dogs—Beaver—Stories Related of their Instinct—Construction of their Dams—Beaver Houses—Their Construction—Muskrats, their Numbers and Habits—Character of Country they Inhabit—Muskrats as Weather Prophets—The Foolishness of the *Prophets*—How the Muskrat Builds his House—Pouched Gopher and Jumping Mice—Porcupines and their Habits—The Prairie and Woodland Hares—Great Numbers of the Latter—Rocky Mountain Hare.

OWING to our limited space very little more than a bare enumeration of species can be attempted, yet it is to be hoped that the few notes thus hastily thrown together may be of such interest as to cause many with an inclination for natural history to take up the work with zest and add much to our future knowledge. In the three following chapters will be found all the mammals, birds, reptiles, and fishes, with a few of the insects found in the North-West.

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To any one desirous of getting a full and complete account of the natural history of the country, I would refer him to Sir John Richardson's *Fauna Boreali Americana*, or the voluminous reports of the United States Zoologists. In the following epitome, however, I shall endeavor to give any person unacquainted with the subject a fair knowledge of the species with their distribution in the country, and occasional notes regarding their habits and peculiarities.

SYNOPSIS OF THE MAMMALS.

ORDERS.	FAMILIES.	GENERA.	SPECIES.
Carnivora (Flesh Eaters).....	4	11	26
Ungulata (Hoofed Mammals).....	1	8	10
Chiroptera (the Bats).....	1	2	2
Insectivora (Insect Eaters).....	1	1	5
Rodentia (the Rodents).....	7	17	32
Total..... 5	14	39	75

LIST OF THE SPECIES.

*I. Order Carnivora. (Flesh Eaters.)**Family I. Felidae. (the Cats.)*

1. *Felis concolor*, L. (Cougar or American Panther.)
2. *Lynx rufus*, Raf. (Wild Cat.)
3. " *Canadensis*, Raf. (Canada Lynx.)

Family II. Canidae (the Dogs.)

4. *Vulpes fulvus* var. *fulvus*. (Red Fox.)
5. " " *decussatus*. (Cross Fox.)
6. " " *argenteus*. (Silver and Black Fox.)
7. " *macrourus*, Baird. (Prairie Fox.)
8. " *velox*, Aud. and Bach. (Kit Fox.)
9. " *lagopus*, Rich. (Arctic Fox.)
10. *Canis lupus*, L. (White and Gray Wolf.)
11. " *lustrans*, Say. (Coyote or Prairie Wolf.)

Family III. Mustelidae. (The Weasels.)

12. *Mustela Pennantii*, Erxl. (Fisher, Black Cat.)
13. " *Americana*, Turton. (Pine Marten, American Sable.)
14. *Putorius pusillus*, Aud & Bach. (Least Weasel.)
15. " *Cicognanii*, Baird. (Small Brown Weasel.)
16. " *Richardsonii*, Bon. (Little Ermine.)



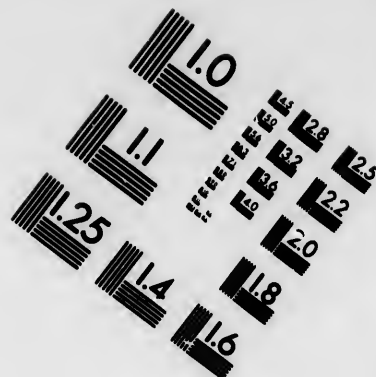
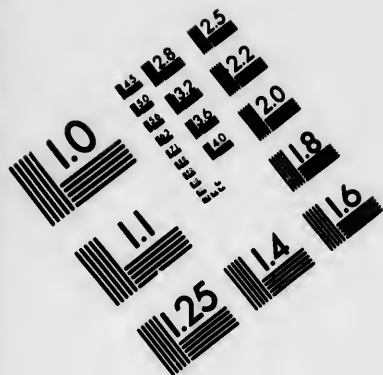
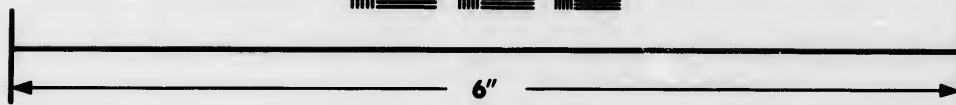
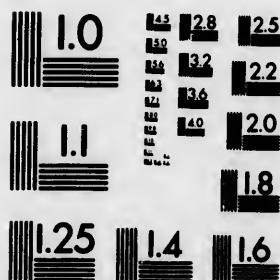


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17. *Putorius longicauda*, Rich. (Long-tailed Weasel.)
18. " *vison*, Rich. (Brown Mink.)
19. *Gulo luscus*, Sabine. (Wolverine.)
20. *Lutra Canadensis*, Sabine. (American Otter.)
21. *Mephitis mephitis*, Baird. (Common Skunk.)
22. *Taxidea Americana*, Baird. (Missouri Badger.)

Family IV. Ursidae. (The Bears.)

23. *Ursus horribilis*, Ord. (Grizzly Bear.)
24. " *Americanus*, Pallas. (Black Bear.)
25. " *cinnamomeus*, Aud. & Bach. (Cinnamon Bear.)
26. " *maritimus*, Linn. (White or Polar Bear.)

II. Order Ungulata. (The Hoofed Mammals.)

Family V. Cervidae. (The Deer.)

27. *Alce Americanus*, Jardine. (American Moose.)
28. *Rangifer Groenlandicus*, Baird. (Barren Ground Caribou.)
29. *Cervus Canadensis*, Erxl. (American Elk.)
30. " *Virginianus*, Bod. (Common Deer.)
31. " *Columbianus*, Rich. (Black-tailed Deer.)
32. *Antilocapra Americana*, Ord. (Antelope, Cabree.)
33. *Aplocerus montanus*, Rich. (Mountain Goat.)
34. *Ovis montana*, Cu. (Mountain Sheep. Big-horn.)
35. *Ovibos, moschatus*, Blains. (Musk Ox.)
36. *Bos Americanus*, Gmelin. (American Buffalo.)

Order III. Chiroptera. (The Bats.)

Family VI. Vespertilionidae. (Common Bats.)

37. *Vespertilio cubulatus*, Say. (Little Brown Bat.)
38. *Atalapha cinereus*, Coues. (Hoary Bats.)

Order IV. Insectivora. (The Bats.)

Family VII. Soricidae. (The Shrews.)

39. *Sorex pachyurus*, Baird. (Thick tailed Shrew.)
40. " *Forsteri*, Rich. (Forster's Shrew.)
41. " *Richardsonii*, Bachm. (Richardson's Shrew.)
42. " *palustris*, Rich. (Marsh Shrew.)
43. " *parvus*, Say. (Least Shrew.)

Order V. Rodentia. (The Rodents.)

Family VIII. Sciuridae. (The Squirrels.)

44. *Sciurus Hudsonius*, Pall. (Red Squirrel.)
45. " *Richardsonii*, Bach. (Richardson's Squirrel.)
46. *Pteromys alpinus*, Rich. (Rocky Mountain Flying Squirrel.)
47. *Tamias quadrivittatus*, Rich. (Missouri Striped Squirrel.)
48. *Spermophilus Franklini*, Rich. (Gray Gopher.)
49. " *Richardsonii*, Baird. (Yellow Gopher.)
50. " *tridecem-lineatus*, Aud Bach. (Striped Gopher.)

- 51. *Cynomys ludovicianus*, Baird. (Prairie Dog.)
- 52. *Arctomys flaviventer*, Bachm. (Yellow-footed Marmot.)
- 53. " *lateralis*, Rich. (Say's Squirrel.)
- 54. " *priuinus*, Gmelin. (Hoary Marmot.)

Family IX. Castoridae. (The Beavers.)

- 55. *Castor Canadensis*, Kuhl. (American Beaver.)

Family X. Geomyidae. (The Pouched Gophers.)

- 56. *Geomys bursarius*, Rich. (Pocket Gopher.)
- 57. *Thomomys talpoides*, Gibel. (Mole Gopher.)

Family XI. Zapodidae. (Jumping Mice.)

- 58. *Zapus Hudsonius*, Coues. (Jumping Mouse.)

Family XII. Muridae. (The Mice.)

- 59. *Hesperomys leucopus*, Raf. (White footed Mouse.)
- 60. " *Michiganensis*, Wag. (Prairie Mouse.)
- 61. " *leucogaster*, Baird. (Missouri Mouse.)
- 62. *Neotoma cinerea*, Baird. (Rocky Mountain Rat.)
- 63. *Arvicola gapperi*, Vigors. (Red-Backed Mouse.)
- 64. " *cinnamomea*, Baird. (Cinnamon colored Mouse.)
- 65. " *borealis*, Rich. (Northern Field Mouse.)
- 66. " *Drummondii*, And. (Rocky M. F. Mouse.)
- 67. " *Richardsonii*, Dekay. (Richardson's Mouse.)
- 68. " *xanthognathus*, Leach. (Hudson Bay Mouse.)
- 69. *Fiber zibethicus*, Cuv. (Musk Rat.)

Family XIII. Spalacopodidae. (The Porcupines.)

- 70. *Erethizon dorsatus*, F. Cuv. (White haired Porcupine.)
- 71. " *epixanthus*, Brandt. (Yellow-haired Porcupine.)

Family XIV. Leporidae. (The Hares.)

- 72. *Lepus campestris*, Bach. (Prairie Hare.)
- 73. " *sylvaticus*, Bach. (Grey Rabbit.)
- 74. " *Americanus*, Erxl. (Northern Rabbit.)
- 75. *Lagomys princeps*, Rich. (Little Chief Mountain Hare.)

In the preceding list will be found the greater number of the animals inhabiting the plains and the forests as far north as the Arctic Circle. A few notes on the distribution and habits of a few of the species may not be unacceptable to our readers, and therefore we will only attempt to describe the animals by a very few prominent features.

The American Panther or Cougar is the second in size of the North American cats, and is only exceeded by the jaguar. It is considerably larger than the largest dogs, the weight according to Audubon amounting sometimes to 150

lbs. The hair is throughout short and compact, close-pressed to the skin, but not very glossy; it is longest on the belly. The head is small, and the ears are large and rounded above. The paws are very large and with pads, as is found in other cats. In color this species is not dissimilar, when seen from a distance, to the common or Virginian deer.

Sir John Richardson gives its range as far north as lat. 60° in the Rocky Mountains, but it must be very scarce as none of the late exploring parties seem to have met with it. Should it be sought for it will likely be found in the Rocky Mountains, close to the boundary, and west of that range on the Columbia river.

The Canadian Lynx is about the size of a large setter dog. It is light bodied with long and thick legs, and the paws enormously large with long and sharp claws. In color it is generally grey with a light tinge of rufous. The ears are prominent and tipped with a pencil of very long hairs. Its large feet, prominent ears, and broad head distinguish it from all other cats.

This species is very common in the country bordering on Peace river, but, unlike the character it gets in Canada, it is here considered a harmless animal. Many thousands are killed every year, and their flesh is considered excellent food by the hunter. While descending Peace river, in 1875, we frequently noticed this animal on the banks. One evening we saw something swimming in the river and gave chase. It turned out to be a lynx swimming from one side to the other. At the point where it was crossing the river was fully 800 yards wide, and having nearly crossed it gave us some trouble to come up with it. A well directed shot laid it out on the water as if dead, when I immediately caught it and with some difficulty hauled it into the boat. As it came over the side it gave a kick, and one claw catching between two of my fingers left a scratch over three inches long up my arm above the wrist. This was the death

struggle, and I was thankful, as its claws were very serious weapons.

Foxes are abundant everywhere, and the several varieties are often found together. The common red fox is considered of little value, but the cross and silver foxes are highly prized, especially the latter. On the plains, foxes are very common and live in communities, or those of various ages live together. Often when camped for the night, young foxes would be seen playing around the holes which are generally understood to be "badger holes." In the early morning the old ones were often detected hunting for mice and gophers, and their stealthiness was only equalled by a cat trying to catch a bird. Half breeds when travelling on the plains often set traps for these animals at night after they camp. In the fall of 1875 half a dozen fine skins were obtained in this way on the trip from Carlton.

The Prairie Wolf or Coyote is often seen in groups on a distant hill top or heard around the camp at night, but is not considered dangerous, as it is of small size and noted for its cowardly habits. When buffalo were in immense numbers on the plains, these animals hung around the outskirts of the herds and picked up the refuse of the hunters, and with their almost constant noises kept the camp awake.

The Great Grey Wolf, however, is not to be despised, as it is a strong and powerful animal. While travelling in the Saskatchewan country the wolves would be seen dodging around the willow thickets and following the train as it passed along. Horses are very much afraid of them, and when one strays from the others, he keeps up a constant neighing until he finds his mates. In the bushy country between Calgary and Edmonton, wolves were often seen lying in the grass and cautiously raising their heads as the train moved past. South of Battleford, on the Buffalo plains, two stray horses were encountered in 1879, and each was badly hamstrung by wolves. They stayed with

us as long as they could keep up, but soon fell behind and possibly died that night. On the open prairies the large wolves are seldom seen, but as the forest is approached they become quite common, and cause some loss in the northern settlements every winter. Numbers of them are killed in March, when the snow is deep and a crust forms at night. The hunters start out on snow shoes, and soon bring them to bay in their haunts around the outlying settlements. In all my travels I never saw them attempt to attack or even face a man, yet they strike terror into the fiercest dog.

Archbishop Taché, in his sketch of the North-West, relates the following anecdotes as illustrative of their cunning and tenacity of life:—

“A fisherman was in the habit of entrusting fish to one of his dogs for his master. To prevent the dog being attacked by wolves, the man attached bells to the animal. The dog performed his duty daily for several consecutive winters; but, on one occasion, the bells being forgotten, the poor animal was eaten up, and the splendid fish that the delicate attentions of a poor servant intended for the chief of a post, became, with their carrier, a feast for wolves. While I was staying at Isle à la Crosse, three large wolves, one black and two grey, made havoc amongst our train dogs, eating several of them. Their cunning in avoiding traps enabling them to escape the death planned for them, a price was set upon their heads. An old Canadian, of the name of Morin, made a great effort to gain the reward, and the skins. A skilled trapper, made use of all his experience in setting his best spring traps, which, as usual, he fastened by a chain to a very large piece of wood. All the dogs were carefully locked up, and every other precaution adopted to make the three troublesome visitors hungry. Morin visited his traps daily, and everybody was in the habit of going to meet him on his return to learn the result of his expedition. The subject was the theme of the day. There came a furious

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storm during which the trapper remained at home. Calm weather followed, and the old Canadian went to visit his traps; in the distance he saw snow covering one of the three thieves that had been caught; a second trap had been set off unsuccessfully, and the third had disappeared; disorder reigned in the pack of wolves; the others never appeared again. Morin, after long and vain searching, was regretting the loss of his trap when, a month having elapsed, the people of Green Lake, about ninety miles from Isle à la Crosse, saw a wolf walking on one of their lakes, apparently with difficulty. Several dogs were sent after him, he was caught and killed. He was no other than one of the rogues from Isle à la Crosse, for the trap was still attached to his leg. The chain and log of wood were detached at the time of his companion's death; he had wandered in every direction through the forest for a whole month, dragging this heavy and cruel encumbrance in the midst of the most intense cold. This wolf was reduced to a mere walking skeleton, but the occurrence indicates a power and tenacity of life in the animal, difficult to understand."

The Fisher and Pine Marten are both highly prized on account of their furs. In the valleys of the Rocky Mountains and on Peace River in British Columbia, there are large numbers of the latter, which are here called Sable. While in the mountains, in the winter of 1872, I frequently accompanied the trappers when on their rounds looking after their traps. Their traps (dead falls) were baited with dried fish, and were so arranged that a man could visit them all without retracing his steps. Peter Toy, the great trapper of the Parsnip or Upper Peace River, told me that his line of traps took him a week to examine, and that the only enemy he had to contend with was the wolverine, which would frequently follow him and knock down all his traps.

Wolverines got a bad name from every trapper, but I believe they should rather be praised for their intelligence.

The only one I ever saw paid the penalty of its inquisitiveness. Myself and a number of Indians were ascending Peace River with two canoes, when, suddenly, a head with two bright eyes appeared above a log. The animal was detected by an Indian who, at once, got his gun and fired, but missed it. It ran only a few yards and hid itself occasionally raising its head to see what we were about. Its curiosity caused its death. A well-directed shot put an end to its life, and another trophy was added to the Indian's credit.

Archbishop Taché, in his sketch of the North-West, relates the following as his contribution to the biography of the animal: "This animal, as if to make up for the torpor of others of the family, is endowed with a feverish and very extraordinary activity, particularly in winter; yet it cannot run quickly, its progress is not even easy, except on well beaten pathways. About as big as a dog of only average size, it is able to commit depredations requiring strength and skill that often appear fabulous. It steals all kinds of things, not only food, but utensils, and even the long, heavy country saws, and hides them in the snow or elsewhere. I once witnessed one of these tricky performances of the wolverine. My fellow-travellers, coming to meet me, had left behind them in store, a double-barrelled gun, and a bag of provisions to be used on our return. Knowing the risk there was of losing these things, it appears they secured them. The gun was forced between the trunks of two trees that grew very close to one another; the bag of provisions was hung by a cord from the centre of a long pole resting on two trees at some distance from one another. On our return, we were surprised to find how a wolverine had treated us. Not only had he climbed one of the trees, but had even walked along the weak and flexible pole that appeared to be unequal to his weight, and gnawed through the cord by which the bag of provisions

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had been hung up. The food he had eaten, scattered, or buried, and the gun had disappeared. After a long search, we first found the leathern gun case, which had been taken off the gun, for it had been carefully put on to protect and conceal the piece. Then, in another direction and farther away, we found the gun under the trunk of a tree; leaves had been thrown over it, and scattered for some distance around as if to conceal the tracks of the thief. We should certainly have concluded that a man had been at work, had not the deep solitude of the forest obliged us to recognize the acts of a wolverine, of which traces were everywhere visible in the neighborhood. If the skillfulness of the wolverine sometimes insures him success, here is an incident that proves his mischief frequently brings punishment. An Indian had left his *lodge* without any one to look after it. A wolverine presently entered the deserted habitation, brought out, one by one, all the things he found inside, and hid them here and there, and even far away from the *lodge*. There remained only a bag of gunpowder. This the animal seized between his teeth, and concealed amongst the cinders in the fireplace. Some fuel still unextinguished soon burnt the bag, and caused an explosion of which the roguish wolverine was the first victim, for it stretched him dead on the spot, scattering the brains of the thief right and left."

Mink and Otter are frequently met with along river banks, but the latter more particularly at a bend where there is a short rapid, and their food more easily procured. Their slides (they can scarcely be called paths) down the river bank, are more like what seals would make than what would be expected from an animal that had four legs. On Peace River they are still abundant, and here are to be procured the best furs of that species.

On the prairie, Skunks are very common, and seem to live in communities, as they are frequently met with in numbers on little hillocks which they have perforated in

every direction. When descending the Assiniboine, last September, we saw numbers of them playing around without any signs of fear, and exposing themselves to instant death had we been so inclined. The Half-Breeds loose no chance of shooting them, and say they are excellent eating. When in my company, I noticed they took off the skin and the body was then hung under a cart for four or five days, and allowed to swing in the wind, before being cooked.

Archbishop Taché says: "When the animal (the Skunk) is carefully skinned, its flesh is far from being unpalatable. I have enjoyed a meal of it, and shall eat of it again whenever I shall have opportunity." It is curious that Chicago should literally mean the Land of Skunks. It is said to come from *chicak* of the Crees meaning Skunk.

Badgers were formerly very common on the plains, but of late years, they are far from common. On some parts of the southern plain it is extremely dangerous to ride on horseback at a rapid rate, owing to the multiplicity of badger-holes which dot the plain and are often concealed by the long grass. Ponies are so accustomed to these holes that if they are allowed to choose their own step, few mishaps occur. But when a gallant rider from the east mounts an eastern horse or a pony, and affects to guide him in eastern style, laughable scenes often occur. I once crossed the plain with a company of gentlemen, and not a day elapsed but some one was in trouble. Usually the horse would put his forefoot in a badger-hole as he trotted along, and the rider would float over his head. When he reached the grass, he would scramble for some distance on his hands and feet, dreading the hoofs of the horse which never followed him. As soon as the horse was relieved of his rider, he galloped off to join the band of loose horses that were driven with the party. No persuasion would entice the horse to give himself up, and it was only by the use of the

lariat (lasso) that he could be caught, and the gentleman remounted. One day, near the Hand Hills, my *Chief of Staff* was chasing a horse on foot, and the horse was galloping round with his eye on the man. While going at great speed, he put his foot in a badger-hole and turned a complete somersault. When he rose to his feet, he walked up to the man and gave himself up, looking quite crest-fallen.

Badgers are shy, and as soon as they see a traveller, take to their hole. After descending to the bottom, the animal at once comes up to the surface and peeps about to see what was the cause of his fright. Taking advantage of this, the Half-breeds run up to the hole and wait with the muzzle of the gun ready, so as to shoot him on his return. If he is not killed outright, it is almost impossible to get him out of the hole, he has such power in his hind legs.

Although Bears are quite plentiful in many parts of the country, they are seldom seen, except by hunters who go specially to look for them. They are ever on the alert, and on the least noise retreat into the nearest thicket with great alacrity. Black Bears are perfectly harmless, and are never known to attack human beings, although they would steal a young pig without any hesitation. Their food consists principally of berries and larvæ of ants and other insects, which they get by breaking in pieces or turning over the rotten logs strewed about in the woods. Scarcely a rotten log or billet of wood can be seen that has not the marks of a bear's claws upon it. Nor even a clump of berry bushes that have not been denuded of their fruit by them, yet in all last summer's explorations only one was seen, although we knew they were quite common in the bushes that filled the river valley. The fruit of the "Harouge" or Dog Wood (*Cornus stolonifera*) was their principal food in the valleys of the Swan and Assiniboine rivers.

Peace River is, however, the home of the bear, as within the Rocky Mountains the terrible grizzly makes his habitation, and often comes down to the plain and strikes terror into the hearts of the hunters. One night, in October 1872, I slept with an old Indian Chief on the bank of the Peace River, at Hudson's Hope, and it was only by the most eloquent appeals that I could prevail on him to stay with me and guard the provisions. All the other men crossed the river to the Hudson's Bay Company's post, to be safe from the bears. Next evening, I rode over the Portage, a distance of twelve miles, with Charette who had charge of the post. While crossing, darkness settled down on the woods, and to protect us from the bears, dogs were sent ahead and others kept behind, so as to give us notice of their proximity. I could not learn that they ever came up to attack a man, but it was certain they never left his path, and if met at any time a fight ensued, unless the man retreated.

Grizzlys were never hunted by the Beaver Indians, except in revenge for the death or maiming of a friend, and then it was done as a matter of duty. The size of their feet and the length of their claws make them terrible to encounter, as one blow from such an animal would tear a man almost to pieces. I have often seen claws six inches in length, worn as necklaces by the Indian girls, and considered as valuable *medicine*.

Many stories have been related about the terrible encounters which have taken place between this animal and the Indians. Scarcely a Beaver Indian could be found who had not scars on some part of the body, received in encounters with him. Instances have been related where Indian women out gathering berries have been carried off and afterwards escaped by simulating death. One bear killed at the Hand Hills in 1877 required eight shots before he was disabled. His feet were eight inches across, and were armed with claws five inches long. He was caught in the act of

killing a buffalo cow, and had just cracked her spine when he received the first shot. When stretched, his hide was as large as a buffalo bull, and when seen by me was used as a cart cover. The skull was brought away, and is now in the museum of Toronto University. Scarcely a tooth was found in his head which had not been broken, but the breadth of their bases told of their power unimpaired. The whole hide was covered with old wounds, and his general appearance led to the belief that he was very old. Besides the balls shot into him by his slayer, a number of others were found imbedded in his flesh. While Captain Palliser was in this section, in 1859, he relates a fearful occurrence which took place at that time about where the line of the Canadian Pacific Railway crosses the Bow River :—

“Several Indians from the Blood Indian camp came up where we had crossed to the south side and invited us to their camp. At about eight miles distance on our way there, we met a number of young men riding at full speed up the river to a point where a fearful accident was just reported to have occurred. Some women had been gathering berries there and came upon a bear. He at once seized one of them and dragged her into the bushes, one of the women having jumped upon a horse returned to camp with the news. The young men succeeded in killing the bear, but reported the woman not only dead but frightfully mangled.”

The Cabree, a Prong-horned Antelope, was formerly abundant on the great buffalo plains, but within the last few years nearly all have been killed by the starving Indians. South of Battleford, in 1879, they were in droves of ten to fifteen, but last year they had nearly all disappeared. Its erect carriage, beautiful mild eyes, and energetic motions give it a very pleasing appearance whether in motion or at rest. It is wonderfully fleet and can easily outrun a horse, but after running some time it will suddenly stop, and if the hunter hides, it will return and fall an easy prey. In the

rutting season it is still more inquisitive, and should it see a traveller or a hunter, will approach quite close and examine objects without fear.

In the south west, but more particularly in the bushy country, the Black-tailed or Mule Deer is occasionally met with. The Wapiti, or American Elk, was formerly very abundant on the prairie in the neighborhood of clumps of wood, but is fast disappearing with the advance of civilization. Moose Mountain and the ravines along the Coteau and Cypress Hills still shelter a few, but like the buffalo they will very soon pass from the prairie forever. Their numbers are rapidly decreasing both in the forest and along the base of the mountains, and a whole season may be passed without encountering one. A finer sight is seldom seen than a number of these animals careering over the plains. They stand about five feet high and are over eight feet long. Their horns are a grand object, being very symmetrical and altogether unlike the clumsy head of the moose.

On the Peace River plains and within the Rocky Mountains, the Moose is very abundant, and forms the staff of life for the greater number of inhabitants on that river. This is the largest species of deer and stands higher than a horse, but is much shorter. Its flesh to my palate is equal to that of the buffalo, and pemmican made from it is equally as good. Hunting moose is quite an art, as the animal is furnished with a long nose and large ears, which give very acute powers of hearing and a very fine sense of smelling. At all the Hudson's Bay Company's posts on Peace river, one or more hunters are constantly employed supplying the residents with meat.

Sometimes animals are not easily obtained or the hunters are lazy. At such times food becomes very scarce and the post master and his family are reduced to great straits. In the spring of 1875 the hunters failed to procure food, and Mr. McAuley, who had charge of the post on Battle river

(a branch of the Peace), and his whole family, were reduced to the very verge of starvation. After eating up every scrap of what we generally call food, the children roasted sinew and green hide and lived on them for days. When they were at the last extremity a moose was killed, and they at once passed from starvation to feasting. In August when I saw them they had all regained their flesh, and could laugh over their former distress. Many think that with the woods full of game it is not possible to starve, but it is just as well to remember that trained hunters are not always safe, then how about amateurs?

Passing to the northward we enter the region of the Caribou. What is usually called the Barren Grounds is their summer resort, and here they live in herds that aggregate many thousands. In spring and fall, as they pass and repass to their feeding grounds, they are met by the hunters and slaughtered in thousands. Should the fall hunt be a failure, as it is sometimes, all the Hudson's Bay Company's posts in the Mackenzie River District are in danger of starvation, and the fisheries are then their chief dependence. Caribou flesh is not so nourishing as moose, but still it is very good when not too lean. Its tongue is considered a great dainty, and is much relished by the natives and others.

The Mountain Goat is common on the Rocky Mountains above the tree line, but descends much lower when the cold of winter sets in. In general appearance it is exactly like the domestic goat, having a flowing beard, a full neck, and slightly curving dark-colored horns. The goat nearly equals the sheep in size. Its long white wool is silky and beautiful, and would certainly make fine and substantial cloth. While ascending Mount Selwyn, in the Peace River Pass, we collected a large quantity of this wool from the bushes as we passed upwards along their path. By throwing large stones over the precipices we caused them to run out from their hiding places, and their agility as they

jumped from crag to crag was very remarkable. In Bow River Pass they are very common, and with a glass may be seen almost any day eating on the mountain tops.

While encamped in the Pass in the Autumn of 1879, almost immediately under Grotto Mountain, a number of Stonies joined us. Shortly after one of their number pointed out three goats descending from the summit and eating as they came. A hurried consultation was held, and a few of the younger men started off to try and obtain the animals. In the course of an hour one of the hunters was observed crawling stealthily along a ledge almost on a level with the goats, which by this time had descended the mountain for a considerable distance. As we sat and watched him a puff of smoke, followed by the fall of one of the goats, told that he had got within range. In an instant the wounded animal was on its feet, and on three legs followed the others up the mountain. A number of shots fired in quick succession brought down another, and the wounded one fell dead at the eighth shot. The Indian like many of his tribe was armed with a Winchester rifle, and therefore fired very rapidly.

Laying aside his gun the Indian crawled carefully along a narrow ledge, and seizing one of the goats he threw it over the precipice, and we saw it roll over and over as it descended the mountain. The other quickly followed and going back for his gun he soon disappeared. Up to this time the other hunters had not been seen, but now one of them wearing a red shirt, made his way along the face of a precipice, and reaching the goats where they had lodged rolled them over the brink, and they shortly disappeared down a grassy slope. Half an hour had scarcely elapsed before our hunters returned and were publicly thanked for the moving panorama to which they had treated us. We tried the flesh but found it anything but palatable, as a disagreeable flavor pervaded every part of it.

The Big Horn or Rocky Mountain Sheep seems to prefer the wooded slopes and does not ascend to such elevations as the goat. Although its horns look like those of an enormous ram, its body and coat are those of the elk. Its flesh is very highly prized as it is certainly delicious. Its horns are very large, often weighing, with the head, over 50 lbs.

Professor Baird in his Report on the Mammals of the United States, speaks of certain heads, which he measured in the succeeding sentences:—"In an old animal the horns are nineteen inches apart at the tip, they measured fifteen and a half inches in circumference at the base, and twenty-eight inches in length around the curve. They weigh eighteen and a half pounds with the perfectly clean skull, lacking the end of the nose and the lower jaw. In the specimen brought by Captain Stansbury from the Rocky Mountains, however, the horns are eighteen inches in circumference at the base, the horn along the convexity measures thirty-six and a half inches, and the tips are eighteen inches apart."

Closely related to the Mountain Sheep is the Musk Ox of the Barren Grounds. This animal is often spoken of by Arctic travellers, but is almost unknown to the generality of readers. Archbishop Tache says:—"This animal is limited to the northernmost part of the continent, and is to be met on our most icy deserts. It is of the size of a small ox, and has most remarkable horns; these are very large and come so close together, at least in the male, as to unite into one horn at the base. I have seen plates a foot in diameter made of Musk-Ox horn. This ruminant, like all others in this department having heavy horns, is almost tailless. Its short legs do not prevent it from being very fleet; it descends very abrupt declivities with astonishing agility, and climbs them too with very great ease. The rocky character of some of the plains on which it lives does not interfere with its walking or even running. Like the Caribou it feeds on herbs and lichens. Providence, who placed this animal

in the polar regions and on perfectly woodless plains, has clothed it with the very warmest of coats. The Musk-Ox is covered with a double fleece. Long surface hair gives it the appearance of a buffalo, but its coat is longer and more silky, and on its back there is a light-colored covering. The under hair is close and fine wool, and protects the animal against the severity of the climate. Were this wool manufactured it would make very excellent cloth. As a robe nothing can be preferable to the Musk-Ox hide. I am indebted to a noble friend for one of these robes, made for my sleigh; it is made of four skins; it not only protects me against cold, but I should have regarded it as too luxurious had it not been given to me as it was."

The Bison or Buffalo, in former times, covered the great plains, both in summer and winter, and, to-day, their bones lie bleaching on the prairies from Pembina to the Rocky Mountains, and from the International Boundary to Peace River. It is doubtful whether the great herds passed constantly from the Saskatchewan to Peace River, but this, at any rate, is certain their bones lie on those northern prairies, and their paths yet seam the foot hills of the Rocky Mountains. In the winter of 1870, the last buffalo were killed north of Peace River, but in 1875, about 1000 head were still in existence between the Athabasca and Peace Rivers, north of Little Slave Lake. These are called Wood Buffalo by the hunters, but differ only in size from those of the plain. During the last three years, the great herds have been kept south of our Boundary, and as the result of this, our Indians have been on the verge of starvation. Where the hills were covered with countless thousands in 1877, the Blackfeet were dying of starvation in 1879. A few returned last fall, but they are only the remnants of the former myriads, and soon these will disappear never to return. While on the plains with the Half-breeds, many a spot has been pointed out where they had a splendid "run."

As they related the incidents of *conflict* their eyes would glow and their whole demeanor would change, so that they appeared different beings from what they were a few minutes before.

Buffalo hunting in former days, was peculiarly exciting and gave a zest to prairie life that was most bewitching to the young and adventurous. Twice a year, hundreds of families would assemble on the Red River plains, and placing themselves under the leadership of tried hunters and fearless Indian traders, start for the buffalo plains. When they entered the Indian country they coralled their animals every night, and set regular watches like soldiers in an enemy's country. Often, five or six hundred carts would be in the train, and every evening when they stopped for the night, these carts would be formed in a circle with their shafts inwards. After the horses had fed, they were brought within the circle and the watch was set. All men in the party were amenable to the same laws and assisted at the making of them, so that a Half-breed encampment was a small military republic.

When the party struck buffalo a permanent camp was pitched, and the "buffalo runners" (horses trained to hunt buffalo) were caught and examined. Scouts were sent out to locate a herd, and on their return, all the men intending to take part in the "run" presented themselves mounted, with gun on arm and whip in hand or rather hung by a thong to the wrist. Under direction of their Captain, they quietly separate in skirmishing order, and advancing under cover of the swells, almost if not altogether surround the herd. At a given signal all dash forward, as they charge, the light of battle shines in their faces, and their very steeds quiver with excitement.

Hurrying to the top of a hill, a *non-combatant* sees a wide and almost circular plain filled with horsemen and wild terror-stricken animals, dashing hither and thither, and

over all the confused tumult, the bellowing of bulls, and the sharp crack of the rifles are heard. Apparently the horses are moving without guidance. See that beautiful black dash up to a fat cow and almost halt, while his rider sends the death dealing bullet. Like a flash, the buffalo turns and charges the horse, but a slight pressure of the knee causes him likewise to swerve, and the buffalo dashes past. In another instant, the horse is again alongside, and another shot rolls her over dead. While we have been watching this episode a number of old bulls have led the way over the rise, and a few minutes elapse before the grassy plain is left untenanted, except by the dead and dying. The women now come on the scene and set to work, each apparently knowing those killed by her friends. On the return of the hunters it is found that over two hundred animals have fallen, and by the camp fires that night enough anecdotes of former 'runs' and reminiscences of Indian fights are told to fill a volume. After witnessing one buffalo hunt I cannot blame the Half-breed and the Indian for leaving the farm, and wildly making for the plains when it is reported that buffalo have crossed "the border."

Doctor Hector gives the following account of what he saw on the morning of the 26th December, 1857, about sixty miles to the west of Fort Pitt, in the valley of the Vermilion River:—"This morning we were off by 4.30 a.m., and had gone a considerable distance when we saw fresh traces of Indians, and soon heard the bawling and screaming of an immense camp, all in a high state of excitement. Diverging from our path to pay them a visit, we found that they had succeeded in driving a large band of buffaloes into their "pound" during the night, and were now engaged in slaughtering them. The scene was more repulsive than pleasant or exciting. The pound is a circular strong fencing about fifty yards in diameter, made of stakes with boughs interlaced, and into this place were crammed more than 100

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buffaloes, bulls, cows, and calves. A great number were already killed, and the live ones were tumbling about furiously over the dead bodies of their companions, and I hardly think the space would have held them all alive without some being on the top of the others, and, in addition, the bottom of the pound was strewn with fragments of carcasses left from former slaughters in the same place. It was on a slope, and the upper part of the fencing was increased in height by skins stretched on poles, for the purpose of frightening the buffaloes from jumping out. This is not needed at the lower part of the enclosure, as the animals always endeavor to jump up hill. The entrance to the enclosure is by an inclined plane made of rough logs leading to a gap, through which the buffaloes suddenly jump about six feet into the ring, and then they cannot return. To this entrance converge lines of little heaps of buffaloes' dung or brush for several miles into the prairie which surrounds the clump of wood in which the pound is concealed. These lines serve to lead the buffalo in the required direction when they have been driven into the neighborhood. When first captured and driven into the pound, which difficult matter is effected by strategy, the buffaloes run round and round violently, and the Indians affirm, always with the sun. Crouching on the fencing were the Indians, even mere boys and young girls, all busy plying bows and arrows, guns and spears, and even knives to accomplish the destruction of the buffaloes. After firing their arrows they generally succeeded in extracting them again by a noose on the end of a pole, and some had even the pluck to jump into the area and pull them out with their hands; but if an old bull or a cow happened to observe them they had to be very active in getting out again. The scene was a busy but a bloody one, and had to be carried on until every animal was killed, to enable them to get the meat. I helped by trying the penetrating power of rifle balls on the shaggy skulls of the animals with invari-

able success; and it is the least cruel way of killing them, as they drop at once. There are many superstitions connected with the whole business, and the Indians always consider their success in procuring buffaloes in this manner depends on the pleasure of the Manito, to whom they always make offerings, which they place under the entrance of the pound where I saw a collection of Indian valuables, among which were bridles, powder horns, tobacco, beads, and the like, placed there by the believing Indians, only to be stolen by the first scamp in the camp who could manage the theft adroitly. In the centre of the pound, also, there is a tall pole on which they hang offerings, to which piece of idolatry I was in a manner an accessory by giving them my pocket handkerchief to convert into a flag."

Moles and Shrews are very plentiful in many parts of the country. Wherever the soil is a rich, black, loose mould their mounds are in thousands, and it is very unpleasant to take a loaded cart over the surface. They are seldom seen as their lives are passed underground, and it is presumed that as the frost increases in depth in winter they are enabled to get below it. Any person prospecting for land can be assured of a great depth of rich and well-drained black mould wherever he sees their colonies. Where badger holes are, a dry and not porous subsoil is always found. Badgers never burrow in sand.

Gophers and Prairie dogs are very common in some localities, and cause much trouble to farmers, especially in the interior. The Striped Gopher is particularly abundant in the vicinity of Battleford and along the North Saskatchewan. On the buffalo plains and the open prairie generally the Prairie Dog (*Cynomys ludovicianus*) is very common. As the traveller passes along he is seen sitting in front of his house but when approached too near he dives into it like a flash. They are wonderfully inquisitive, and are hardly down until their heads are up again to see what is trans-

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piring. While lying in camp one Sunday with a number of Half-breeds we were much amused at the method adopted to capture the little fellows. Their holes are seldom more than three inches across, and when one was seen sitting on the edge of his hole he was approached, and of course immediately disappeared. A loop made of soft string was now put over the hole and the end held in the hand of a boy some distance away. Very soon the head appeared above the hole, the string was pulled, and as he felt the tightening cord he sank back into the hole only to make himself more securely looped. By this simple means half a dozen were caught in a short time, and another means of averting famine when without means of procuring other food was discovered. I have learned since that very frequently little boys and girls supply themselves with food for weeks together by this simple method.

Amongst the Rodents there is no animal of more value than the Beaver, and no one about which so much has been written. Much of it too is very far-fetched and greatly exaggerated. I remember reading in a school-book that they were just like choppers, and could fall a tree in any direction they choose. Now, this statement wants just one element—that is truth. Generally trees are cut on the slope of the river bank, and as this is always towards the water, when cut, they fall in that direction. It is different, however, if the tree is cut on the level, as it then falls the way the top leans, which is not always towards the water and just as frequently away from the river as towards it. While cutting, the beaver evidently sits on his hinder parts, and if the ground is level, the cut is at the same elevation all the way round. It is made precisely like the body of a sand glass, and frequently poplar trees eighteen inches in diameter are felled in this way. In constructing their dams in rivers, they take advantage of a fallen tree across the stream, and perhaps the lodgement of some driftwood against it. They

then set to work, and float down branches, roots, leaves, and twigs, and work them up with clay into almost a solid mass. On brooks, they cut willows and alders, and build a dam over which I have often taken horses. It is the dams across small brooks that cause so much flooding in the Peace River country, and other sections where the banks are not high. In very large rivers their houses are always in a drift pile, and here they often congregate by the hundred.

Having spent last summer where the beaver were very numerous, I had ample opportunity to study their habits, and probably broke up fifty of their dams in our passage up the various branches of Red Deer River. In September, they were laying in their supply of winter food. All the small trees and branches were cut up into lengths averaging about three feet, and carried or hauled to the water's edge when they were floated down to their store houses. In one place, I found a small dam in a brook close to the river, and following it up for more than a quarter of a mile, found that a colony of beavers used this as a canal down which they floated their food to the river, below the small dam.

On the borders of lakes or in still or slow flowing streams, beavers show their greatest ability. Here they build houses many feet in diameter, are so solidly put together that it is a matter of great labor to break them up. An eminent author who had ample opportunity to study their habits, speaking of their constructive powers, says: "Whole tribes unite to build villages. Houses, invariably of two floors, bear witness to the uniform genius of these architects. The pantry occupies the ground floor, while the leisure hours, amusements, and sleeping places of the family are reserved for the first floor. The walls and upper part are remarkably thick, sometimes measuring several feet. Then at the commencement of hard frost, the exterior is coated with a thick layer of mud, which immediately freezes and has the double advantage of perfectly shutting out the cold air, and of

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guarding against the attack of wolverines. The sagacity of the beaver is also seen in the care it takes, not only to lay in provisions in advance, but also in arranging creep-holes to insure its retreat in case of surprise and for its subsistence in a day of need. The most extraordinary works of beavers are the dams they throw across rivers and along the shores of lakes. In this matter one could not hesitate to grant them an engineer's diploma. Two points in their work attract attention: the skill and strength displayed in the construction are perfection in themselves; and even engineers with the same materials—branches and mud—have not been able to make such good roads as are made by beavers. He who looks at a beaver dam, or assists in taking one to pieces, must be struck with the remarkable simplicity of the construction, against which angry waves and floods of rapid streams dash themselves without effect. One wonders how the mud kneaded and applied by the beaver's paws, unassisted by even the trowel-shaped tail, becomes a hydraulic cement that time hardens instead of dissolving. How many are the secrets that nature conceals from science? The extent of these works is as surprising as their perfection. Some of them are really colossal, and several chains in length. Artificial lakes, of very considerable size, owe their origin to these dams. The extent of the dams is the most striking proof of the social habits of the beaver, for several families must have combined to carry them out, and if individual instinct produces the result of a general government amongst these laborers, they must necessarily be influenced by a sense of common interest."

Beaver and muskrat are widely different in their habits, and it is extremely easy to tell the character of a region of country by the number of these animals produced. Where beavers are numerous, the surface of the country is undulating and intersected by brooks and rivers, and covered with abundance of poplar, the bark of which is their principal

food. On the other hand, the muskrat is a marsh animal, and is found in multitudes in all marshy districts. Often as many as 20,000 rat skins are sent from Cumberland House alone, and, last year, fully 50,000 were taken from the country bordering on Lakes Manitoba and Winnipegosis. On Little Slave Lake, as many as 8,000 beaver skins have been collected in one year, showing the difference in the character of the two districts.

Musk rats are very common in all the pools and grass marshes along the line of brushy country, between the prairie and the forest. Here, their habits can be studied and their habitations examined. Weather prophets are in the habit of foretelling the winter by the Muskrat house, but like other guessers they know little of what they speak. Musk rats build their houses on the margins of ponds, and naturally one story of the house must be above the water. Should the autumn be dry, the pond lowers and the rat does little to his house; but if wet, he must add to its height, so as to lift it above the water, and when these weather-wise men look at the fresh built structure, they sagely shake their heads and foretell a severe winter, and *vice versa* if no additions have been made. Nearly all these wise sayings become mythical when looked at intelligently, and a more careful study of the habits of our wild animals will throw a flood of light on many peculiarities which, to-day, are remarkable if not mysterious.

I quote again from Archbishop Taché's book, as I find in it more accurate and truthful notices of the various animals of the North-West than I find elsewhere. I might give more of my own observations, but prefer to mix the ingredients so as to make the notices of these animals both entertaining and truthful:—

“The muskrat builds a house somewhat like the beaver's; being a weaker animal, it cannot transport heavy material; it makes use of the materials on the spot for its foundations

and walls; it uses the long grass or rushes of small lakes and marshes, in building its spherical dwelling; it does not pull up the grass, but merely binds it together with badly kneaded earth. While the robust beaver is satisfied with a rough flooring of branches, his little brother, the muskrat, makes a bed of straw for his delicate limbs; this is always placed above water level, although there is neither sub-structure nor gallery in the habitation.

"The pond is the rat's exercising ground and its store; it keeps breathing-holes in the ice, and to prevent these freezing up it stops them with a ball of clay or moss, visiting them from time to time to smell the pure outside air, or to breathe it at leisure. In summer, it digs holes in the banks of rivers, and in there it nestles its young thrice in a season. Its fecundity prevents its race from extinction. Its great losses are not due to the fortune of war alone; inundations, exceptionally severe winters, and accidents of which the origins are unknown, often carry desolation into the army of muskrats—fortunately the only kind of rat we have here. Our water-rats require water, and when they have none, which happens if the small lakes they have chosen in autumn for their abodes freeze up, they die of starvation, or pressed by hunger they eat one another. If for one reason they require water, for another they may have too much, for now and again they must land, which they cannot do when the country is flooded. They die, too, when, in spite of their skill and watchfulness, frost is so intense as to close up their breathing holes."

The Pouched Gopher (*Thomomys talpoides*) and the Jumping Mouse (*Zapus Hudsonius*) are great pests, being in thousands in many parts of the country, and causing great loss by their depredations. The former resembles a mole, but does not eat insects. I have known them to be so thick in potato patches that they undermined the soil, so that in walking over it you would sink up to the ankles.

As there are no rats yet in the country, it will not be difficult, as settlements increase, to get rid of this and all other native pests, as none of these can increase in the face of the breaking up of the soil.

In the sandy districts Porcupines are generally met with, but being rather slow in their movements are easily taken. They are generally found under pines, as they seem to prefer localities where they grow. In 1875, while with Dr. Selwyn, Director of the Geological Survey, on the Portage east of Peace River Pass, we noticed the dusting place of some animal under a bank. In the evening, Mr. Selwyn took up a gun, and very shortly after brought back a fine Porcupine. Its flesh was found to be very tender and juicy, and made excellent soup. The Indian and Half-breed women dye Porcupine quills of various colors, and work them into beautiful patterns when making certain kinds of embroidery for which they are noted.

Hares are abundant in the mixed prairie and poplar forest that extends all the way across from Winnipeg to the Rocky Mountains. Some years the country seems alive with them, while other years scarcely one is seen. In 1872 the country in northern British Columbia was full of them. About the middle of November of that year a party left Fort St. James on Stewart's Lake for the purpose of having an afternoon's hunting. Over sixty were shot in three hours, and the hunters claimed to be disappointed because they did not kill a hundred. During the month of September, 1875, while ascending the Clear Water River north of Portage la Loche, our provisions ran short, and for some days the men snared almost enough to supply us with food. The evening we reached the Portage we were altogether without eatables, and would have gone to bed without our dinners, had not a couple of squaws gone to the woods and brought us, in a few minutes, thirteen very fine hares. That same Autumn every little thicket was full of them, but I have not seen a dozen since.

The Prairie Hare is quite a large animal, often weighing ten pounds, and making a most delicious soup. Very few were met with in our wanderings, so that this species may be considered a scarce animal. A very small species of hare was met with in the Bow River Pass in 1879. This is the Little Chief Mountain Hare (*Lagomys principes*), and one never seen away from the Rocky mountains. It lives amongst the rocks and makes its *form* without burrowing, so that like the others it is a true hare. Its length is only about six or seven inches, whereas the Prairie Hare is often over twenty-four, and when running often looks like a Cabree, owing to the mirage that so frequently changes the size and relative distance of objects on the great prairies.

CHAPTER XXI.

Birds of the North-West.

Large Numbers Breed in the Country—Enumeration of Singing Birds—Notes on the Thrushes, Warblers, Swallows, Finches—Prairie Birds—Peculiarities of the Cow-bird—Blackbirds a Great Nuisance—The Fly-catchers, Enumeration of the Species—Night Hawks, Humming Birds, and Woodpeckers—All these are Forest Species—Range of the Humming Birds—Hawks and Owls—The Owl of the Prairie—Hawks very Beautiful and Abundant—Their Habits—The Wild Pigeon—Prairie Chicken, Ptarmigan and Grouse—Enumeration of the Waders—Numerous both in Species and Numbers—Plover—Avocets—Godwits—Sandpipers and Snipe in Myriads—Bitterns and Cranes often Numerous—Enumeration of the Ducks, Geese, and Swans—Their Breeding Places—Notes on the River Ducks—Countless Myriads in the Fall—Game Birds Around or in a Pond—A Common Sight—How to Procure a Supper—The Mergansers or Sheldrakes—Pelicans, their Habits and Breeding Places—Their Modes of Fishing—Gulls and Terns—Very Abundant on the larger Lakes—Their Summer Haunts—Loons, Grebe and Dab-chicks—Habits of the Grebe—The Great Western Grebe—Synoptical Table of the Birds—Notes on the Prairie Birds—Birds near Brandon in 1880—At Flat Creek—At Moose Mountain—Souris Plain—Around Salt Ponds—Multitudes of Ducks and Prairie Chickens—Taking to the Stubble Fields—Notes on the Hawks—On the Owls—On the Gulls.

BIRDS are a most important element in the present and future of the North-West. Having watched their habits and obtained their skins I am enabled to speak with certainty of many birds hitherto unknown in the interior. As they are better known by their families I shall introduce them in that way and take the highest order first.

Order I. Passeres.

This order is divided into two sub-orders, the Oscines and Clamatores.

The sub-order Oscines, or Singing-birds, is composed of nineteen Families, sixty Genera and ninety-five Species enumerated below :—

Robin,
Varied Thrush,
Hermit Thrush,

Turdus, migratorius, L.
Turdus, naevius, Bon.
Turdus, Pallasi, Cab

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Brow
Catbi
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Ruby
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Gray

- Olive-backed Thrush,
 Veery. Wilson's Thrush,
 Brown Thrush,
 Catbird,
 Arctic Blue Bird,
 Water Ouzel,
 Ruby Crowned Kinglet,
 Chick-a-dee,
 Hudsonian Chick-a-dee
 House Wren,
 Winter-Wren,
 Long-billed Marsh Wren,
 Horned Lark,
 Wagtail,
 Missouri Skylark,
 Black and White Creeper,
 Nashville Warbler,
 Orange-crowned Warbler,
 Tennessee Warbler,
 Summer Yellow Bird,
 Yellow-rumped Warbler,
 Black and Yellow Warbler,
 Black Poll Warbler,
 Orange-throated Warbler,
 Yellow Red-Poll Warbler,
 Golden-crowned Thrush,
 Water Thrush,
 Maryland Yellow Throat,
 Mourning Warbler,
 Green Black-capped Fly-Catching Warbler,
 Canada Fly-Catching Warbler,
 Redstart,
 Barn Swallow,
 White-bellied Swallow,
 Cliff Swallow,
 Bank Swallow,
 Purple Martin,
 Bohemian Chatterer,
 Cedar Bird,
 Red Eyed Vireo,
 Brotherly Love Vireo,
 Butcher Bird,
 White-rumped Shrike,
 Evening Grosbeak,
 Pine Grosbeak,
 Purple Finch,
 American Red Crossbill,
 White Winged Crossbill,
 Gray Crowned Finch,
Turdus Swainsonii, Baird.
Turdus fuscescens, Baird.
Harporhynchus rufus, Cab.
Mimus Carolinensis, Gray.
Sialia arctica, Swains.
Cinclus Mexicanus, Swains.
Regulus calendula, Licht.
Parus atricapillus, L.
Parus Hudsonicus, Forster.
Troglodytes aedon, Vieill.
Anorthura troglodytes, Coes.
Cistothorus palustris, Baird.
Eremophila alpestris, Boie.
Anthus ludovicianus, Licht.
Neocorys Spraguei, Sel.
Mniotilta varia, Vieill.
Helminthophaga ruficapilla, Baird.
 " *celata*, Baird.
 " *peregrina*, Cab.
Dendroica aestiva, Baird.
 " *coronata*, Gray.
 " *maculosa*, Baird.
 " *striata*, Baird.
 " *Blackburnia*, Baird.
 " *palmarum*, Baird.
Siurus auricapillus, Swains.
 " *naevius*, Coes.
Geothlypis trichas, Cab.
 " *Philadelphia*, Baird.
Myiodiocetes Canadensis, Aud.
 " *pusillus*, Bon.
Setophaga ruticilla, Swains.
Iirundo horreorum, Barton.
Tachycineta bicolor, Cab.
Petrochelidon lunifrons, Cab.
Cotyle riparia, Boie.
Progne purpurea, Boie.
Ampelis garrulus, L.
 " *cedrorum*, Baird.
Vireo olivacea, Bon.
 " *Philadelphia*, Cass.
Lanius borealis, Vieill.
 " *excubitoroides*, Swains.
Hesperiphona vespertina, Boie.
Pinicola enucleator, Cab.
Carpodacus purpureus, Boie.
Loxia curvirostra, L.
 " *leucoptera*, Gmel.
Leucosticte tephroctis, Sw.

Red Poll Linnet,	<i>Agiothus linarius</i> , Cab.
Mealy Red Poll,	" <i>canescens</i> , Gould.
Yellow Bird, "Canary,"	<i>Chrysomitris tristis</i> , Bonap.
Snow Bunting,	<i>Plectrophanes nivalis</i> , Meyer.
Lapland Longspur,	" <i>Lapponicus</i> , Sel.
Painted Lark Bunting,	" <i>pictus</i> , Swains.
Chestnut Collared Bunting,	" <i>ornatus</i> , Towns.
Baird's Sparrow,	<i>Centronyx Bairdi</i> , Bon.
Savanna Sparrow,	<i>Passerculus Savanna</i> , Bon.
Grass Bird,	<i>Passerculus gramineus</i> , Baird.
Leconte's Sparrow,	<i>Coturniculus Lecontei</i> , B.n.
Lincoln's Sparrow,	<i>Melospiza Lincolni</i> , Bon.
Swamp Sparrow,	" <i>palustris</i> , Baird.
Song Sparrow,	" <i>melodia</i> , Baird.
Snow Bird,	<i>Junco hyemalis</i> , Sel.
Oregon Snow Bird,	" <i>Oregonus</i> , Sel.
Tree Sparrow,	<i>Spizella monticola</i> , Baird
Chipping Sparrow,	" <i>socialis</i> , Bon.
Field Sparrow,	" <i>pusilla</i> , Bon.
Clay-colored Sparrow,	" <i>pallida</i> , Bon.
White-throated Sparrow,	<i>Zonotrichia albicollis</i> , Bon
White-crowned Sparrow,	" <i>leucophrys</i> , Swains.
Black-throated Sparrow,	" <i>querula</i> , Gam.
Fox-colored Sparrow,	<i>Passerella iliaca</i> , Swains.
White-winged Blackbird,	<i>Calamospiza bicolor</i> , Bon.
Rose-breasted Grosbeak,	<i>Goniaphea Ludoviciana</i> , Bowed.
Arctic-spotted Towhee,	<i>Pipilo arctica</i> , Swains.
Bob-o-Link,	<i>Dolichonyx oryzivorus</i> , Swains.
Cow-bird,	<i>Molothrus pecorus</i> , Swains.
Red-winged Blackbird,	<i>Agelaius phoeniceus</i> , Vieill.
Yellow-headed Blackbird,	<i>Xanthocephalus icterocephalus</i> , Baird.
Meadow Lark,	<i>Sturnella magna</i> , Baird.
Western Meadow Lark,	" <i>neglecta</i> , Aud.
Baltimore Oriole,	<i>Icterus Baltimore</i> , Daud.
Rusty Grackle,	<i>Scolecophagus ferrugineus</i> , Swain.
Blue-headed Grackle,	" <i>cianocephalus</i> , Cab.
Crow Blackbird,	<i>Quiscalus purpureus</i> , Licht.
Raven, Barking Crow,	<i>Corvus carnivorus</i> , Bert.
Common Crow,	" <i>Americanus</i> , Aud.
American Nut Cracker,	<i>Picicorvus Columbianus</i> , Bon.
American Magpie,	<i>Pica Hudsonica</i> , Coues.
Blue Jay,	<i>Cyanurus cristatus</i> , Swains.
Whiskey Jack,	<i>Perisoreus Canadensis</i> , Bon.

It is not necessary to enter into details regarding the species singly, but a few remarks on the various groups may be interesting to not a few.

The Thrushes are represented by seven species, which

have their homes either in the thick forest or in the thickets bordering on the prairie. The Catbird, Robin, and Hermit Thrush are very common and are found everywhere. The Shore Lark and Lapland Longspur are very common on the prairies in September and October, and are frequently taken for Snow Buntings. While passing along the trail the traveller will see these birds running before him in the ruts, and when he approaches too near they rise up and fly some distance ahead, keeping this up for miles.

Of the seventeen warblers none belong exclusively to the prairie. All are birds of the thickets, and being very shy are not often seen except by the collector, who follows them to their haunts and occasionally gets a glimpse of their bright colors as they retire to the thickest coverts on his approach.

When going up or down a river the Bank and Cliff Swallows are often seen in myriads circling around. The former, where the bank is alluvium often perforates it to the depth of two or three feet, while the latter will cover the hard face of a clay cliff with thousands of nests, and as you glide past, from every nest one or more heads are protruded to gaze on the passing stranger. The Red Eyed Vireo fills the forest with its song, and were it not carefully watched would be taken for a variety of birds, as it has quite a variety of notes in its song.

The Finches as usual are well represented both by forest and prairie species. Many of these birds are very beautiful, especially the Evening and Rose-breasted Grosbeaks. These birds live in the thick forests, and the song of the latter is often heard answering that of the Baltimore Oriole, which breeds in the same localities. On the plains near Old Wives Lakes the White Winged Blackbird and the Missouri Skylark are common, and will at once attract the attention. The former by its uncommon plumage, and the latter by its peculiar flight which might be correctly termed undulating.

Of all the birds on the prairie none will attract more attention than the Cow-birds. As they build no nests they are great travellers, often keeping with a train of carts crossing the trackless plains for weeks together. Both in 1879 and 1880, while travelling without a trail, these birds have kept with us for weeks. When on the march they would fly alongside the carts and light in the grass, and immediately pounce on any grasshopper which lit near them. In July when Bull-dogs (*Gad-flies*) were troublesome these birds would sit on the horses' backs and pick them off. Often one would take up its position on the horse's rump and catch every fly that dared approach. At night they would sometimes sit in the grass, on the carts, or even perch on the horses, if no bushes were in the vicinity.

No birds, to-day, are such nuisances in the North-West as the various species of Blackbirds. These birds, in many parts of Manitoba, are a heavy tax at present on farmers, but as settlements increase, their power to injure will decrease, as they will have more fields to attack and possibly be fewer in number. Meadow Larks and Bob-o-Links are very beautiful birds, and are found on almost every part of the prairie. The Magpie is very common to the west of the Touchwood Hills, but seems never to come east of the Assiniboine River, at Fort Ellice. The Whiskey Jack or Canada Jay is the first to greet the lonely traveller, when he stops for the night in any part of the forest, and in the morning, it salutes him with the first streak of dawn, and bids him good-bye when he leaves. The Cow-bird, the Whiskey Jack, and the Indian are all alike sociable, and wherever the white man stops, there these congregate—for food.

The next sub-order is the *Clamatores*, or Flycatchers. They are represented by one Family, five Genera, and eight Species enumerated below :—

Kingbird,
Arkansas Fly-catcher,
Say's Fly-catcher,
Phebe Bird,

Tyrannus Carolinensis, Term.
" *verticibis*, Say.
Sayornis Sayus, Baird.
" *fuscus*, Baird.

Olive-sided Fly-catcher,
Western Wood Pewee,
Traill's Fly-catcher,
Least Fly-catcher,

Conotopus borealis, Baird.
" *Richardsoni*, Baird.
Empidonax Traillii, Baird.
" *minimus*, Baird.

The Kingbird is common throughout the territory, and well deserves his name of "tyrant," as he guards carefully his own domain, and chases away every bird that would injure either his mate or her young. On and around the Cypress Hills, the Arkansas Fly-catcher is quite common, but seems to extend no farther north. The Least Fly-catcher is very abundant in the damp northern forest, and often in a tall tree is indistinguishable from the Red-Eyed Vireo, which, however, is a much larger bird.

Order II. *Picariæ*.

This order has few representatives in the North-West, but they are interesting though few. In our limits, it is represented by six Families, eleven Genera, and fourteen Species, as follows:—

Whip-poor-Will,
Night Hawk,
Chimney Swift,
Humming Bird,
Kingfisher,
Black-billed Cuckoo,
Pileated Woodpecker
Hairy Woodpecker,
Downy Woodpecker,
Three-toed Woodpecker,
Banded Three-toed Woodpecker,
Yellow-billed Woodpecker,
Brown-headed Woodpecker,
High-holder,

Antrostomus vociferus, Bon.
Chordeiles Virginianus, Bon.
Chaetura pelagica, Baird.
Trochilus colubris, L.
Ceryle Alcyon, Bon.
Coccygus erythrophthalmus, Bon.
Hylotomus pileatus, Baird.
Picus villosus, L.
" *pubescens*, L.
Picoides arcticus, Gray.
" *Americanus*, Breh.
Sphyrapicus varius, Baird.
" *thyroideus*, Baird.
Colaptes auratus, Swains.

All of these are birds of the thicket or forest, though they may be seen on the prairie when in pursuit of food. I have noticed the Humming bird as far north as lat. 59°, in the vicinity of Lake Athabasca. Sir John Richardson places its northern limit in lat. 57°. All the Wood-peckers, as their name indicates, live in the woods. None were observed in the south, except the Hairy Wood-pecker and High-holder, which were met with on the Cypress Hills.

Order III. *Raptores.*

Numerous species of this order have their homes on the plains or in the forests, and live on mice, moles, frogs, and birds. It is principally represented by the two Families the *Strigidae* or Owls, and the *Falconidae* or Hawks. Of the three Families, we have eighteen Genera and twenty-four Species which are as below :—

Great Horned Owl,	<i>Bubo Virginianus</i> , Bon.
Arctic Owl,	" <i>arcticus</i> , Swains.
Screech Owl,	<i>Scops asio</i> , Bon.
Long-eared Owl,	<i>Otus Wilsonianus</i> , Less
Short-eared Owl,	<i>Brachyotus palustris</i> , Gould.
Great Grey Owl,	<i>Syrnium cinereum</i> , Aud.
Great White or Snowy Owl,	<i>Nyctea Scandiaca</i> , Newt.
Hawk Owl,	<i>Surnia ulula</i> , Bon
Richardson's Owl,	<i>Nyctale Richardsoni</i> , Bon
Marsh Harrier,	<i>Circus Hudsonius</i> , Vieill
Sharp-shinned Hawk,	<i>Accipiter fuscus</i> , Gray
Gos Hawk,	<i>Astur atricapillus</i> , Jar.
Peregrine Falcon,	<i>Falco anatum</i> , Bon
Pigeon Hawk,	" <i>columbarius</i> , L.
American Merlin,	" <i>Richardsoni</i> , Ridg
Sparrow Hawk,	" <i>sparverius</i> , L.
Red-tailed Hawk,	<i>Buteo borealis</i> , Gond.
Swainson's Buzzard,	" <i>Swainsoni</i> , Bon.
Rough-legged Hawk,	<i>Archibuteo Sancti-Johannis</i> , Gond.
Californian Squirrel Hawk,	" <i>ferrugineus</i> , Gray
Fish Hawk, Osprey,	<i>Pandion haliaetus</i> , Cab.
Golden Eagle,	<i>Aquila chrysaetus</i> , L.
Bald Eagle,	<i>Haliaetus leucocephalus</i> , Sav.
Turkey Buzzard,	<i>Cathartes aura</i> , Ill.

The only Owl observed on the plains is the Marsh Owl, which has been noticed to make many short flights by day. All the other Owls are found in the thickets or forests bordering the great plains. Four species of the smaller falcons are found in the river bottoms throughout the prairie. Owing to the different color of the plumage at various ages, they are hard to distinguish, except by comparing a large number of skins. These hawks are all very beautiful, but the Sparrow Hawk in full or adult plumage is the most beautiful.

No hawk is more abundant than the Marsh Harrier, which is constantly on the move, gliding over the marshes or the prairie, looking for mice or small birds. Swainson's Hawks are generally seen following each other in quick succession along the top of the high bluffs which shut in a river valley. Or, at another time, they may be seen sitting on the very edge of a "cut bank," gazing down into the valley, or perched on the top of a knoll, watching the train as it moves past. Eagles are seldom seen away from the mountains or the rocky shores of the interior lakes. It is seldom that the Turkey Buzzard is seen, except in the spring, when it comes to finish what the Raven has left of the winter's dead.

Order IV. *Columbidæ*.

This order is represented by only one species, the Wild Pigeon (*Ectopistes migratoria*) of Swains. Few pigeons are seen on the plains, but in the latter part of August and the first half of September, they are abundant in the northern river valleys, feeding on the berries of the Wild Cornel (*Cornus stolonifera*).

Order V. *Gallinæ*.

The Gallinaceous birds, though few in number as regards species, are of great value on account of their size. All being winter residents, they furnish many a meal to the starving Indian or other wanderer, when other game is not to be had. In the following enumeration I include all the species of Ptarmigan, although some of them live most of the time very far north:—

Spruce Partridge,
Franklin's Grouse,
Blue or Dusky Grouse,
Black-tailed Grouse,
Sage Cock,
Sharp-tailed Grouse,
Prairie Hen,
"Partridge,"
Grey-ruffed Grouse,

Tetrao Canadensis, L.
" *Franklini*, Dougl.
" *obscurus*, Say
" *Richardsoni*, Coues.
Centrocercus urophasianus, L.
Pediceetes phasianellus, Eli
Cupidonia cupido, Baird.
Bonasa umbellus, Steph
" *umbelloides*, Dougl.

White Tailed Ptarmigan,
White Ptarmigan,
Rock Grouse,

Lagopus leucurus, Swains.
" *albus*, Aud.
" *rupestris*, Leach.

Of the above twelve species all belong to the forest, except three: Sage Cock, Prairie Hen, and Sharp-tailed Grouse or "Prairie Chicken." The two first are only found along a part of the southern boundary, so that the Prairie Chicken is really the only Gallinaceous bird found on the prairie. In the woods and thickets we have the Partridge or Ruffed Grouse, and the Spruce Partridge. These birds are very numerous in the poplar woods to the north of Fort Pelly. During the past season, while they were feeding on the black currants which abounded in the low woods, I shot large numbers of them, and supplied ourselves with fresh provisions when our stock was running low. All the other species, except the last two, which have their home to the north, are natives of the rocky mountains. The Black-tailed Grouse is a fine large bird, and frequents the timber on the higher slopes of the mountains.

Order VI. *Grallatores*, or *Waders*.

This order is represented by three sub-orders, and numerous species. For the sake of brevity, I shall give the species of the three in succession, and only introduce those in this and the succeeding orders which, at some time of the year, are found on the great prairie or the forests along its border:—

I. Sub-Order. *Limicolæ*. (Vieill)

Black-billed Plover,
Golden Plover,
Kill-deer Plover,
Semipalmated Plover,
Piping Plover,
American Avocet,
Wilson's Phalarope,
Northern Phalarope,
American Snipe,
Red-breasted Snipe,
Stilt Sandpiper,

Squatarola Helvetica, Vieill.
Charadrius marmoratus, Wag
Aegialitis vocifera, Bon
" *semipalmatus*, Cab
" *melodia*, Coues.
Recurvirostra Americana, Gm.
Sieganopsis Wilsoni, Coues.
Lobipes hyperboreus, Cuv.
Gallinago Wilsoni, Bon.
Macrorhamphus griseus, Leach.
Micropalama himantopus, Bd.

Semipalmated Sandpiper,
 Least Sandpiper,
 Baird's Sandpiper,
 Jack Snipe,
 White-rumped Sandpiper,
 Sanderling,
 Great Marbled Godwit,
 Black-tailed Godwit,
 Semipalmated Tattler,
 Greater Yellow Shanks,
 Lesser Yellow Shanks,
 Solitary Tattler,
 Spotted Sandpiper,
 Prairie Plover,
 Long-billed Curlew,
 Hudsonian Curlew,
 Esquimaux Curlew,

Freunetes pusillus, Cass.
Tringa minutilla, Vieill.
 " *Bairdii*, Coues.
 " *maculata*, Vieill.
 " *fuscollis*, Vieill.
Calidris arenaria, Ill.
Limosa fedoa, Ord.
 " *Hudsonica*, Swains.
Totanus semipalmatus, T.
 " *melanoleucus*, Vieill.
 " *flavipes*, Vieill.
 " *solitarius*, An.I.
Tringoides macularius, Gray.
Actiturus Bartramius, Bon.
Numenius longirostris, Wils.
 " *Hudsonicus*, Lath.
 " *borealis*, Lath.

II. Sub-Order. Herodiones.

Great Blue Heron,
 Green Heron,
 Bittern,

Ardea herodias, L.
 " *virescens*, L.
Botaurus minor, Bois.

III. Sub-Order. Alectorides.

White or Whooping Crane,
 Sandhill or Brown Crane,
 Virginia Rail,
 Carolina Rail,
 Coot. Mud Hen,

Grus Americana, Tem.
Grus Canadensis, Tem.
Rallus Virginianus, L.
Porzana Carolina, Cab.
Fulica Americana, Gms.

The Plover first come to our notice. Late or early in September, the Golden Plover descend to the plains, and here they may be seen in large flocks, feeding on the open prairie or along the borders of a marsh. Killdeer and Semipalmated Plover breed in the country, and can be shot at any time. On the borders of brackish ponds or wading in the shallow water, the beautiful Avocet and Great Marbled Godwit may be found all summer. Around every pond and on every saline marsh are various species of Sandpiper and Snipe. As the month of August draws to a close, these appear in countless numbers and fill the air with their various calls, and a sportsman, if no better game were near, would consider himself in paradise.

Bitterns are very common in the grass marshes at all seasons. The Great Blue Heron frequents river margins, and often surprises the belated voyager when seen standing on the upper limbs of a dead tree, peering down at him as he silently glides underneath. Cranes are seldom seen in flocks, except in September, when they congregate prior to their southern flight. They are always the first to migrate, and long lines of them will be seen high up moving southward in the latter part of September.

Order VII. *Lamellirostres*.

Trumpeter Swan,
Whistling Swan,
Snow Goose. Wavy,
Canada Goose,
Mallard or Stock Duck,
Pintall Duck,
Gadwell. Grey Duck,
American Widgeon,
Green Winged Teal,
Blue Winged Teal,
Cinnamon Teal,
Shoveller. Spoon Bill,
Wood Duck,
Blue Bill, Broad Bill,
Little Black Head,
Ring Necked Duck,
Red Head,
Canvass-back Duck,
Golden Eye,
Barrow's Golden Eye,
Buffle-head, Spirit Duck,
American Scoter,
Ruddy Duck,
Merganser, Sheldrake,
Red Breasted Merganser,
Hooded Merganser,

Cygnus buccinator, Rich.
" *Americanus*, Sharp.
Anser hyperboreus, Pall.
Branta Canadensis, Gray.
Anas boschas, L.
Dafila acuta, L.
Chauleasmus streperus, Gray.
Mereca Americana, Steph.
Querquedula Carolinensis, St.
" *discors*, Steph.
" *cyanopectera*, Cass.
Spatula clypeata, Boie.
Aix sponsa, Boie.
Fuligula marila, Steph.
" *affinis*, Eyton.
" *collaris*, Bon.
" *ferina*, Bon.
" *vallisneria*, Steph.
Bucephala clangula, Coues.
" *Islandica*, Baird.
" *albeola*, Baird.
Anas nigra, Wilson.
Erismatura rubida, Bon.
Mergus Merganser, L.
" *serrator*, L.
" *cucullatus*, L.

In the foregoing list, I have included no species which I have not seen in the North-West, and have no doubt but that many of the "Sea Ducks," not enumerated here, will be shot by others. Both the Swans and the Wavy breed in the north, and are only seen in the migrations. The

Canada Goose still breeds around the larger lakes, and on islands in them. So late as June, 1879, I have seen the Canada Goose and a flock of young ones on the Assiniboine where the town of Brandon now stands, and at present they still breed on the river, above Fort Ellice.

Of all the prairie ducks none is more plentiful than the Mallard. This species is always found in the grass marshes, and during the month of September, their loud "*quack-quack*" is heard continually rising from them. It is true sport to obtain them, as they always lie close amongst the grass and have to be taken on the wing. I have never noticed the Black Duck in any part of the North-West, nor do I know that others have. Teal are in great numbers, and these with the Spoon-bill make up the greater part of the ducks, south of the Touchwood Hills, prior to the migrations. It is scarcely credible the myriads of ducks that fill every pond and marsh in September and October, and no description could give an adequate picture of the astonishing sight. On the margin of a pond, the Tattlers are running backwards and forwards, making all manner of discordant noises. Killdeer Plover, Ring-necked Plover, and eight or ten species of Sandpipers are just as busy. Red-breasted Snipe are in hundreds, and very busy thrusting their long bills into the mud. Outside the line of waders are the Spoonbills and Teal, and still farther out, the Widgeon and Butter Ball, but we want none of these—they are too small and not worth shooting for food. Behind a tuft of sedges, we hear the "*Quack*" of the Mallard, and we still lie close though sorely tempted. Sailing majestically from behind the sedge, comes a fine drake, followed by three ducks. They are in line, and a good shot will fetch them all. Aiming at their heads, the gun is fired, and with loud cries all the life of the pond rises with a roar like thunder, and darkens the air with their numbers. Four ducks, each larger than a very fine tame duck, are struggling in the

pond, they are picked up, and a supper for six is soon in the little camp behind the ridge.

The Mergansers, or, as we call them, "Saw-bills," are river ducks, and often during the month of August, will keep before a boat for days, as it passes up or down a river. They are beautiful ducks but poor food, except men are on short allowance, when they are considered valuable. By their aid, I was enabled, last summer, to accomplish my work when food grew scarce, and it was only when full supplies of food were obtained that we discovered they were *fishy*.

Order VIII. *Steganopodes*.

White Pelican,
Double-crested Cormorant,

Pelecanus trachyrhynchus. Lath.
Graculus dilophus. Gray.

Pelicans are numerous on Long Lake, Old Wives Lakes, and Gull Lake, north of Cypress Hills. These are their breeding places on the plains. They are very abundant, as well as the Cormorants on Lake Winnipegosis, and doubtless many of the large northern lakes. On many of the rivers are Pelican Rapids, because here, they sit on the boulders, watching for the fish which are ascending the rapids. In 1875, when ascending Beaver River, we came to the Pelican Rapids on that river. Numerous Pelicans were sitting on the large boulders in mid stream, and all but one flew at our approach. At first, I was amused at the contortions this one was making, but it was only when the bow Indian seized a pole, and the others put all their energy in the paddle, that I realized that the bird could not rise. When we were almost within striking distance he made a greater effort than before, heaved his load of fish into the river, and sailed away. We only remembered the guns when the shooting was out of our power. Lying beside me, as I write, is a Pelican's pouch, sixteen inches long and nine inches deep, so it can easily be seen that they have space for a considerable load.

Order IX. *Longipennes.*

Herring Gull,	<i>Larus argentatus</i> , Brinn.
Ring-billed Gull,	" <i>Delawarensis</i> , Ord.
American Mew Gull,	" <i>brachyrhynchus</i> , Rich.
Franklin's Rosy Gull,	" <i>Franklini</i> , Rich.
Bonaparte's Gull,	" <i>Philadelphia</i> , Gray.
Forster's Tern,	<i>Sterna Forsteri</i> , Nutt.
Common Tern,	" <i>Hirundo</i> , Auct.
Black Tern,	<i>Hydrochelidon lariformis</i> , Coues.
White-Winged Black Tern,	" <i>nigra</i> , Gray.

All the gulls and terns, except the last one, are abundant on Lakes Manitoba and Winnipegosis. On the lakes of the prairie, Franklin's Gull, Bonaparte's Gull, and the Ring-billed Gull are quite common. As they vary much in immature states, an amateur may be led to believe he has many species when he has only three. The Black Tern is very common in all marshy tracts on the prairie, and seems more like a large species of Swallow than a Tern. On a small lake, at the head of Swan River, a few of the White-Winged Black Tern were observed, and one was shot. This is an extremely rare bird. Forster's and the Common Tern are very plentiful on the larger lakes in the forest country, and enliven many a sand bar and group of bare rocks heaped up by ice in the shallow of a northern lake.

Order X. *Pygopodes.*

Great Northern Diver, Loon,	<i>Colymbus torquatus</i> , Brinn.
Red Throated Diver,	" <i>septentrionalis</i> , L.
Western Grebe,	<i>Podiceps occidentalis</i> , Coues.
Crested Grebe,	" <i>cristatus</i> , Lath.
Red-necked Grebe,	" <i>rubricollis</i> , Bon.
Horned Grebe,	" <i>cornutus</i> , Lath.
American Eared Grebe,	" <i>auritus</i> , Nutt.
Dab-Chick,	<i>Podilymbus podiceps</i> , Lawr.

The two latter are quite common on the deep pools which are found on some parts of the prairie, and occasionally a loon may be seen in the larger bodies of water. On Water Hen River and Lake, the Western and Red-necked Grebe breed in great numbers. Their nests are built on the old

sedges, and rise and fall with the water. Here, the Indians collect large numbers of eggs in the proper season, and one old fellow, last season, astonished me by the remark that he could have fresh eggs all summer. On enquiry, I learned that he went regularly to the same nests, and never took all the eggs, so that he kept the poor bird laying all summer. The various species of Grebe, the Coot, and Bittern are all called Water Hens by Indians, but more especially the first mentioned. The Western Grebe is a very beautiful and graceful bird. Its length averages nearly thirty inches, including the bill which is very narrow and sharp-pointed. Underneath it is a pure glossy white, from the base of the bill to its other extremity. The upper part of the head and neck are sooty black, back and wing coverts greyish-black becoming lighter on the lower part of the back. This bird seems to be altogether unknown in the interior, and yet it has bred in thousands, at Water Hen River, from time immemorial. Up to the present, it has only been known from the Pacific Coast.

I place the whole series of birds in the following table, merely giving, however, the Orders, Families, Genera, and Species:—

Synoptical Table.

ORDER.	FAMILY.	GENERA.	SPECIES.
Passerces.....	Turdidæ.....	3	7
".....	Saxicolidæ.....	1	1
".....	Cinclidæ.....	1	1
".....	Sylviidæ.....	1	1
".....	Paridæ.....	1	2
".....	Troglodytidæ.....	3	3
".....	Alaudidæ.....	1	1
".....	Motacillidæ.....	2	2
".....	Sylvicolidæ.....	7	17
".....	Hirundinidæ.....	5	5
".....	Ampelidæ.....	1	2
".....	Vireonidæ.....	1	2
".....	Laniidæ.....	1	2
".....	Fringillidæ.....	20	33
".....	Icteridæ.....	8	10
".....	Corvidæ.....	5	6
".....	Tyrannidæ.....	4	8

ORDER.	FAMILY.	GENERA.	SPECIES.
Picariæ	Cypselidæ	1	1
"	Caprimulgidæ	2	2
"	Trochilidæ	1	1
"	Alcedinidæ	1	1
"	Cuculidæ	1	1
"	Picidæ	5	8
Raptoreæ	Strigidæ	8	9
"	Falconidæ	9	14
"	Cathartidæ	1	1
Columbæ	Columbidæ	1	1
Gallinæ	Tetraonidæ	6	12
Grallatoreæ	Charadriidæ	3	5
"	Recurvirostridæ	1	1
"	Phalaropodidæ	2	2
"	Scelopacidæ	11	20
"	Ardeidæ	2	3
"	Gruvidæ	1	2
"	Rallidæ	3	3
Lamellirostreæ	Anatidæ	14	26
Steganopodes	Pelecanidæ	1	1
"	Phalacrocoracidæ	1	1
Longipennes	Laridæ	3	9
Pygopodes	Colymbidæ	1	2
"	Podicipidæ	2	6

Recapitulation.

ORDERS.	FAMILIES.	GENERA.	SPECIES.
Passeres... 1	17	65	103
Picariæ... 1	6	11	14
Raptoreæ... 1	3	18	24
Columbæ... 1	1	1	1
Gallinæ... 1	1	6	12
Grallatoreæ... 1	7	22	36
Lamellirostreæ... 1	1	14	26
Steganopodes... 1	2	2	2
Longipennes... 1	1	3	9
Pygopodes... 1	2	3	8
	10	41	235

I have been careful to introduce no species into the foregoing catalogue of which I had not seen specimens east of the Rocky Mountains and west of Winnipeg. When a better knowledge is obtained of the country a few species will be added, so that we may say the Avi-fauna of the territory, leaving out the Arctic birds, is about 250 species. The few notes appended will be read with interest by many parties settling in the country, as they were written on the ground.

While encamped at Grand Valley (now Brandon) on the Assiniboine, numerous birds, common in Ontario, were observed, such as Meadow Larks, Robins, Blackbirds, Cow Birds, Bob-o-links, Bitterns, and numerous finches, which were breeding either on the prairie or in the bush along the river. On the prairie the Kill Deer Plover was noticed, and on the drier upland the "Prairie Plover" or Bartram's Tattler was occasionally seen. Farther west these birds were quite common, the latter on the prairie and the former along the lakes or ponds throughout the country. One evening in July we pitched our camp close to the nest of a Kill Deer Plover, at this time one little bird being hatched out and the other emerging from the shell. In our presence she assisted the chick out of the shell, and as soon as both were able to stand she coaxed them away from the nest, and before dark had them safely hidden away in the sedges bordering the pond from which we obtained our water.

On the sand hills at Flat Creek two fine specimens of the Long Billed Curlew were obtained. One or two others were shot near the Cypress Hills, but it was a very rare bird and seldom seen. In the marshes east of Moose Mountain both the Sand Hill Crane and the White Crane were breeding, together with the Phalaropes. These beautiful and interesting birds were quite numerous near Moose Mountain. The Shoveller or Spoonbill Duck, the American Widgeon, the Green Winged Teal, the Blue Winged Teal, and the Mallard were breeding in or near the marshes, and their eggs were occasionally obtained. Skimming over these eastern marshes, and occasionally darting down to the surface, was the beautiful Black Tern.

On the great plain west of Moose Mountain few birds were met with, but on the eastern side flocks of the Yellow Headed Blackbirds were seen around ponds, and on the western part near Moose Jaw Creek, the rare and interesting White Winged Blackbird was met with. The common-

est bird on this prairie was the Chestnut Collared Bunting, although never recognized after this.

In the vicinity of the Coteau we reached a few salt water ponds, and here obtained numerous specimens of the beautiful Avocet, which were very plentiful around all the salt lakes on the western plains, and so fearless that we had no difficulty in shooting all the specimens we desired. On the same pools were the Marbled Godwit and the Willet or Stone Snipe, both large and beautiful birds. Numerous sandpipers and many of the smaller snipe were abundant, and during the months of August and September could have been shot by the hundred as they waded or swam in the various pools or lakes we passed.

After the middle of August we began to shoot ducks, and besides the species mentioned above, the Gadwell or Grey Duck and Red-breasted Merganser bred in numbers on the plains. Coots or Mud Hens and Pied Billed Grebe were in great numbers, and afforded fine sport, as we had to wade almost up to our neck to obtain our specimens, as they were very difficult to kill owing to their diving power.

After the middle of September the sea ducks began to arrive, and it is no figure of speech to say that the ponds and lakelets were alive with them. For the following six weeks feathered game of every kind were so abundant that any person in a week could have shot enough ducks and geese to have lasted a family all winter. The abundance of water fowl in the interior is of such importance at this time when Indians are being fed by the Government, that they should be compelled to lay in a stock of food for themselves during the winter. To see hunters perishing of hunger, or living on supplies furnished by the Government, and at the same time surrounded by millions of birds is, a paradox; but these men carry rifles, and bird shooting to them is a small business after buffalo hunting. Within a day's journey of the Cree Reserve on the north side of the Cypress Hills, is

a large lake named by me Gull Lake, which during the last days of August was literally alive with birds, and when one shot was enough to supply six of us with a dinner, yet these Indians were largely depending on the Government rations at this time, and Colonel McDonald could scarcely persuade some young men to go and kill a few ducks by liberal offers of powder and shot. At the Assiniboine Reserve it was just the same, plenty of birds in the neighborhood but scarcely any attempt made to shoot them, as the men preferred Government rations to independence. Rifles to-day are of little value to the plain Indians, and they should be required to exchange these for shot guns at an early day.

Geese, ducks, and prairie chickens are taking to the stubble fields in the fall, so that no difficulty will be found by incoming settlers to lay up a supply of fat fowl for the winter. About forty species of game birds were either shot or seen on the prairie, and it is very probable that many species were not observed as we were far east of the main migrating lines. All birds shot were fat, and soup made from the various species of snipe and plover was considered a great dainty. The value of the bird crop after the railroad is built will be enormous, but the destruction of eggs in the spring by Indians must cease. None but those who reside in the interior or have been there in the autumn can realize the number of birds living there or passing through at that season.

Hawks were numerous, and various species were shot both on the prairie and in the river valleys. The sparrow hawk was always found in the vicinity of wood, and frequented all the stream valleys throughout the country. Along the prairie and over ponds and marshes the Marsh Harrier was constantly gliding, and frequently paid the death penalty for his inquisitiveness. Many fine specimens of Swainson's Hawk were shot, and it was only by obtaining the skins that we were able to decide on the species, owing to the

dark color of the plumage. This hawk delighted to sail close along the top of the cliffs bordering a stream, and pick up any living thing observed. Occasional specimens of the Rough Legged Hawk were obtained, but it was very wary, and always soared at a great height. Other species were in more or less abundance, and one young specimen of the Bald Headed Eagle was obtained where it was evidently catching snakes at the margin of a lake.

Owls were not common on the prairie, and only one species the Short Eared or Marsh Owl, was seen with any degree of frequency. Along the margin of the woods the Greater Horned Owl and the Lesser Horned Owl were occasionally noticed but were apparently rare.

Of the Gull family many fine specimens were obtained at some of the larger lakes. On the 28th August five species were shot on Gull Lake, a large sheet of water north of the Cypress Hills. Franklin's Rosy Gull was secured in fine plumage, and many of the others in various states and different ages, so that in twenty specimens one would be led to believe there were at least ten species.

CHAPTER XXII.

Notes on Reptiles, Fishes, and Insects.

List of Reptiles—Snakes in Spring and Autumn—Gathering of Snakes at Livingstone—Snakes in Bullrush Lake—Fishing for Siredons—Rattlesnakes—Lizards—Toads and Frogs—List of Fishes—The Perches—The "Doro"—Carp Family—The Great Numbers—Not Considered Good Food—Dried for Dogs and Bait—The Pike or Jack Fish—Its Habits—The Cat Fish—Salmon Family—Arctic Salmon—Mountain Trout—Arctic Trout—Anecdotes—Bow River Trout—White Fish—Their great Value—White Fish in the Prairio Region—In the Forest Region—West of the Mountains—The little White Fish or Herring—The Gold-eye—Fishing for Gold-eyes in the Rivers of the Prairie—Western Pickerel—Its Value—The Loche or Burbot—The Sturgeon—Fish Supply of the Saskatchewan Valley and Prairie Country—Qu'Appelle and Long Lake Fisheries—Notes on Insects—Butterflies of the Prairie—Myriads in June—Absence of Moths—Coleoptera or Beetles—Grasshoppers and their Allies—Grasshopper Plague—Its Causes and Prevention—Conclusion.

REPTILES are far from numerous in the North-West, yet wonderful stories are told of the immense numbers of Garter Snakes (*Eutænia sirtalis*) in some localities. At Stony Mountain, sixteen miles from Winnipeg, they are seen in myriads in early spring and in September. During these periods they lie in the sun and coil into terrible looking objects, but are perfectly harmless.

Last autumn they were gathering for their winter sleep when I was at Livingstone (Swan River Barracks), and as they were said to be numerous I went to see them. All accounts I had ever read fell far short of the reality. They were congregated in and around three basin shaped hollows, which were partly filled with very large boulders, and bordered by a few clumps of bushes. The grass for rods around was filled with them, and the stones completely covered. As we approached, a hiss that caused a shudder to pass through me, greeted us from all sides. A few hurried steps and Inspector Griesbach, of the Mounted Police and I, stood on the great boulder, in the centre.

of the hollow, from which the snakes slid as we took possession. As soon as my excited nerves allowed me to look intelligently around, I saw a sight never to be forgotten. Coiled on every bush and forming cables from the size of a hawser up to writhing masses three feet in diameter, were snakes from one to five feet in length. Around the hollow, but more particularly on the sunny side, they lay in great heaps, so closely packed together that nothing but heads could be seen. It was terrible to look upon the glittering eyes that were fixed upon us by thousands, and see the forked tongues thrust out and withdrawn as the perpetual hiss unceasingly fell upon our ears. After a few minutes we became more accustomed to each other's society, and now instead of being disgusted with the writhing masses, we saw beauty in every fold. The rays of the western sun falling on their bodies at every angle, caused a mingling of color that none but a master pen could depict.

At Bullrush Lake, on the prairie west of Old Wives Lakes, during the month of July, Bald Headed Eagles and Rough Legged Hawks were feasting on snakes. The snakes were catching their food in the lake. I cut one open and discovered the remains of an animal like a lizard. Having abundance of fishing lines with us, we set some lines baited with pork, and next morning hauled out a strange looking animal. Having seen the Menobranchus (*Necturus lateralis*) of the Great Lakes, I took this animal to be a species of Siredon, possibly *Siredon lichenodes*, which has been obtained south of the boundary. The specimen looked very much like an overgrown lizard, but the prominent gills showed it to be a denizen of the water. It is extremely probable that many, if not all the Lizard Lakes in the North-West, get their names from this animal.

Between the Forks of the Bow and Red Deer Rivers, a species of rattle snake is said to find a home, but I have never seen it.

I have heard many stories about the number of lizards in certain localities, but must confess to a disbelief in the number. While passing through the Touchwood Hills with Half-breeds, I have always heard of multitudes of lizards, but never saw one. During the many summers I have spent on the prairies, I have observed not more than half a dozen, and these were very small, seldom attaining a length of six inches. Archbishop Taché, in his work on the North-West, speaking of lizards, says:—

“Our lizards are of two species—one, rather larger than the other, is marked with green; the other is altogether grey. These animals are very harmless, and are chiefly found in the centre of the prairie region. They are most numerous in the small lakes, and in the neighborhood of the Touchwood Hills. Their only unpleasant points are their appearance, and desire to approach travellers. When camping, at certain seasons of the year, it is necessary to surround one's tent with a small ditch, of which the inner side is cut vertically, as these lizards climb up only gentle slopes. Unless this precaution is taken, they come into the tents in every direction; and there are many who would dislike to be either awake, or asleep, on a bed covered with lizards.”

Toads and frogs are abundant, especially the latter. It is probable that there are at least half a dozen species of small frogs on the southern prairies. Many of them are very beautiful, and their bright colors were much admired as we marched across the monotonous plains of the south. A large frog was seldom seen, except in the woods or along the rivers of the plains.

The only troublesome animal met with is the leach, which infests all running streams and most of the lakes. They are of two species,—one from three to four inches, the other quite small. While wading around in the ponds, collecting aquatic plants, my legs have often been covered

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with the smaller species, but these were easily taken off by scraping with a knife. Last season, when ascending Red Deer River, the men were much troubled with the larger species, which infested the mud and other debris found in the river bed. Usually, the men wore old shoes, without socks, and the leeches would get into the shoes, and then attach themselves to the ankles or feet. Often they crawled between the toes, and caused great inconvenience, as it was extremely difficult to get them off. When taken off, the blood would flow freely for some time, but no ill effects followed.

In the enumeration of the fishes, I shall be as accurate as possible, where no authorities on the subject are attainable, Richardson's work being so rare, that it is practically beyond my reach. The value of the fishes of the northern rivers and lakes is so little known to the world, that some of the statements regarding their numbers may be looked upon with suspicion.

CATALOGUE OF WESTERN FISHES.

Order. Teleostei. (The Typical Fishes.)

I. Sub-Order. Acanthopteri. (The Spiny-rayed Fishes.)

Family I. Percide. (The Perches.)

1. *Perca Americana*, Schrank. (Common Yellow Perch.)
2. *Stizostedion vitreum*, Jorden & Copeland. (Wall-eyed Pike, Dory Pickerel.)

Family II. Centrarchide. (The Sun Fishes.)

3. *Eupomotis*, Gill & Jordon. (Common Sun Fish.)

Family III. Scieenide. (The Maigres.)

4. *Haplodonotus grunniens*, Raf. (Bubblers, Drum, White Perch.)

Family IV. Cottide. (The Sculpins.)

5. *Cottus cognatus*, Rich. (Northern Sculpin.)

II. Sub-Order. Anacanthini. (The Jugular Fishes.)

Family V. Gadide. (The Cod Fishes.)

6. *Lota maculosus*, Less. (Mothy Burbot.)
7. " *compressa*, Less. (Ling or Eel-Pout.)

*III. Sub-Order. Hemibranchi. (The Half-Gilled Fishes.)**Family VI. Gasterosteidae. (The Sticklebacks.)*

8. *Gasterosteus concinnus*, Rich. (The Stickleback.)

*IV. Sub-Order. Haplomi. (The Toothed Minnows.)**Family VII. Esocidae. (The Pikes.)*

9. *Esox nobilior*, Thomp. (Muskallunge.)
10. " *lucius*, Linn. (Pike or Jack-Fish.)

*V. Sub-Order. Isospondyli. (The Trout-like Fishes.)**Family VIII. Salmonidae. (The Trout.)*

11. *Salmo salar*, L. (Great Sea Salmon.)
12. " *quinnat*, Rich. (The Columbia River Salmon.)
13. " *Seouleri*, Rich. (The Ekowan or British Columbia Salmon.)
14. " *Rossii*, Rich. (Ross's Arctic Salmon.)
15. " *Hearnii*, Rich. (Coppermine River Salmon.)
16. " *namaycush*, Block. (Great Lake Trout.)
17. " *siscowet*, Agassiz. (Lake Superior Trout.)
18. " *Mackenzii*, Rich. (The Inconnu.)
19. " *Lewisii*, Grd. (Large Rocky Mountain Trout.)
20. " *tsuppitch*, Rich. (Western Salmon Trout.)
21. " *Gairdneri*, Rich. (Columbia River Trout.)
22. " *Clarkii*, Rich. (Clark's Western Trout.)
23. " *fontinalis*, Mitchell. (Common Brook Trout.)
24. " *stellatus*, Grd. (Rocky Mountain Brook Trout.)
25. " *Hoodii*, Rich. (Hood's Northern Trout.)
26. *Thymallus signifer*, Rich. (Bach's Grayling.)
27. " *thymalloides*, Rich. (Lesser Grayling.)
28. *Coregonus albus*, Le Seur. (White Fish.)
29. " *Couesii*, Milner. (Chief Mountain White Fish.)
30. " *quadrilateralis*, Rich. (Round Fish.)
31. " *lucidus*, Rich. (Bear Lake White Fish.)
32. " *artedi*, Le Seur. (Lake Herring.)

Family IX. Hyodontidae. (The Moon Eyes.)

33. *Hyodon chrysopsis*, Rich. (Golden Eye.)
34. " *tergisus*, Le Seur. (Silver Bass. Moon Eye)

*VI. Sub-Order. Eventognathi. (The Carp-like Fishes.)**Family X. Cyprinidae. (The Minnows.)*

35. *Luxilus cornutus*, Jordon. (Common Shiner.)
36. *Nocomis biguttatus*, Kirt. (Horned Chub.)

Family XI. Catostomidae. (The Suckers.)

37. *Catostomus longirostrum*, Le Seur. (Red Sucking Carp.)
38. " *Forsterianus*, Agas. (Grey Sucking Carp.)
39. " *Sueurii*, Rich. (Le Seur's Carp.)

*Order. Nematognathi. (The Sheat Fishes.)**Family XII. Siluride.*

40. *Silurus borealis*, Rich. (Large Cat-Fish.)

*Order. Chondrostei. (The Cartilaginous Ganoids.)**Family XIII. Acipenseride. (The Sturgeons.)*

41. *Acipenser rubicundus*, Le Sueur. (Lake Sturgeon.)
42. " *Rupertianus*, Rich. (Western Sturgeon.)

In the preceding catalogue I have enumerated only those species which I have been able to identify from the writings of various travellers and my own observations. The common Yellow Perch seems to be abundant in all the large lakes, but is seldom caught, as few fish with a hook and line, and the nets in use have too large meshes. I obtained this fish last summer in Lake Winnepagoosis, Swan Lake, and in small lakes at the head of Red Deer River.

The Pickerel stands next to the white fish as food and is much valued by the Indians who live on Lakes Winnipeg, Manitoba, and Winnepagoosis. During the summer the White Fish seems to retire into deep water, and at this season the Pickerel is taken in great numbers, either with the hook and line or by means of short nets set on the shallows or bars in the lakes. Last summer while exploring these lakes and Red Deer River, we scarcely ever failed to catch all the fish we wanted by setting our net on a shoal in the lake or across an eddy in the river.

The Ling or Burbot is common in all the lakes on both sides of the mountains, but is seldom if ever used for food. Sir John Richardson refers to this fish in the following words:—"The Methy Lake and Portage are named from the Cree designation of the Burbot (*Lota maculosa*--*La loche* of the Canadians), which abounds in these waters, and often supplies a poor and watery food to voyageurs whose provisions are exhausted. Though the fish is less prized than any other in the country, its roe is one of the best, and with a small addition of flour, makes a palatable and very

nourishing bread." Another writer says of it:—"Gorged with food or full of roe its naturally short body becomes inordinately enlarged; and its tail, very much like an eel, matches very badly with the thick body. The Methy has scales, but they are so small and so deeply imbedded in gelatinous epidermis that they can barely be distinguished in very many specimens. This fish is a cause of a great annoyance to fishermen in winter; it fixes itself with fishing lines in the most wonderful way, and entangles them most perfectly. When taken out of the water it alternately wriggles and straightens itself so as to make it a difficult task to unhook. Its smooth and sticky skin is so much colder than that of other inhabitants of the water, that the fisherman who shivers for hours together in the intensest cold on the lakes, is not very happy when he finds a Methy on the line he draws from under the ice. They are generally thrown away to feed crows; only the roe and liver are retained. At the posts in the interior, the roe is pounded and made into a kind of biscuit, to which whatever name strikes the fancy is given. The liver, which is rich and delicate, is also made into food, unless it becomes necessary to extract the oil for use in lamps, by which one can only half see, and which have, besides, anything but an agreeable smell."

While at Fort McLeod, in the northern part of British Columbia, in November, 1872, numbers of these fishes were caught in a large wicker basket placed in the stream. In almost every case, they were found with the small western white-fish in their mouth and stomach, the tail only being visible. It is possible that they gorged themselves when caught in the trap with the others.

Carp are taken in great numbers in every part of the North-West, but in all cases, they are looked upon as the next step to actual starvation. Wherever I have been, I have noticed that they are always selected for the dogs,

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and never eaten by the Indians or Half-breeds, except in cases of actual hunger. In the fall, these fish are dried by themselves, and kept for bait for Marten traps or for the dogs. Last year, we caught great numbers of the Red Finned Sucker, but after the first attempt at eating them, we always let them go again, as their flesh was far from being pleasant to the taste, after eating Pickerel and Jack-fish. All the streams are filled with them in spring, and some of the smaller brooks are apparently blocked with them.

Archbishop Taché, who has travelled so extensively in the west, thus writes of them:—"At the mention of Carp, the people of other countries figure to themselves a good and fine fish, but here the impression is quite of another character. When I first came into the country, I talked with *gusto*, about 'Soupe à la Carpe.' An old man, who had never tasted 'Soupe à la Carpe,' but who considered he had, in his time, eaten rather too much of the fish, could not agree with me, and said significantly: 'It is useless to talk about it; carp is but carp.' I did not at first understand the reason for his dislike; later, I had the opportunity and leisure to appreciate the correctness of his opinion. When one has but one kind of food to eat, when, for example, it is necessary to be satisfied with carp,—boiled, perhaps, in the water it was born in, without sauce or salt, or addition of any kind,—one quickly tires of the fish, and when this is frequently repeated, the simple name of the animal suffices to excite repulsion. The head of the carp is, beyond comparison, preferable to the body; but many heads would be required to satisfy an appetite excited by work and fatigue, and one soon tires of sucking these small bones. All the species abound in this country, and particularly the Red and Grey Suckers. This fish spawns in the month of June, and, several weeks previous, they are seen and killed in great numbers. When spawning is over,

particularly in shallows or stony river beds, they assemble in such numbers that their crowded dorsal fins, showing above the water, make it appear as if all the fish were artificially attached to one another, and they can then be killed with a stick. It is easy to understand that, in such circumstances as these, Indians cannot absolutely starve, but they invariably look upon the necessity for feeding on Carp as starvation. The vitality of the Carp is so great, that many true tales about it would be regarded as fabulous. A Carp may be frozen, thawed and then decapitated, and yet not die immediately; and they are seen to strike with their tails, and jump about for a long time after they have suffered such mutilation as would be apparently most likely to quiet them, and to cause immediate death."

Pike or Jack Fish are found in every river and small stream throughout the country, and although not particularly disliked by the Indians and Half-breeds, yet are considered only second rate food. When fresh caught and cooked until they are crisp, they are, in my opinion, excellent food. Last summer, we ate them almost every day, and relished them. No difficulty was experienced in catching them upon a hook baited with a small bit of pork. When in camp, at Fort Calgarry, in 1879, numbers were caught in Bow River by merely throwing the trawl into the river and drawing it out again. For a couple of days, we fed two families of Sarcies by means of one line, yet when we gave the line to them, they could not catch a fish. Small Pike, eight or ten inches long, were noticed in all the small brooks crossed on the plains, and in many marshes they were frequently observed amongst the grass.

It is a curious fact that certain fish are caught in nets at one time of the day, and other species are caught at other times, in the same place. During the six days I was in camp on Swan Lake, last summer, I paid particular attention to the fisheries. The Indians and Half-breeds had many

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nets set in the lake, which they examined night and morning. The nets were quite short, and set with one end towards the beach and the other towards the lake. Stakes were driven into the gravel, never in more than eight feet of water, and to these the nets were attached. Stones were employed for sinkers, and pieces of spruce for floats. Every evening, large numbers of Pike were found in the nets, but not another fish of any kind. In the morning, Gold Eyes, Carp, and occasionally White-fish were found, but no Pike. Seeing this occur day after day, I was led to watch the habits of the lake fish, and found that Pike, and the various species of Trout were day feeders, and retired to the depths at night, while the other fish came into the shallows at that time. By this, it would appear that carnivorous fish, unlike carnivorous mammals, feed in the day time, while the other and less voracious fish come out at night. If all fed at the same time, in a very few years the largest carnivorous species would utterly devour the smaller.

During certain seasons, great numbers of Pike are caught in Lake Winnipeg. Many have been taken which weighed over thirty pounds, but the usual weight is between six and ten pounds. They vary much in color, but those obtained in Peace River seemed to be exactly the same species as those drawn from the rivers of the plain. In the northern lakes they are particularly abundant, and from the number of lakes named after this fish, I am quite sure that it is the predominant species.

The Catfish is found in some abundance in the Saskatchewan, below the forks, but is not common in the upper part of the stream. It is quite common in Lake Winnipeg, and the smaller lakes connected with it, but is seldom caught except by lines set at night.

It is the Salmon Family, however, that are most highly valued by the natives of the interior. I am well aware that there are species in many of the lakes, which have never

been described. By casting the eye over any map of the country north of the prairie region, it will be seen that lakes are a very marked feature of the surface. Now, if it be understood that there is scarcely a lake throughout the vast interior, far north of the Arctic Circle, which does not teem with White-fish, a proximate idea may be formed of the vast food resources of the country. I have never seen a lake in the forest region that did not teem with magnificent fish, and of such excellent flavor that they are never distasteful to the appetite. In the valley of Qu'Appelle, are the four Fishing Lakes, Crooked Lake, and Round Lake, making in all a continuous lake over thirty miles long and nearly a mile wide, with water in many places over fifty feet deep. Long Lake, forty miles long, and averaging one and a half miles in width, may be said to be part of the same river. These seven lakes are filled with White-fish of the very best quality, and are taken, in the latter lake, in great numbers by the Touchwood Indians, every fall. In 1879, I picked up fish skeletons on the shores of Long Lake, that measured seven and three-fourths inches across the eyes, and nine and a half inches from the intersection of the neck to the end of the jaw.

At various times, I have seen multitudes caught in Lakes Manitoba, Winnipegosis, Little Slave Lake, Lake St. Ann's, Lac la Biche, Green Lake, Isle la Crosse Lake, Clear Water Lake, Buffalo Lake, Methy Lake, Lake Athabasca, and many other small lakes. I have seen Methy River so full of White-fish, that we killed them with common poles, and, finally, I may say I never heard of a lake, in the forest region, which do not contain them in myriads. Others have spoken of them in connection with their explorations, and these I will quote as confirmatory of my statements.

H. J. Cambie, C. E., when speaking of the fish at Little Slave Lake, says: "We were presented with a supply of White Fish, weighing from three to four pounds each, similar in

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every respect to those found in the great North American Lakes." At Moberly Lake, in lat. 46°, close to the Rocky Mountains he found the White Fish very abundant in September, 1879. They varied from four to six pounds each in weight, were very fat and seemed quite equal to the far-famed White Fish of Lake Huron.

Archbishop Taché, so often quoted, speaking of this fish says: "Without exception, it is incontestably the most palatable of all our fishes, and is the only one which is tolerable as a sole food. The Attihawmeg is found throughout the country; the lakes, large and small, are nearly all frequented by them, and they providentially swarm in some of the little lakes, otherwise, without this resource, many parts of the country would be uninhabitable. I am entitled to speak on the subject, for I have lived for whole years on White Fish as a principal food, and frequently the only one. It is not to be understood that living wholly upon one kind of food is not tiring, but this particular fish does not pall, nor does it excite the aversion generally caused by all other kinds.

"The White Fish generally weighs only three or four pounds; but they are occasionally caught weighing as much as fourteen pounds, and in this case their flesh would delight the most experienced judges of this kind of food. Without dressing or sauce of any kind, these fine fish are much superior to any I have tasted elsewhere, even when most artistically cooked. The White Fish spawns in autumn, and this is also the season for great fishing expeditions, although the fish is in its worst condition. The Attihawmeg, caught in autumn, are preserved in a very peculiar but simple manner: a frame work is set up, and on its top strong poles are laid three feet apart. Small rods, rather longer than the space intervening between the poles, are next prepared. As the fish are thrown on to the bank, a hole is cut through their tail-ends, and using this, ten are threaded on to each

rod, thus forming what is called a broche (a *spit*) the ends of which are placed on two of the poles. The fish, now hanging head downwards, have their throats cut with a slash of a knife, to free the blood, and to allow water to escape readily.

"The sharp nights at the end of October, assist to harden the fish, and to preserve them. When the season is not exceptionally warm, hung fish (*à la pente*) is excellent. Of course the flavor is injured by prolonged heat, and naturally it is only in autumn that this process can be adopted."

Sir John Richardson thus describes the mode of fishing practised by the Northern Indians:

"The nets, formed like those used in the herring fishery, measure, before mounting, one hundred and twenty yards in length, but are gathered in to eighty yards by the introduction of the backing-line along the upper edge. The depth of the net varies with that of the waters in which it is to be employed, from two to four yards. For the capture of White Fish, of the ordinary size of three or four pounds, the mesh is five and a half inches long, and where these fish are very large it is increased to six. For taking the Bear Lake herring, and the small *coregoni* of other localities, the meshes vary from two inches to two and three-quarters. In open waters the nets are short, as in the herring fishery; the upper margin being buoyed with cedar or fir floats, and the lower one depressed by stones. The fish hang themselves in the meshes, being unable, from the form of the gill-plates, to withdraw their heads after having once passed them through. Trout of 15 lbs. weight may be taken in the White Fish nets, and also *inconnu* (*Salmo mackenzii*) weighing 20 lbs.; but the meshes will not admit the heads of the larger trouts (*namay-cush*), which weigh from 30 to 50 lbs. These are caught with Cod-hooks.

"In winter the nets are set under the ice. The first step is to make a series of holes, about fifteen feet apart. A pole

is then introduced, and conducted along the surface of the water from hole to hole, carrying with it a line, which serves to haul in a string of nets, properly buoyed and loaded but seldom exceeding five in number. The rope is then detached, and each end of the net is fastened to a piece of wood, laid across its respective hole, or to a stake driven into the ice. On visiting the nets next day only the extreme holes are opened, the rope is attached anew at one end, and is veered away as the nets are withdrawn by the opposite hole. The fish that have been caught being removed, the nets are drawn back to their places by the line. A line of nets reaches about 400 yards, and the fisherman generally endeavors to carry it entirely across a strait or pass in the lake which fish are known to frequent.

"Every second or third day, fishermen who are careful take their nets out of the water to dry and repair them. If this be not attended to, the threads swell and rot and few fish enter the meshes; the floats also become water-logged if not often dried. In severe weather, the fisherman erects a canvas or skin screen to windward, to shelter him while he overhauls his nets. Esquimo snow barricades are much more effective, but pride will not permit the Orkney or Canadian fisherman to turn the useful expedients of the Esquimaux to account."

On the west side of the Rocky Mountains, families of Indians may be found, both in winter and summer, living where a small stream leaves or enters a lake. They use no nets. The stream is staked from both sides towards the centre, sloping with the water.

In the centre is placed a wicker basket, which is often of a large size. One that was placed in the river, at Fort Macleod, was oblong in form, eight feet long and four feet in diameter. The open end was placed down stream, as the fish were now (November) running up stream. From the rim of the open end, a cone of wicker work extended

inwards about four feet. This cone tapered to an opening about six inches in diameter, and through this the fish passed into the basket. There being no egress, but by the way they came, they remain in the basket. When the basket is lifted into a boat or taken on shore, a lid is opened in the top, and the fish turned out. The proceeds of one day and night were 177 very nice fish, and although none of them were large, the majority were fit for the table. Fresh water Herring were most numerous, then Suckers, three or four Chub, and one Ling or Burbot. Later in the season, the large fish were caught. In summer, Trout were the principal fish; at this time, they were always running down stream.

East of the mountains I have never seen the basket used, but fish weirs are common. Last season, two families of Indians were catching large numbers of Pike and other fish, at the forks of the Red Deer and Etoimomi Rivers, by means of one. They had constructed a dam about three feet high, all the way across the river, except in one spot. Below this opening, they had hammered in sharpened stakes and woven willows around them, so that a complete paddock was formed. At pleasure, they could run the water off and take out the fish.

After White-fish, Trout are reckoned the best, and, certainly, they are the most sought after. Both east and west of the Rocky Mountains, they are in great numbers, and are easily caught by the fly or a piece of pork on a common hook. In northern British Columbia, they are in multitudes in every stream, are fine flavored and quite large. Their flesh is generally salmon-colored and very firm. Within the Rocky Mountains, we caught numbers of a beautiful trout, which was called by the Half-breeds, the "Arctic Trout." Its flesh, however, was white and soft, and far inferior to the commoner species.

In all the mountain streams, which unite to form the South Saskatchewan, there are multitudes of beautiful trout.

Three species are very common, and easily taken by means of a small piece of pork on a hook. One species is very common in the small brooks, and may be regarded as a large sized brook trout. Another species, rather larger, has soft white flesh, and is not so palatable as the other. In the larger streams, and in the mountain lakes and tarns is a third species, which may be looked upon as the Mountain salmon, on account of its size and flesh, and the sport it gives the angler before its capture. This is the fish for sportsmen, as its size and agility make it a difficult fish to capture, and as it is from five to thirty pounds in weight, it requires more than common ability in the angler to land it.

Our mode of catching these, in Bow River, was to wade into the stream and fish for them in the rapids. When one was hooked, it required all our dexterity to land it, and very often, a souse in the water, on account of the slippery stones, was all we received for our arduous labor. On one occasion, one of the men was standing on a log close to the margin of the river, when an enormous fish took the hook, and before he was aware of it, he was sprawling in the water. He had been using the trawling line which we use for pike, and although he was considerably startled by the plunge in the ice cold water, he held on to the line, and three of us shortly after landed a noble fish about twenty-five pounds weight.

To the sportsman, and the lover of picturesque and sublime scenery, there is no place on the American Continent that holds out inducements equal to those to be found in the Bow River country. Hunting or fishing, as he turns his gaze to the west, he will see towering up to the skies, peak over peak, the everlasting hills. If he watch the clouds forming around the snowy peaks, and dispersing as they float towards the plain, he will see beautifully exemplified the great laws of condensation and evaporation. Should he be an artist, the varicous bits of color, as the clouds come and

go, will fill his heart with delight, and he will desire to live under their shadows for ever. And should the mountains become tiresome, he has only to turn to the east, and look over the swelling prairie, until in the distance the grassy mounds melt into the limitless horizon. Still looking eastward, the hum of the busy multitude 1,000 miles away, will fall upon the ear of the mind, and the dreamer can spend hours, thinking of the time when all the intervening plains will be alive with teeming millions, and the mountain barrier at his back be the gateway to the "Golden West."

Within the mountains besides fishing, hunting the Big Horn and the Rocky Mountain Goat will give exciting sport. Should the student of nature desire to examine the recesses of the mountains he can easily do so, as any of the beds of shingle will lead him into narrow canyons or beside tiny waterfalls, which come from giddy heights or far up the slopes where he will see the power that frost and rain exert in pulling down the mountains. A few short years and this hitherto unknown region will be the shrine to which many weary pilgrims will turn their faces and gain that health and vigor denied to many of the devotees of the more fashionable resorts of the East. When the iron horse goes snorting up the Pass, much of the wildness of the present will have passed away for ever, but the ever varying beauty of the mountains will remain, and the heart will be cold indeed that does not glow with pleasure as the eye roams over the unrivalled beauty of the ever changing panorama.

The Gold Eye is a beautiful fish, and if other and better fish could not be obtained it would be more highly prized than it is. It is generally about fourteen inches long, rather flattened and with white and delicate flesh. Its large and shining scales give it a silvered appearance, and its extremely large eye, with a yellow iris has won its English name "Gold Eye." This fish is abundant in all the rivers of the plains and was the only fish taken with

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bait except the Pike. No matter how muddy the water we could always reckon on Gold Eyes.

Sturgeon are often caught in great numbers in the Saskatchewan, Red, and Assiniboine Rivers. There are two species of this fish in the Saskatchewan. Sir John Richardson places its northern limit in about $54\frac{1}{2}$ degrees north latitude. The smaller species (*Accipenser Rupertianus*) has a tapering snout. It seldom exceeds ten or fifteen pounds weight. The other is the *Namèyu* of the Crees, and often weighs ninety pounds and sometimes even attains the weight of one hundred and thirty. Its snout is short and blunt, being only one third as long as the entire head. This species ascends the Winnipeg River and enters the Lake of the Woods and sometimes ascends Rainy River to Fort Francis. Many fine sturgeon are speared in the Assiniboine and Red Rivers by Indians but there is no systematic attempt made to make a business of their capture. I append Archbishop Tache's account of this fish:—

“There are Sturgeon in North America as well as in Northern Asia. Not only does the Pacific Ocean send them in crowded shoals into the rivers flowing from this country, but our lakes are not without them. This large fish delights in a part of this territory; it willingly frequents Lake Winnipeg, and nearly all the important rivers flowing into and out of it; there are some in the lower part of English River, but they do not ascend beyond the fall at Frog Portage, and they try in vain to get over Carp Rapids in Rapid River, a tributary of the Saskatchewan; so that the neighborhood of Frog Portage is the northern limit to which they reach in the interior of the country. Nor are they found to the west of this point in the same latitude; but to the south and east they are generally distributed. In our great central basin they are found in abundance. There are very fine sturgeon in Lake Winnipeg; I have seen them seven

feet long and one hundred and fifty pounds in weight. The fish is excellent to eat; it furnishes a great deal of oil, and its air-bladder, simply dried, supplies the very useful isinglass of commerce.

"Salt provisions are as yet not much used here, and salt is so dear that salting Sturgeon has not hitherto been thought of; but such a method of preserving them would be more profitable than the plan adopted by the Indians of merely drying some pieces."

In the future the fisheries of Lake Winnipeg, Manitoba and Winnipegosis will be developed to such an extent that fish will be a large article of diet and pay a remunerative price to the regular fishermen. The communities settled in the vicinity of the Qu'Appelle and Long Lakes will have abundance of the finest White Fish at their doors, and should their lakes become exhausted, they can very easily be restocked as the artificial breeding of fish in the Dominion has become a regular branch of business.

Dr. G. M. Dawson when naturalist to the Boundary Survey collected twenty-two species of butterflies, many of which were very beautiful and sometimes in great numbers. During the month of June in the partially wooded country, small blue butterflies are very common and at the same time many of the commoner species of Ontario are seen flitting about in myriads. Later in the season numerous active species of small size are seen on the prairie sucking the nectar of the various Compositæ which cover the plain with their showy flowers. Towards the end of October large numbers of a species of *Colias* congregate on the damp mud along the trail or are seen lazily sitting on the late flowering *Astus*. Scarcely any moths were noticed at any time and during all the summers spent on the plains a large one was never seen. It is true that owing to the attacks of the mosquitoes we were seldom out of our tents after sundown and may not have been abroad when they flew.

Many species of beautiful Coleoptera were obtained on the "Great Plains" which on investigation proved to be a part of the insect fauna of the South-Western States. It is a curious fact that in both fauna and flora the south-western part of the North-West Territories contains many species common in California, and further investigations will likely add many other species as every year new forms are being added to the list. This fact is one more link in the chain of proof regarding the source of the warm winds of the South-West and tends to show the permanency of the mild climate.

In the past the plague of grasshoppers has been on the land more than once and in the future may reasonably be expected again. Dr. G. M. Dawson, from whom I have quoted so often, has paid a great deal of attention to this subject and thus deals with it in his Report on the International Boundary Survey:—"The grasshoppers forming destructive swarms in the region of the plains east of the Rocky Mountains, appear to belong to a single species, which has been called *Caloptenus spretus*. This insect much resembles the *Caloptenus femur-rubrum*, or red-legged grasshopper, which in exceptional years has been destructive to crops in various parts of the Eastern States. *Spretus* differs, however, from *femur-rubrum* specifically, and can not only be distinguished from it in form, but possesses a far higher degree of instinct and power of migration, circumstances suiting it to the almost boundless plains which it inhabits.

"Locusts are not natives of the eastern region of the plains, where their devastations are most severely felt. They come from the far west as a winged swarm, and where they happen to be when they are mature, their eggs are deposited. From these eggs, in the ensuing spring, the young come forth, and cause often more complete destruction of crops than the winged adults; for they attack the young grain, eating it down as fast as it grows. The

young so produced, however, appear not to have so much vitality as those coming fresh from the west. A great part of them may reach maturity and migrate some distance, but their progeny in the third season seems rarely to give much trouble.

"The range of the insect (meaning by that term not only their chief breeding places, but the whole area known at one time or other to be overrun by them) is not bounded to the west by the Rocky Mountains, except where these constitute, as in British America, the unbroken front of the western region of forest. They spread across the watershed in Colorado and Utah, and appear to have been observed by Mr. Byers, in the valley of the South Fork of the Columbia River, near Fort Hall. Southward, according to Prof. Thomas, they extend as far as the Raton Mountains and into Texas; while to the east they have spread to the prairie country of the Mississippi, and have been known, on more than one occasion, to penetrate far into Iowa. The entire Province of Manitoba is liable to their incursions, and they have penetrated in swarms as far east as the Lake of the Woods. Northward, they are probably only limited by the line of the coniferous forest, which approximately follow the North Saskatchewan River.

"The eggs of the Locust are not deposited promiscuously, or uniformly distributed over the surface; whether in their native breeding places or in their eastern colonies. High and dry situations, with hard soil, are preferred. Thus, when the young are hatched, from this original deposition of the eggs—and no doubt also from a natural gregarious tendency—they form colonies, which are often widely separated. These I have seen on the third prairie plateau in 1874, and the young insects are also noticed to be thus distributed in the Red River Country this year, and elsewhere, wherever they have been carefully observed. The insects do not seem to travel far from their hatching place for some

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days; but when they have increased somewhat in size, they begin to move forward together, and in a determinate direction, though not by any means invariably from northwest to southeast. Prof. Studley of Kansas, has experimented on the unfledged grasshoppers, by sifting flour on them in the morning, and measuring the distance travelled over by the insects so marked at night, and finds that their rate of progress is from one-fourth to one-half mile per diem. In the last week of July, 1873, I met the grasshoppers hatched out in the northern part of the Red River Country, travelling southward down the valley. They were in the pupa stage, and appeared to be advancing more rapidly than the above measurement would indicate. Their fixed determination to travel southward was remarkable.

"On obtaining their wings, the grasshoppers prepare for flight, and only wait the advent of a favoring breeze, to set out in the direction which their instinct leads them to pursue. On July 12th of last year, I observed swarms ready for flight on the high plains of the third plateau, west of White Mud River (long. 107° 35). The day was hot and calm, and though many of the insects were on the wing at all altitudes in the atmosphere, they were following no determinate direction, but sailing in circles, and crossing each other in flight. The greater number were hovering over the swamps and spots of luxuriant grass, or resting on the prairie. A slight breath of air would induce them all to take wing, causing a noise like that of the distant sound of surf, or a gentle breeze among pine trees. They appeared ill at ease, and anxiously waiting a favorable wind.

"The grasshopper has not intrinsic powers of swift flight. It can bear itself upon the wing for a long time, but depends chiefly on the wind for propulsion, and travels fast or slow according to its motion. It flies only in the sunlight and during the warmer hours of the day, coming to the ground about 4 p.m., if the day be fine; or at any time when a

heavy cloud covers the sun, or on the approach of a storm. Nor does it fly in any direction the wind may happen to blow, but has the extraordinary instinct to travel only on those days when the wind may favor it in its appointed course. This, as already mentioned, is generally south-eastward, from its high-land breeding grounds to the lower and more fertile eastern regions. It is not by any means invariably so, however; and some of the broods hatched this spring are already showing a similar persistent desire to move northward, while in their full strength and vigor. When the locust reaches nearly its eastern or southern limit, the organization of the swarms appears in great measure to fail, they move in almost any direction with the wind, or remain long on the ground where food is abundant. After the deposit of eggs, which in the normal sequence of events next happens, the insects are much exhausted, and soon die, though often making a short fickle flight.

"Such is the life-history of the insect. The causes which fortunately prevent its increase and continued abode in the eastern prairie region, appear to be chiefly climatic. It would seem that the locust requires, to bring it to healthy maturity, the dry warm climate of the higher plains. In the eastern colonies the young are sometimes hatched in considerable numbers by a mild autumn, and perish in the succeeding winter. A relapse of cold and damp weather after their hatching in spring, causes the death of great numbers. The eastern brood is a weaker one, and is accordingly more subject to the attacks of diseases, and parasites. Mr. Riley catalogues four of the latter. The two first (*Trombidium sericeum* and *Astoma gryllaria*) are mites; the two latter (*Tachina anonyma* and *Sarcophaga carnaria*) flies, the larvae of which feed on the grasshopper and live within it. All these seem to have appeared in connection with the swarm of 1874, and their progeny of this spring, in Manitoba. The *Trombidium*, or silky white, attacks the

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egg. The *Astoma* attaches itself to the mature insect, generally under the wings.

The first appearance of the locusts in formidable numbers in the Red River Valley, seems to have been in the year 1818, six years after the foundation of Lord Selkirk's colony. They then arrived on the wing in the last week of July, and destroyed nearly everything but the wheat crop, which partly escaped, being nearly ripe. Eggs were deposited, and in the following spring, the wheat and all other crops were destroyed as fast as they appeared above ground. Eggs seem again to have been deposited in 1819, and in 1820 the crops are said once more to have suffered greatly. The next recorded incursion is that of 1857, from which it would seem that for 36 years the insect had not appeared. In 1857, the crops are said to have been so far advanced as to escape great damage, but eggs were deposited, and in 1858 all the young grain was devoured. In 1864, they again appeared, and left their eggs, but neither the adults, nor the young of 1865 were sufficiently numerous or wide-spread to do much damage. In 1867, numerous swarms poured in, but did little injury, the crops being too far advanced; their progeny in the ensuing Spring, however, devoured everything, causing a famine. They again appeared in 1869, the young in 1870 doing much harm. In 1872, fresh swarms arrived, but as usual, too late to do much damage to wheat. Eggs were left in abundance in the northern part of the Province, and in the following Spring the farmers over considerable districts did not sow. In 1874, winged swarms came in from the west, arriving earlier than usual, and inflicting great injury on the crops in some districts. Eggs were deposited in almost all parts of the Province, and the result has yet to be seen."

During the fall and winter of 1875 they all died, and since then Manitoba and the North-West have not been visited by them.

Mosquitoes are a real plague and cause more irritation to man and beast than all other plagues together. Little need be written about them as like the summer's heat and winter's cold they are of periodic occurrence. Another insect, named by the Half-breed the "Bull-dog," is a terrible pest during the month of July. He is only troublesome however about the middle of the day and seldom remains more than a few days at a time. Flying ants are troublesome in August but they seldom remain many days, and only fly when the day is very warm and sultry.

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CHAPTER XXIII.

Minerals of the North-West.

Boundary of the Laurentian Series—Lower Silurian Rocks—Limestone at the Stone Fort near Winnipeg—Building Stone of Winnipeg—Devonian Series along Lakes Manitoba and Winnipegosis—Salt Deposits in these Rocks—Pure Salt Collected in 1881—Description of the Manufacture of Salt on Lake Winnipegosis—Devonian Rocks on Peace River—Gypsum, Salt, and Petroleum—Gypsum on Peace River—Salt Springs of Salt River—Tar Springs on the Athabasca—Cretaceous Series—Its Extension—Limestone and other Boulders—Gravel and Sand—Niobrara Limestone—Souris Coal Field—Coal in the Peace River Country—Lignite Tertiary—Its Probable Extension—Coal Deposits of Immense Extent—Pure Hematite in connection with the Coal—In the Saskatchewan Country—At Edmonton—Along Peace River—Its Probable Value—Gold on the Saskatchewan—On Peace River—Gold Washing Seldom Remunerative—Brick Clays—Their Great Value and Probable Extent—Concluding Remarks.

GEOLOGICAL Formations represented in the North-West are very few, and a glance at a map will suffice to explain fully the following notes. On the east side of Lake Winnipeg, the Laurentian series extend from the shore line, for the greater part of the length of the lake. Striking north-westerly from the head of the Lake they appear at the western end of Lake Athabasca as a series of glaciated rocks, glistening in the sunlight like polished silver. Along the northwest shore of Lake Winnipeg, the rock exposures are Lower Silurian and those at the stone Fort are described as the Hudson River Group of the same series. On Pine Island Lake near Cumberland House, and at the Grand Rapids of the Saskatchewan are many fine exposures of the Silurian series.

The rocks of the Hudson River Group furnish the building stone for the "Stone Fort," Fort Garry, all the old churches in the vicinity of Winnipeg, and all the stone for the foundations of the massive structures which have been and are now being erected in Winnipeg. Stoney Mountain will be a mine of wealth to future speculators, from which

lime, stone, and gravel will be procured for the wants of the city.

Lying farther south and possibly underlying the greater part of the western side of the Manitoba Plain are the Devonian Series. These rocks are known to be largely developed on both sides of Lakes Manitoba and Winnipegosis. Numerous salt springs are found in connection with them, and during the last summer the writer saw salt springs and brooks of strong brine flowing from them in various localities at the head of Lake Winnipegosis. The subjoined list of salt springs known to occur on Lakes Manitoba and Winnipegosis may tend to excite interest in these extensive deposits:—

1. Crane River, Lake Manitoba.
2. Water Hen River, Dickson's Landing.
3. Salt Point, east side of Lake Winnipegosis.
4. Salt Springs,
5. Pine River, } Winnipegosis.
6. Rivers near Duck Bay, }
7. Turtle River, Lake Dauphin.
8. Swan or Shoal, two localities.
9. Salt River flowing into Dawson's Bay.
10. Numerous salt springs and bare saturated tracts of many acres in extent on Red Deer River, which flows into the head of Dawson Bay, Lake Winnipegosis. For ten miles up this river salt springs are quite frequent, and excellent salt was collected in three places where it formed a crust on the surface of the ground. Some springs were examined where a respectable rivulet of strong brine issued from them clear as crystal and evidently quite pure. All the springs and marshes seen were bordered with seaside plants, and one of them, which has never been found from the sea coast before in America, was found in abundance. The plant referred to is Sea Side Plantain (*Plantago Maritima*.)

From time immemorial, salt has been manufactured along the west sides of Lakes Manitoba and Winnipegosis, and at Salt Springs the manufacture was carried on by John Monkman, in 1859, when the works were visited by Professor Henry Y. Hind. The manufacture had been carried on for forty years prior to that time by Jas. Monkman, his father. Professor Hind thus describes the springs and the manufacture of salt at the time of his visit:—

“The soil at the Salt Springs is a very retentive yellowish-white clay, containing small limestone boulders and pebbles, with boulders of the unfossiliferous rocks. The wells, for obtaining a supply of brine, are sunk wherever a small bubbling spring is observed to issue from this retentive clay. The springs are constantly changing their position, and as the wells become exhausted from time to time, a fresh excavation is made where a new spring is observed to issue. No doubt boring, or deeper wells, would prevent these changes, and not only secure a larger flow of brine, but insure its permanency. The wells at present are twenty-five in number; but some of them appear to have been lately abandoned, and others have long since ceased to yield brine. They are situated four hundred yards from the lake shore, and were first worked forty years since, by James Monkman. He has made salt at both Swan and Duck Rivers. The manufacture is now carried on with profit for the Hudson's Bay Company, at Swan River, and at Winnipegosis Lake by Monkman's sons.

“At the ‘Works’ there are two small log-houses and three evaporating furnaces. The kettles of English construction, are well-made rectangular vessels of iron, five feet long, two feet broad, and one foot deep. They are laid upon two rough stone walls, about twenty inches apart, which form the furnace. At one extremity is a low chimney. The whole construction is of the rudest description; and at the close of the season the kettles are removed,

turned over, and the furnace permitted to go to ruin, to be rebuilt the following spring.

"The process of making salt is as follows. When a spring is found a well five feet broad and five feet deep is excavated, and near this an evaporating furnace is erected. The brine from the wells is ladled into the kettles, and the salt scooped out as it forms, and allowed to remain for a short time to drain, before it is packed in birch bark coggins for transportation to Red River, where it commands twelve shillings sterling a bushel, or one hundred weight of flour, or a corresponding quantity of fish, pemican, or buffalo meat, according to circumstances."

While on the subject of salt I cannot do better than speak of that which is obtained on Salt River, an affluent of Slave River. Salt obtained here is used throughout the north. In September, 1875, during my visit to Fort Chipewyan at the western end of Lake Athabasca, a boat load of excellent salt was brought up from Salt River. It differed from common coarse salt in consisting of large cubical crystals, which were very hard when placed under the teeth.

Sir John Richardson, in his narrative of the Arctic Searching Expedition under his command, thus speaks of the salt deposits on Salt River:—"In 1820, I ascended the very tortuous Salt River, for twenty miles, for the purpose of visiting the salt springs, which give it its name. Seven or eight copious springs issue from the base of a long even ridge, some hundreds of feet high, and, spreading their waters over a clayey plain, deposit much pure common salt in large cubical crystals. The *mother water*, flowing off in small rivulets into the Salt River, communicates to it a very bitter taste; but before the united streams join the Slave River, the accession of various fresh-water rivulets dilutes the water so much that it remains only slightly brackish. A few slabs of greyish compact gypsum protrude

from the side of the ridge above mentioned, and a pure white gypsum is said to be found at Peace Point on Peace River, distant about sixty or seventy miles in a southwest direction, whence we may conjecture that these springs may belong to the Onondago salt group of the Helderberg division of the New York system. The Athabasca and Mackenzie River districts are supplied from hence with abundance of good salt. We obtained some bags of this useful article from Beaulieu, who was guide and hunter to Sir John Franklin on his second overland journey, and who has built a house at the mouth of Salt River. This is a well chosen locality for his residence. His sons procure abundance of deer and bison meat on the salt plains, which these animals frequent in numbers, from their predilection for that mineral; and Slave River yields plenty of good fish at certain seasons."

The Devonian rocks crop out on Peace River, below Fort Vermillion, and show very fine sections at the falls on Peace River near Little Red River, and at other points. All the rock at the falls is a blueish limestone, which, when fully exposed to the influence of the weather, breaks up into thin layers. On the right bank, immediately below the falls, it forms cliffs from twenty to thirty feet high. The River at this point is nearly a mile wide, and presents a series of little falls all the way across. The many small rocky islands and isolated rocks that rise out of the river, and on the brink of the fall, all the way to the other side, form a beautiful panorama of rushing and falling water, with wooded or rocky islets, succeeded below the falls by placid river and sylvan scene. At present (August 15) the fall is about fifteen feet, but at high water it cannot be half as much. A couple of fossils were obtained here, which were identical with others collected from a different locality. The islands in the river below the falls are rocky; rocks are also exposed on the right bank for about two miles, and are then

concealed. About three miles below the falls Little Red River comes in on the right bank, and, at its outlet, a different rock formation presents itself. The beds are composed almost altogether of many species of corals. There is a good exposure, and, as we took a day here to rest, I made a large collection. The lower layers are of fine texture, thin bedded, and without fossils. These are followed by beds almost wholly made up of those branching corals (*Alveolites*) so common in Devonian rocks, intermixed with a species of *Zaphrentis* in great abundance, some of the higher strata being largely made up of these, but occasionally associated with others of a rounded form. Above the latter there are, at least, six feet of rock holding large corals, in which the fine structure was nearly obliterated by the crystallization of the mass. Others were observed in concentric layers; and some, when broken, fell apart as if formed in successive laminae.

Another outcrop occurs about a quarter of a mile up Red River. No fossils were observed here, but the rock, which is heavy-bedded and in a nearly horizontal position, appears to overlie those just described, and adds a few feet to the total thickness exposed. The rock at this point seems to overlie that at the *chuttes*.

Approaching "Rapid Bouillé" the banks of the river begin to attain some elevation, but no rocks are exposed until the head of the rapid is passed; then limestone crops out, but so much broken and contorted that its dip is not apparent. Many fossils were found at this point, both loose and in the rock. A few yards below this, fine white gypsum crops out, and continues as the lowest rock in the section for the next twenty miles. This is overlaid by a light grey granular rock, largely made up of gypsum; perhaps a limestone was observed in it, but there were no fossils.

Descending the rapid the rock rises higher and higher along the shore, and by the time the lower end is reached,

it has attained a height of at least fifty feet above the water. At the foot of the rapid the river is divided into two channels by a high rocky island, which stands almost in the centre of the river. In many places the gypsum attains a thickness of from ten to fifteen feet, and is as clear and white as snow. The banks of the river and the islands from here to Peace Point, a distance of fifteen miles, show this rock generally much contorted, but seldom broken. At one point on the high bank the beds have been upheaved without being broken, to the height of at least forty feet, and show a very fine example of curved strata.

On the Athabasca there are large deposits of bituminous shale, which are the source of the petroleum or mineral tar so frequently spoken of in connection with that river. I passed up the river in September, 1875, and noted down what I saw. After entering the river from Lake Athabasca we gradually passed from mud to sand, but we went fully fifty miles before we saw anything like a pebble. The first indications of "tar" were in the shape of pebbles composed of sand and tar, formed above and carried down by ice.

About two miles below Echo's home we came upon the first gravel beach, and at Echo's the true bank showed for the first time on the left, but it was noticed about a mile above Embarras River on the right, and many times afterwards, showing that the river was eroding its right bank, while forming new land on the left. At this point the soil on both sides of the river is good, and the banks have the reddish tinge observed at Vermillion. Later in the day Birch Mountain showed blue in the distance, bearing about southwest.

As we ascended, the river banks kept increasing in height, and the country began to assume the appearance of a good agricultural region. No rock was seen, but the "tar conglomerate" became very abundant, often being in beds two feet thick. Early on the afternoon of September

7th we came upon the shale beds which produce the tarry matter. After passing along them for about two miles, we stopped to trade for some dried meat, when I had an opportunity of examining them. I found below a light grey sandstone, partly saturated with tar, and overlying this there was at least fifteen feet of it completely saturated, and over this again shale largely charged with alkaline matter. This was the sequence all the way, although at times there was much more exposed. Where we landed, the ooze from the bank had flowed down the slope into the water and formed a tarred surface extending along the beach over one hundred yards, and as hard as iron; but in bright sunshine the surface is quite soft, and the men when tracking along shore often sink in it up to their ankles. During the remainder of the afternoon we sailed past other rock exposures, but observed no change in their aspect or mode of occurrence, though very often they were much higher. Next morning we had travelled about two hours when we stopped at a tar spring to procure the tar which was obtained last winter. The rock here was just the same as that seen yesterday. Instead of getting the tar on the beach, as I expected, I was led up the hill until we attained the height of forty feet; here we found a small pool of water, and underneath it the pure tar. I noticed a little stream of water flowing into the pool, which was coated with an oily scum, and under the stream there was an abundance of tar. Along the beach it was seen oozing out in many places, and by gathering and washing the sand saturated with it, we obtained just as pure tar as we brought from the spring on the hill-side.

Bluish concretionary limestone, in appearance like that at Little Red River, crops out on both sides of the river at Point of Rocks, forming cliffs twenty-five feet high. The upper beds are thick and withstand the weather, but about six feet from the top, these gave place to rock which

crumbles exactly like that containing the large corals at Red River. For more than twenty miles this rock was observed, and it was from it that the fossils were obtained, labelled "thirty miles below the forks." After about twenty miles, we again came on the tar shale, and passed the place where the Hudson's Bay Company get their supply for the boats. All the limestone passed to-day was cream colored or light grey, and was heavily bedded on top, but had much the appearance of shale below. The frost disintegrates the latter, and it separates into fragments suitable for road-making. Nearly all the strata show graceful curves, the folds never rising higher than ten feet. The dip is about north and south, the strike crossing the river at nearly right angles.

Within ten miles of the forks, a very fine section of the rock is exposed, showing the limestone, and then about ten feet of yellowish clay, followed by at least 100 feet of black shale, which looked like sandstone, and in the distance resembled the shale between Dunvegan and Smoky River. Alkaline springs were observed oozing out of these strata, but there was no tar.

I have no doubt but that the shale, out of which the tar comes, overlies the coral formation observed at Red River. Exactly at the forks, the latter rises out of the water, capped by at least 150 feet of black shale, from which the tar oozes, and these are surmounted by a few beds producing an alkaline efflorescence. Mr. Moberly told me that the tar beds extended up the Athabasca to near the mouth of Lac la Biche River, and I found that they still continued up the Clearwater, but eventually sank beneath the soil. About ten miles up the Clearwater, the men pointed out a tar spring in the stream, from which tar was very often obtained.

Before passing the Pembina River, we came upon sandstone which is suitable for making grindstones. This rock was occasionally seen for about two miles, when signs of

tar again appeared. These passed away, and limestone was occasionally seen, and towards evening, I procured those fine fossils which were so much admired. For nearly a day after this, no rock exposures appeared, but when we came upon the rocks again, they differed from any I had yet observed. They were cream-colored, shaly, non-fossiliferous limestones. After passing these, we came to the sulphur springs. Four little creeks discharge these springs. They are said to be very bitter, and their margins are lined with sulphur. Sir John Robinson, in his narrative, says: "At eight, we came to a sulphurous spring, which issues from the limestone on the bank of the river. Its channel is lined with a snow-white incrustation, the taste of the water is moderately saline and sulphurous, and, from its coolness, rather agreeable than otherwise. It has a slight odor of sulphurated hydrogen."

Speaking of the bitumen, Sir John says: "About thirty miles below the Clearwater River, the limestone beds are covered by a bituminous deposit upwards of one hundred feet thick, whose lower member is a conglomerate, having an earthy basis much stained with iron, and colored by bitumen. Many small grains and angular fragments of transparent and translucent quartz compose a large part of the conglomerate, which also contains water-worn pebbles of white, green, and otherwise colored quartz, from a minute size up to that of a hen's egg or larger. Pieces of green-stone and nodules of clay-ironstone also enter into the composition of this rock, which, in some places, is rather friable, and in others, possesses much hardness and tenacity. Some of the beds above this stone are nearly plastic, from the quantity of the mineral pitch they contain. Roots of living trees and herbaceous plants push themselves deep into beds highly impregnated with bitumen; and the forest where that mineral is most abundant does not suffer in its growth.

The shale banks are discontinued for a space, in the neighborhood of Beren's House, where thin beds of limestone come to the surface, and form cliffs twenty or thirty feet high at the water's edge.

Still farther down the river, or about three miles below the Red River, where there was once a trading establishment, now remembered as *Le vieux Fort de la Rivière Rouge*, a copious spring of mineral pitch issues from a crevice in a cliff composed of sand and bitumen. It lies a few hundred yards back from the river, in the middle of a thick wood. Several small birds were found suffocated in the pitch.

At the deserted post, named *Pierre au Calmet*, cream-colored and white limestone cliffs are covered by thick beds of bituminous sand. Below this, there is a bituminous cliff, in the middle of which lies a thick bed of the same white earth, which I had seen higher up the river in contact with the limestone, and following the undulations of its surface.

A few miles farther on, the cliffs for some distance are sandy, and the different beds contain variable quantities of bitumen. Some of the lower layers were so full of that mineral as to soften in the hand, while the upper strata, containing less, were so cemented by iron as to form a firm dark-brown sandstone of much hardness. The cliff is, in most places, capped by sand containing boulders of limestone. Every bituminous bed, carefully examined with the microscope, was found to consist, in addition to the bitumen, of small grains of transparent quartz, unmixed with other rock, but enclosing a few minute fragments of the pearly lining of a shell. A similar bed in another locality contained, besides the quartz, many scales of mica. The whole country, for many miles, is so full of bitumen that it flows readily into a pit dug a few feet below the surface.

Dr. George M. Dawson, Assistant Director of the Geological Survey of Canada, in his report on the geology of the 49th parallel, thus speaks of the distribution of the Cretaceous Rocks in the North-West Territories:—

“The Cretaceous rocks, corresponding in age with the great chalk formations of Europe, though very different from them in mineral character, are those which spread over by far the greatest surface. Except in a few localities, and those chiefly in proximity to the Rocky Mountain region of uplift, they are still almost as perfectly horizontal as when originally deposited. The eastern edge of this formation partly overlaps the underlying Silurian and Devonian beds, and runs nearly parallel with the base of the Laurentian range, at a distance of about one hundred and thirty miles, from the fifty-third to the fiftieth parallel of latitude. Southward, it tends to the east, and probably crosses the forty-ninth parallel east of Red River; while in south-western Minnesota, Cretaceous rocks repose directly in some places on granites, which are no doubt Laurentian.

“The general course of the eastern outcrop is consequently about north-north-east; and it is marked broadly, by a series of escarpments and elevations, including—from south to north—Pembina, Riding, Duck, Porcupine, and Basquia Mountains. All these appear to be composed for the most part, if not entirely, of Cretaceous rocks, though the extreme edge of the formation may often stretch beyond them. These so-called “mountains” are, more correctly speaking,—as already shown—salient points of the edge of the second plateau, and the generally horizontal position of the beds thus suddenly cut off to the east, attests the immense denudation which must have taken place in comparatively modern times.

“North of the Basquia Mountain, from the very scanty information we at present possess, the edge of the Cretaceous would appear to run westward, and cross the Saskatchewan

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River, near Fort à la Corne, where at Cole's Falls a dark-colored shale which has been referred to the lowest member of the series, occurs. It may very probably be nearly conterminous with the edge of the second plateau, which, according to Dr. Selwyn, crosses the river forty-five miles below the Fort. The western border of the Cretaceous seems, in some places, to follow closely along the base of the Rocky Mountain Range, but many circumstances arise to complicate the question in that region, and it will only be after the accumulation of much more information than is at present in our possession, that the line can be laid down with any accuracy. In some parts of the range, Cretaceous rocks have been included among the mountains themselves, and considerably altered; but the greater part of the newer strata, which must have covered the palæozoic rocks of this region when the uplift first took place, have been removed by denudation.

"The Cretaceous rocks thus defined in breadth, north of the boundary line, have been noted by Professor Hind, Dr. Hector, Dr. Selwyn, and Prof. Bell, in many localities on the second prairie level, some of which are more particularly referred to in the sequel, and are known to extend in a broad zone from the North Saskatchewan to the Mexican frontier and southward.

"Our knowledge of the Cretaceous beds beyond the North Saskatchewan, is as yet very limited, and depends almost entirely on the observations of Sir J. Richardson, aided by chance notes of other explorers not professed geologists. It is likely, however, that a trough or series of more or less isolated basins of lignite and coal-bearing strata, follows near the eastern base of the mountains the whole way to the Arctic Sea. A part of these beds is known to represent the Lignite Tertiary of the south, but judging from their association elsewhere, they will probably be found to rest on Cretaceous rocks throughout. Indeed,

from the fragmentary nature of the information concerning the great northern region, and the unsettled questions with regard to the age of the coal series of the analogous region, near the mountains and south of the North Saskatchewan, it is impossible to decide whether some of the coals and lignites described, may not belong to the Cretaceous formation itself. The existence of Cretaceous beds has, however, only been determined with certainty at a single locality, on the Bear Lake River, near its junction with the Mackenzie. Sir J. Richardson, here, discovered an *Ammonite* among sandstones and shales which he states resembles those of the coal measures."

The subdivision of the Cretaceous, as it occurs in Manitoba and the North-West Territories, will require discussion after the systematic description of the localities in which it has been examined. From its close general resemblance, however, to that which has been studied in the western part of the United States, it will be useful to have the Upper Missouri Section of Meek and Hayden, which has now become typical, as a standard of comparison. The formation is there composed as follows in descending order:—

Later Cretaceous.

- No. 5. FOX HILL BEDS.—Grey, ferruginous and yellowish sandstones and arenaceous clays. *Marine Shells*..... 500 feet
 No. 4. FORT PIERRE GROUP.—Dark grey and blueish plastic clays. *Marine shells, gypsum and fish remains*..... 700 feet

Earlier Cretaceous.

- No. 3. NIobrARA GROUP.—Calcareous marls, Marine shells, fish remains, Foraminifera, &c..... 200 feet.
 No. 2. FORT BENTON GROUP.—Dark grey laminated clays with some limestone. *Marine shells*..... 800 feet.
 No. 1. DAKOTA GROUP.—Yellowish, reddish, and whitish sandstones, and clay, with occasional lignites. *Marine and some fresh water shells and Angiospermous leaves*..... 400 feet.

Giving as an approximate thickness of the formation in that region, 2600 feet.

The Lignite Tertiary rocks north of the line are not bounded by any great physical features of the country, but adhere closely to the upper members of the Cretaceous, and behave as an upper member of that formation might be expected to do. Though no doubt originally deposited in extensive basin-like depressions of the Cretaceous strata, these are now generally found forming slightly elevated plateaux. Denudation must have acted on these rocks on a vast scale, but they still cover an immense area and contain the greatest stores of mineral fuel known to occur in the vicinity of the forty-ninth parallel. The line of their eastern edge crosses the parallel near the 102nd meridian, and thence appears to pursue a northwestward course, remaining for some distance nearly parallel with the edge of the third plateau. Beyond the Elbow of the South Saskatchewan, though the same physical feature continues to the north, it is not known what relation it may bear to the outcrop of this formation, nor has its northern limit been ascertained. Between the North and South branches of the Saskatchewan River there is a great tract of country, the geological features of which are still very imperfectly known, but where it is highly probable, outcrops, if not direct extensions of this Lignite formation will be met with. To the west, it appears to extend, at least in some places, nearly to the base of the Rocky Mountains.

"A thick mantle of sands and clays, referable to the glacial period, and to former great lakes, covers almost the entire surface of the plains. A geologist may often travel a hundred miles without once being able to observe a section of the underlying Cretaceous or Tertiary rocks, and but for their great uniformity and simplicity of structure, it would be a very difficult task to unravel the geology of so vast a region. The very monotony of the plains is, however, to a great extent, a corollary of the attitude of the strata

between them, and of their unconsolidated and homogeneous character."

In many parts of the country particularly along the upper slopes of the coulées and river banks there are numerous boulders of various kinds of rock. About one-third are white limestone and the remainder various kinds of metamorphic rocks particularly gniess. Lines of boulders are to be found along the Little Saskatchewan in the vicinity of Rapid City, and much of the land is very seriously encumbered by them. The same complaint is made at Birtle on Bird Tail Creek and westward in the direction of Fort Ellice. Brandon has its share, and when the excitement, which is now at fever heat, begins to die out many will complain of the multitudes of stones which encumber their lots. Fort Ellice and almost every town or village laid out on the bank of a river is in the same category.

Boulders are found in ridges on many parts of the Second Prairie Steppe and often extend for miles in almost straight lines. When the country is more thoroughly examined these ridges will be found to indicate the margins of great depressions, possibly of lake basins of a former period. In the valley that stretches from the source of the Qu'Appelle to the South Saskatchewan there are multitudes of enormous boulders. One of these was measured by Prof. Hind, and was found to be 78 feet in circumference and at least 14 feet in altitude. The next largest was one of limestone, seen on the prairie below the Moose Woods. It is about 16 feet high and at least 60 feet in circumference. In the valley of the Souris near the boundary they are in immense numbers and all appear to lie on the surface. At Livingstone, Swan River, and Banicks they lie so close that no cultivation of the soil could be effected. Scores of places might be enumerated where they lie thickly on the ground and extensive tracts where not one can be seen in a day's journey.

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All the interior lakes be they large or small are margined by a wall of boulders which are pressed into position as perfectly as if they had been placed there by man. Ice is certainly the cause of this in every case and a careful observer cannot fail to be struck with the uniformity with which it acts. While encamped on the shores of Long Lake in July, 1879, my attention was called to a point of rocks which extended into the Lake near its northern end. Two large boulders lay at the base of the heap and between them and the lake were two deep grooves which they had made in the spring when being shoved out of the Lake by ice. Each stone had been forced by ice out of the depths of the lake and left its record behind. A careful measurement was made, and it was found that the stones had been shoved 47 yards or more. We traced the drove into water three feet in depth but how much farther it extended we could not determine.

Gravel and sand are not wanting in any part of the country, although there are wide areas where none appears on the surface. All water obtained from gravel is excellent, and many ponds fed by springs are found where gravel mounds predominate. Nearly all the gravel on the Second Prairie Steppe is coated with carbonate of lime, but on the Third Plateau the character of the gravel changes and is a quartzite with the pebbles so smooth that it seems but as yesterday when it was an old sea beach. In many places, notably the Cypress Hills and elevations over 2000 feet above the sea, along the eastern base of the Rocky Mountains, this gravel is spread as a thin sheet over the surface. I have often noticed it less than three inches in depth, and covering the surface conformably to the undulations. This is the gravel that prevents much of the land south of lat. 50° and in the Bow River District from being fit for agriculture.

Sand is another feature of the plains, and may be said to be a characteristic of the whole country west of Red River

Plain. Sand dunes are found in front of the Second Prairie Steppe, between the Pembina Mountain and Riding Mountain, and are well developed on the line of the Canadian Pacific Railway east of De Winton. By means of these dunes the Railway is carried from the lower to the upper plain, and all travellers must notice the striking resemblance that these hills bear to those along our great lakes on the Ocean itself.

Along the Souris, especially southwest of Brandon, there are numerous sand hills which in many places are little else than moving masses of sand. At Flat Creek, on the line of the Canadian Pacific Railway and southwesterly in the direction of Oak Lake, sand hills are largely developed and are a characteristic feature of the country. At the head of the Qu'Appelle are three groups of sand hills which are gradually shifting eastward by the action of the wind. Along the east and northern faces of the group on the north side of the Qu'Appelle are a series of shallow pools or salt lakes which are dry or nearly so in summer, and from which when the wind blows the saline encrustations rise like smoke and disappoint the weary traveller as he looks anxiously around for a pool of good water. Enticed by the vapor he hastens on, and instead of a camp fire by a pool of refreshing water, he finds a dried up lake and its surface covered with saline crystals. My party became entangled in these sandy wastes on the 11th July, 1879, and before we could extricate ourselves and find water both men and horses suffered severely.

Inside the line of ponds spoken of above the sand begins to rise into hills, which are being constantly blown away to form others. The movement is constantly from west to east, and the hollows and little hills with their trees and bushes are being continually filled up by the eastward movement of the sand. The second group of hills crosses the South Saskatchewan about three miles south of the Elbow,

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and shortly after develops into an extensive sandy tract with sand hills 100 feet high towering up on every hand. The hills were without a particle of vegetation, and were very steep except on the western face where they were furrowed by the wind. Another extensive group lies north of the Cypress Hills near Gull Lake, and are of the same general character. On their southern side surrounded by sand, and in many cases standing in it is a grove of large cottonwood trees. These are probably the last remains of the former forest, yet at present neither tree nor shrub exists within many miles of them. Other groups of sand hills are to be met with, but in general they are all alike, and seem to have been produced by the same cause—~~currents~~ eddies when the land was submerged after the close of the glacial period. The sandy country in all cases is above the general level of the district where they exist.

About twenty-five miles north of the Boundary, where the Boyne River cuts through the Pembina escarpment, limestone beds are seen, which Dr. G. M. Dawson refers to is the Niobrara division of the cretaceous rocks. The rock is a cream-colored or nearly white limestone, breaking easily along horizontal planes, parallel to the surfaces of the shells of *Ostrea* and *Inoceramus*, of which it is in great part composed. The same rock seems to crop out on the Assiniboine, about ten miles below the mouth of the Souris, where it shows fine exposures of nearly horizontal strata. Above Brandon, beds of apparently the same character have been observed, but owing to slides in the river bank, the exposures cannot be properly examined.

In the chapter on fuel, will be found a full account of the coal as it occurs in the North-West, and, therefore, we will only give in this place the extent of the Lignite Tertiary, as shown by Dr. Dawson, in his exhaustive report.

"The total area of the western part of the Prairie region, between the forty-ninth and fifty-fourth parallels, now known by more or less connected lines of observation, to be underlain by the lignite and coal-bearing formation or formations, does not fall short of 80,000 square miles; and should future investigation result in affixing some of the fuels to the lower cretaceous, it must be much greater. The importance of these great deposits of fuel, in a country naturally so destitute of wood over great areas, cannot be exaggerated."

Since this was written, our knowledge has increased, borings have been made in the Souris Coal Field, and workable seams are now known to exist there. Peace River has been further explored, and here, likewise, excellent coal has been obtained. In both cases, these coals belong to the lower cretaceous, and hence the remark in the preceding paragraph, about the extension of the coal fields, is more than carried out, and it is now probable that the area will be nearly doubled.

Brown hematite, in more or less abundance, is known to exist over a very wide extent of the prairie section, and has been observed by myself cropping out in many places on the Saskatchewan and its tributaries, and in numerous places on Peace River. It is generally in thin layers or slightly connected nodular masses, and from the appended analyses, it may be considered a valuable and rich ore. Dr. Dawson thus speaks of its occurrence and value:—

"The ironstones of the Lignite Tertiary formation, to which frequent reference has been made, though occurring very often in the same sections and in close proximity to the lignites, have not been observed in any part of the area examined to occur in considerable thickness. They generally appear in nodular sheets or scattered nodules, following certain horizons in the clays and argillaceous sands, and are found in greater or less abundance in nearly all the

sections examined. Externally they weather to various shades of chocolate-brown and reddish-brown, but are hard and compact in structure, and within preserve their bluish-grey or yellowish-grey color.

"The subjoined partial analyses of specimens collected in 1873, were published in the "Report of Progress" for that year. I regret that the time at my disposal prevents the examination of other specimens subsequently obtained:—

I. Clay Ironstone. (Souris Valley.)

Protoxide of Iron.....	49.00
Water lost at 115° C.....	1.21
Carbonic Acid lost on ignition.....	28.57
Siliceous matter insol. in H. Cl.....	17.04
Phosphorus.....	Trace.
<hr/>	
Metallic Iron per cent, in raw ore.....	30.11
Metallic Iron, in calcined ore.....	54.27

II. Clay Ironstone. (Great Valley.)

Protoxide of Iron.....	46.72
Water lost at 115° C.....	3.57
Carbonic Acid lost on ignition.....	21.23
Siliceous matter insol. in H. Cl.....	8.72
Sulphuric Acid.....	0.30
Phosphorus.....	0.03
<hr/>	
Metallic Iron, in raw ore.....	36.34
Metallic Iron, in calcined ore.....	49.90

"A small quantity of iron is present as peroxide, in each ore, but I have not thought it necessary to make a separate estimation of this.

"It would appear that the iron ores of this formation rank high in the class to which they belong, and that if occurring in sufficient quantity, they might eventually become of great economic importance. I have not seen, however, in the vicinity of the Line, any place in which they are so abundant as to warrant the hope of the profitable production of iron. In some localities, great surfaces are more or less thickly covered with nodules which have



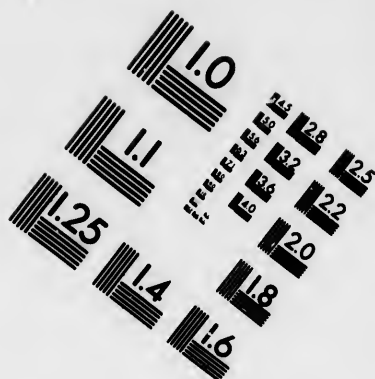
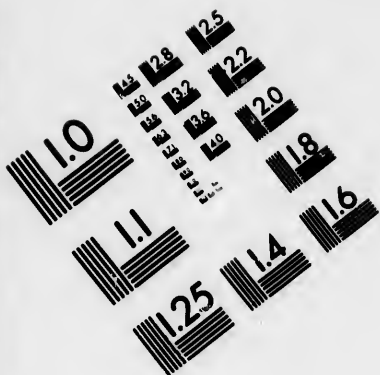
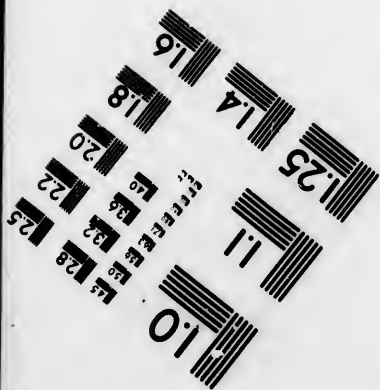
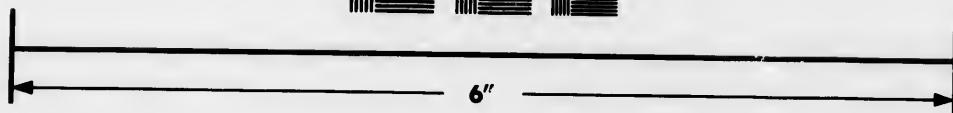
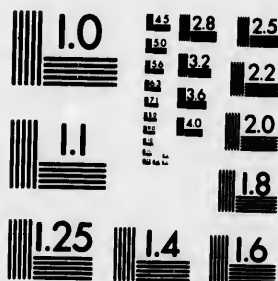


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been left behind by the erosion of the containing rocks; and it is, of course, possible that further search may lead to the discovery of sections in which so many bands occur, as to render it profitable to work over the entire bank for their extraction.

If the manufacture of iron is ever to be carried on on a large scale, for the supply of the interior region of the continent, it will naturally be conducted towards the base of the Rocky Mountains. There the fuels are better suited for this purpose, and ironstone probably occurs quite as abundantly in the formation. There, too, it may be confidently expected that search will bring to light deposits of the richer classes of ores, among the palæozoic rocks of the mountains.

Gold, in small quantities, has been obtained, both above and below Edmonton, on the North Saskatchewan. It is found amongst the sand and gravel of the river bed, at the lowest stage of the water. Experienced miners make fair wages for a few weeks, before the setting in of winter, but, in no case, has a sufficient amount been realized to warrant the belief that large deposits exist. The gold is exceedingly fine, and seems to be deposited every season, as the same bars will produce a small quantity of it each year.

That found on Peace River is of the same character, and occurs in the same situations, but in much greater quantities. This remark applies only to that part of the river west of the Rocky Mountains. Without gold in greater quantities and in more accessible situations can be obtained by those who seek for it, this industry will never be profitable in the North-West.

Up to 1873 brickmaking was never attempted in Manitoba. During the summer of that year a beginning was made to manufacture them, but the success of the experiment was very indifferent and many prophesied the failure of the enterprise. Other attempts were made next year with the most gratifying success, and since then no difficulty has been

experienced in producing not only a good but very superior article. At Emerson, Portage la Prairie, Rapid City, and all other points good brick have been produced, and now it is a well ascertained fact that in every district brick clays abound.

Besides its superior soil the North-West contains enormous deposits of coal underlying at least 150,000 square miles of surface. Immense deposits of salt exist on Lakes Manitoba and Winnipegosis, and on Salt River in the vicinity of Great Slave Lake. Numerous petroleum springs are seen for many miles along the Athabasca; and gold and iron in some abundance in certain parts of the country, so that, altogether, we are safe in saying that our vast interior is rich in those minerals which add most to the comfort and wealth of civilized man.

CHAPTER XXIV.

History of the North-West, from the discovery of America to the year 1821.

First Voyage of Jacques Cartier—What he Intended Doing—Second Voyage—The Discovery of the St. Lawrence—Montreal Reached—Roberval's Attempt at Settlement—His Want of Success—Champlain Founds Quebec, in 1608—Interferes in Indian Quarrels—Lake Superior heard of, in 1615—Missionaries Traverse its Shores, 1641—Frenchmen Cross by the Dawson Route and Lake Winnipeg to Hudson Bay, in 1666—Offers of Service to the Quebec Merchants, Renewed in Paris, Accepted in England—Gillam's Voyage—Formation of Hudson's Bay Company, in 1670—Establishment of Forts on the Bay—Quarrels with the French—English Left in Possession of the Bay—French Trade Extended Westward—Duluth on Lake Superior—Red River Reached and Forts Erected, 1732—Fort a la Corne Reached, before 1763—Cession of the Country—Canadian Traders in the West—Hudson's Bay Company move Inland, in 1774—Canadians in the Interior Nearly 100 years Before them—The Athabasca Reached by the Canadians—Hudson's Bay Company Reach Red River, in 1793—The Trade open to all Parties—Formation of the North-West Company, 1783—Fort William, on Lake Superior, their Head-quarters—Quarrels with the Hudson's Bay Company—Lord Selkirk Buys Shares, gets Control of the Concern, Obtains a Grant of Land, and Attempts Settlement—The North-West Company Deny his Right to the Land, and Claim Prior Rights—They publicly state their Determination to Fight—Counter Preparations by the Hudson's Bay Company—Settlers Leave for Canada, in 1815—Arrival of Governor Semple—Preparations to Expel the North-West Company—Both Sides Prepare for War—Forts Gibraltar and Pembina Taken by Semple—North-West Property Confiscated—Red River Blockaded—Attempt to Provision the Boats—Governor Semple Interferes and Loses his Life—Hudson's Bay Company Account of the Fight—Opposite Account—Apathy of the British Government before the Fight—Warned Repeatedly by the North-Westerns—Lord Selkirk's Preparations—Takes Possession of Fort William—The Colony Re-established in 1817—Troubles with the Grasshoppers—Union of the Companies, in 1821.

In the spring of 1534 Jacques Cartier, an able and experienced seaman of St. Malo, was sent out by Francis I. of France to explore the northeast coast of America, and if possible find a route to India, which at that time attracted the attention of the mercantile world. In the latter part of the preceeding century Columbus and Cabot had made their celebrated voyages, and Spanish adventurers were now engaged in overthrowing the old empires of the southern

part of the continent. Unlike the Spanish, the English made no attempt to follow up the discoveries of Cabot, and at the time of Cartier's voyage still reposed on their laurels as the discoverers of the American continent. Prior to his voyage, in the year 1534, he had sailed along the coast from Carolina to the northern part of Nova Scotia.

Cartier's intention seems to have been either to strike the coast north of this, or find the passage so anxiously sought for. Entering the Gulf of St. Lawrence he passed between the Magdalen Isles and crossed to the Bay of Chaleurs. Landing on its shores he took possession of the surrounding country in the name of the King of France. While at Gaspé he took on board two Indians and sailed for France. Although close to the entrance of the St. Lawrence he does not seem to have recognized the existence of the river, but learned it from the Indians he carried away.

In May, 1535, he again set sail and crossed the Gulf of St. Lawrence, piloted by natives of the country, possibly those he had taken away the preceeding year. After a voyage of some length he reached the Island of Orleans, where he got supplies of Indian corn, fish, and fruits. He next visited Stadicona (now Quebec), and pushed on with part of his men to Hochelaga, on the same island where Montreal now stands. After ascending to the summit of the mountain on the island, and viewing thence a great extent of country, he gave the hill the name of Mount Royal, which has now become Montreal. Returning to the mouth of the St. Charles, where he had left his men, he prepared to winter at that point. During the winter, scurvy in its most malignant form broke out amongst them, and one-quarter of his ships' companies died. On the return of spring Cartier sailed for France, taking with him Danacona the king of the country.

The Sieur de Roberval, a nobleman of Picardy, having obtained a commission from the king and liberty to establish

a permanent colony in the country, sent out Cartier with the colonists in 1541. He attempted to get up the Lachine Rapids, but failed, and then turned his attention to wintering in the country. In the spring he embarked his colonists for France, and meeting Roberval coming out with a larger band the two disagreed, Cartier going on to France and Roberval proceeding on his voyage. Various causes prevented the complete establishment of the colony, and Canada seems to have been almost forgotten for over fifty years.

Acadia (Nova Scotia) had been attracting some attention during this time, but in the year 1607 the *Sieur de Monts* abandoned Acadia and turned his attention to Canada. The next year his Lieutenant, Champlain, laid the foundation of Quebec and the first permanent settlement was formed. At this time the Algonquins were engaged in a deadly struggle with the Iroquois confederacy. The former applied to Champlain for assistance, which was readily granted, and in 1609 the French and their allies had their first fight with the Iroquois. Firearms settled the question, and the red man fell before the murderous weapon. This one act of Champlain brought untold woes upon the French colonists in future years.

During the summer of 1615 Champlain ascended the Ottawa and crossing to Lake Nipissing, passed down French River to Lake Huron. While on this expedition he heard of Lake Superior; but it was twenty-six years after this before a Frenchman launched his canoe on the Great Lake. Two missionaries of the Society of Jesus reached the lake in 1641, or just 100 years after the first attempt at settlement.

Twenty-five years later, or in 1666, two French gentlemen, De Grosselier and Raddison, passed around Lake Superior, ascended the Kaministiquia, and crossed to the waters of Rainy River, down which they floated to the Lake of the Woods. Following Winnipeg river to its outlet in

the lake of the same name, they turned north and descending the Nelson from Lake Winnipeg to Hudson's Bay, demonstrated the existence of a water route from Lake Superior to Hudson's Bay. Before this there is no doubt but that traders had penetrated far to the north by the Ottawa and other streams, and possibly had reached the Bay. The Assiniboines seem to have been well acquainted with the route, for history informs us that they conducted these gentlemen from Lake Superior to the sea, and brought them back in safety.

On their return to Quebec they offered to conduct ships into Hudson's Bay, and by this means reach the heart of the "Fur Countries" by water, and save the canoe route by Lake Superior. Their proposal was rejected, and a subsequent one to the French Government met the same fate. While in Paris they met the British Ambassador, who advised them to go to London. Here they were favorably received by a number of merchants and persons of standing, and a Mr. Gillam, connected with the Newfoundland trade, was commissioned to prosecute the discovery.

Mr. Gillam sailed in the *Nonsuch*, ketch, in 1667, into Baffin's Bay, to the height of 75° north, and from thence southward to 51°, whence he entered a river, to which he gave the name of Prince Rupert's, and, finding the Indians friendly, he erected a small fort. The persons interested in this vessel, upon the return of Gillam, applied to Charles Second for a Patent, who granted them the Hudson's Bay Company's Charter, dated the 2nd May, 1670.

In the same year a Mr. Bailey was sent out as Governor and established Forts Rupert and Nelson. By the year 1686 the Hudson's Bay Company had increased their establishments to five, viz., Albany, Moose, Rupert, Nelson, and Severn. Already the French disputed their claim to sovereignty. In 1682 the Hudson's Bay Company took possession of Nelson River, and shortly after the French reached St. Therese

or Hayes River. During the next four years there were constant disputes, and in 1686 the Chevalier de Troyes, in time of peace, took possession of the forts on James' Bay, viz., Rupert, Moose, and Albany Factories. All the forts were captured and retaken in succeeding years.

The treaty of Ryswick was signed in 1697, and left the French in possession of all forts on James' Bay, except Albany. During the next seventeen years an inconsiderable trade was carried on by the English. By the Treaty of Utrecht all the territories on the Bay were ceded to them. The tenth article of the treaty ceded all the lands and forts on the Bay to Queen Anne, but expressly stipulated that the "Company of Quebec and all other subjects of the Most Christian King whatsoever, could go by land or by sea, whithersoever they pleased." A wooden fort was erected at the mouth of the Churchill in 1718, and named Fort Prince of Wales. Twenty-four years later we find the English ascending the Albany River and building a trading post 150 miles from the coast to serve as a check to the Indians who were in the habit of ascending that river to meet the French traders.

Daniel Greysolon du Luth, in the year 1678, built a small house at the mouth of the Kaministiquia and traded with both the Dacotahs and Assiniboines, and deservedly the first city at the head of the lake was named in his honor. Some Montreal merchants formed a company in the year 1731 and sent M. Verendrys and Père Messenger as their agents to Lake Superior. They were instructed to explore the country, and try if possible to connect Canada with Louisiana by the Mississippi route. Pushing west by what we now call the Dawson route we find them building Fort St. Charles on the Lake of the Woods in 1732. Following down the Winnipeg River they erected Fort Maurepas on that stream in 1734, and Fort Rouge at the forks of the Assiniboine and Red Rivers. They now ascended the Assiniboine River to

Portage la Prairie and crossed over to Lake Manitoba, where they erected two forts, Fort Dauphin at the head of Lake Manitoba and Fort de la Reine at its foot. Proceeding westward they discovered the Swan and Red Deer Rivers, and erected a fort at the head of Cedar Lake, which they named Fort Bourbon. They now entered the Saskatchewan and proceeded up the River to the forks, below which they built their last fort, which they named Fort à la Corne. This was the most western point reached by the French prior to 1763.

Four years after the cession of Canada to England, numbers of British born subjects entered into the fur trade, and established their headquarters at the mouth of Pigeon River on Lake Superior. Thomas Currie wintered at the west end of Cedar Lake, in 1767-68. In 1775, Mr. Frobisher, by pushing north from Cumberland House, intercepted the Indians on their way to Churchill to trade with the Hudson's Bay Company, and obtained all their furs, by the one venture clearing \$50,000. Next year, his brother penetrated to Isle la Crosse, and met the Indians still nearer their winter quarters. In the spring of 1778, a number of the Saskatchewan traders put their goods into a common stock, and placed Mr. Peter Pond in charge of them, directing him to proceed to the Athabasca and trade with the Indians. He took the present Hudson's Bay Company's route, by Cumberland House, Frog Portage, Isle la Crosse, and on to the Methy Portage and down the Clearwater River to the Forks of the Athabasca. Here he built a house, and in the spring of 1779, planted garden seeds. Ninety-six years after, I visited the same neighborhood, and Pond's location was pointed out to me.

As soon as the Hudson's Bay Company found that the Canadians were cutting off their trade from Churchill, they set about to restore it. They were compelled to carry the goods to the Indians, instead of seeing the Indians coming to the goods. In 1774, Mr. Herne, the discoverer of the Coppermine River, was sent inland to establish a trade with the

Indians. He located on Pine Island Lake and built Cumberland House, from which point all supplies were passed into the north for the next hundred years. It was only in 1793 that the Hudson's Bay Company's servants reached Red River. Pushing up the Assiniboine, they built their first fort at the mouth of the Souris.

After the cession of the country, in the year 1763, large fortunes were made by individuals, who penetrated the Indian country for the purpose of trade. Large numbers engaged in the traffic, and their mutual bickerings caused so much ill feeling, that many of the leading merchants refused to supply any more goods. During the winter of 1783-84, these merchants formed a company under the name of the North-West Company. One of the leading articles of the agreement was, that the small capital of each should be thrown into a common fund, and each should share the profits according to the amount invested. After a few years, a large number of traders seceded from the North-West Company, and formed a new one, known in Canada as the X. Y. Company. In the year 1805, a coalition was formed, and these two became one strong Company. It was now divided into 100 shares, partly held by capitalists in Montreal and London, and partly by men in the trade, called "Wintering Partners." Fort William, near Thunder Bay, was considered the seat of power, and here the partners met every year to consider the affairs of the Company.

After the formation of the new Company, the trouble between them and the Hudson's Bay Company broke out into open violence, and murder and robbery were of frequent occurrence. At this time, Lord Selkirk visited Montreal, and there learned enough to satisfy him, that rich and fertile lands existed on the banks of the Red River. On his return to England, he had some conversation with Sir Alexander Mackenzie, and they both decided to buy Hudson's Bay Company's stock, which had fallen from 250 to about 60.

No dividend had been paid for a number of years, and everything was falling into decay. Shortly after this, Lord Selkirk bought out Sir Alexander, and thus became possessed of forty per cent. of the stock. The next step was the placing of a number of Lord Selkirk's friends on the Directorate. In May, 1811, a "General Court" was convened by public notice, and the "Proprietors were informed that the Governor and Committee considered it beneficial to their interests to grant in fee simple, about 116,000 square miles of what *was supposed* to be their territory, on condition that he should establish a colony on the grant." All present, except Lord Selkirk and the Committee, objected to this and signed a protest, but notwithstanding the grant was confirmed, and Lord Selkirk became the "ideal proprietor" of an immense territory.

The North-West Company promptly "denied the right, either of the Hudson's Bay Company or Lord Selkirk, to *any part* of the territory ceded to him," claiming that they and their predecessors had been in occupancy for at least a century. This claim is undoubtedly true, as it was a well ascertained fact that the French colonists formed the "Beaver Company," in 1630 and traded in the country before the grant was made by Charles II, in 1670. Even the terms of the grant denied the pretensions now set up, for it explicitly stated that:—"The grant only applied to countries not occupied or discovered by the subjects of any other Christian Prince or State." The Canadians to a man were opposed to the grant, on the ground of its illegality as a matter of law, and further, that the Grantors could not give what they did not possess. To us, at this date, it is simply ridiculous to read that the land granted extended from the southern end of Lake Winnipeg, as far south as lat. 46°, fully 200 miles into the United States. Furthermore, the North-West Company stated that they would not recognize in any sense the exclusive right of trade, or jurisdiction claimed

by the Hudson's Bay Company, and that they would resist all attempts to seize either their persons or property, or to dispossess them of their trade.

Lord Selkirk was not to be deterred by these threats, but in the spring of 1811 the first instalment of twenty-five families was sent out in the Hudson's Bay Company's ships. This company passed the winter at York Factory and in the spring of 1812 started for Red River, which they reached too late in the season to do much. In the spring of the next year some farming was attempted, but seed was scarce and little was raised. Early in the winter, a large accession of immigrants arrived and the prospects of the settlement began to brighten. Other settlers came in during the summer of 1814 and Mr. Miles Macdonell, Lord Selkirk's deputy, who had previously trained his men to the use of arms, issued the following proclamation.—:

“DISTRICT OF OSSINIBOIA.

To Mr. Duncan Cameron, acting for the North-West Company at the Forks of Red River.

Take notice, that by the authority and on behalf of *your landlord*, the Right Honorable Thomas, Earl of Selkirk, I do hereby warn you, and all your associates of the North-West Company, to quit the post and premises you now occupy at the Forks of Red River, within six calendar months from date hereof.

Given under my hand at Red River Settlement, this twenty-first day of October, 1814.

(Signed) MILES MACDONELL.”

Proclamations similar to the above were posted throughout the country, and it became abundantly evident that the Hudson's Bay Company were in earnest. During the winter dissatisfaction began to show itself in the colony and numbers of settlers applied to the North-West Company

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for assistance to leave the country. It is extremely probable, that Mr. Cameron, if not the originator of this movement, assisted the malcontents very much. In the spring of 1814 a large quantity of provisions had been taken by force from a fort of the North-West Company at the mouth of the Souris, and for this a warrant was issued against Messrs. Macdonell and Spencer his Sheriff. The one was indicted for issuing a warrant and the other for executing it. Mr. Spencer was arrested early in the winter and sent to Rainy Lake.

On the approach of spring, 1815, the settlers took refuge in the North-West Company's Fort, taking with them the cannon and ammunition of the Hudson's Bay Company at the same time. The "Free Canadians" and Half-breeds were now aroused, and Mr. Macdonell quietly gave himself up. After the surrender of Mr. Macdonell the settlers came in a body to Mr. Cameron and asked to be taken out of the country. He acceded to their wishes, and fifty families were brought to Little York (Toronto). About two-thirds of the settlers having left for Canada, the other third left the Forks and proceeded north to Lake Winnipeg for the purpose of leaving the country by Hudson's Bay.

During the preceding winter (1814-15), Lord Selkirk had not been idle and had sent out two expeditions, one by way of Montreal, and the other under Governor Semple by Hudson's Bay. Mr. Robertson, who came by Montreal, arrived first at Red River and remained with the settlers whom he found near Lake Winnipeg. Mr. Semple, with another contingent of settlers, arrived at Red River in September, 1815, and re-established the colony.

In order to force the North-West Company to leave the country, or acknowledge Lord Selkirk's supremacy, a regular attack by armed men was made on Fort Gibraltar on the night of the 17th of March, 1816. The fort was taken, and Mr. Cameron and his people were made pri-

soners. Three days after, the fort at the mouth of the Pembina was attacked and taken, and all the occupants made prisoners. Every thing in the shape of goods, furs, papers, and ammunition was confiscated for the use of Lord Selkirk. The two forts were levelled to the ground.

An attack was made on Fort Qu'Appelle near where Fort Ellice now stands, which proved unsuccessful, Mr. Alexander Mackenzie, the gentleman in charge, beating off the attacking party. A large stock of provisions was laid up here for the use of the North canoes, and had these fallen into Governor Semple's hands, the North-West Company would have been starved out. As the North canoes were daily expected, Mr. Semple took measures to prevent them ascending Red River by building batteries on the banks and stationing a small gunboat on Lake Winnipeg.

The North-Westerners had not been idle, but had retaliated when they had opportunity. An attempt was made to carry provisions from Fort Qu'Appelle to Lake Winnipeg, and an escort of fifty Indians and Half-breeds was sent with the provisions. They were instructed to keep away on the prairie so as to pass Mr. Semple's Fort (Fort Douglas), without being seen. After they had passed the Fort, Governor Semple, seeing, by means of a telescope from a lookout on the top of his fort, the circuit made by the Indians and Half-breeds, determined to intercept them.

The following is Mr. Pritchard's account of the fight, and it may be considered the Hudson's Bay Company's version :—

“On the afternoon of the 19th June, a man in the watch-house, called out that the Half-breeds were coming. The Governor, some gentlemen, and myself looked through spy-glasses and saw distinctly some armed people passing along the plains. A man then called out, “they” (meaning the Half-breeds), “are making for the settlers;” on which the Governor said, “we must go out and meet these people, let twenty men follow me.” We proceeded by the old road

leading down to the settlement. As we were going along we met many of the settlers running to the fort, crying "the Half-breeds, the Half-breeds." When we were advanced about three quarters of a mile along the settlement, we saw some people on horseback behind a point of woods. On a nearer approach the party appeared to be more numerous, on which the Governor made a halt and sent for a field piece, which, delaying to arrive, he ordered us to advance. We had not proceeded far before the Half-breeds on horseback, with their faces painted in the most hideous manner, and in the dress of Indian warriors, came forward and surrounded us in the form of a half-moon. We then extended our line and moved more into the plain, and as they advanced, we retreated a few steps backwards and then saw a Canadian named Bouchier ride up to us waving his hand, and calling out, "What do you want?" The Governor replied, "What do *you* want?" To which Bouchier answered, "We want *our* Fort," to which the Governor said, "Go to your Fort." They were by this time near each other and consequently spoke too low for me to hear. Being at some little distance to the right of the Governor, I saw him take hold of Bouchier's gun and in a moment a discharge of fire-arms took place; but whether it began on our side or by the enemy it was impossible to distinguish. My attention was then directed towards my personal defence. In a few moments, almost all our people were killed or wounded. Captain Rogers having fallen, rose up again and came towards me, when, not seeing one of our party that was not either killed or wounded, I called to him, "For God's sake give yourself up." He ran towards the enemy for that purpose, myself following him. He raised up his hands, and in English and broken French, called out for mercy; a Half-breed, son of Colonel William McKay, shot him through the head, and another ripped open his belly with a knife while uttering the most horrid imprecations. Fortunately for me,

a Canadian named Lavigne joined his entreaties with mine and saved me, though with the greatest difficulty, from sharing the fate of my friend at that moment. I was rescued from death, in the most providential manner, no less than six times, on my road to and at the Frog Plain, the headquarters of these cruel murderers. No quarter was given to any of the party, except to myself. The knife, the axe, or the ball put a period to the existence of the wounded; and such horrible barbarities were practiced on the bodies of the dead as characterize the inhuman heart of the savage. The mild and amiable Mr. Semple, lying on his side, his thigh broken, and supporting his head on his hand, addressed the chief commander of our enemies by inquiring if he was Mr. Grant, and being answered in the affirmative, said, "I am not mortally wounded, and if you could get me conveyed to the Fort, I think I would live." Grant promised to do so; and immediately left him in the care of a Canadian, who afterwards told me that an Indian of their party came up and shot Mr. Semple in the breast. I entreated Mr. Grant to procure for me Mr. Semple's watch or seal for the purpose of transmitting them to his friends, but I did not succeed.

"Our force amounted to twenty-eight men, of whom twenty-one were killed and one wounded. These were Governor Semple, Captain Rogers, Mr. James White, Surgeon; Mr. Wilkinson, private Secretary to the Governor; Lieutenant Holt, of the Swedish navy, and Mr. Alexander McLean, a settler, with fifteen laboring men. J. J. Bourke was wounded in his retreat to the Fort. The enemy, I am told, were sixty-two in number, the greater part of whom were the regularly engaged clerks and servants of the North-West Company. They had one man killed and another wounded. On the field I saw six of the North-West Company's Canadian servants, viz.: Bouchier, Morin, Deschamp, Joseph Hesse, Magian, and Lavigne."

We shall now give the North-West Company's version of the affair at the Seven Oaks, which is corroborated in almost every particular by the settlers who were in the colony at the time. This version states, that on meeting the Hudson's Bay men, the Half-breeds sent one of their number, a Canadian named Bouchier, who spoke English, to enquire of the Governor, his object in pursuing them in a hostile manner. Bouchier rode up to the Governor, and some words passed between them, upon which Mr. Semple took hold of Bouchier's horse by the bridle, disarmed him and ordered him to be taken prisoner. Bouchier attempting to escape, the Governor ordered his men to fire immediately at him; and when his people hesitated, because of the danger they would incur in such a conflict, he was more peremptory in his commands, accusing them of cowardice for not immediately obeying him. His orders were at last obeyed by some of his party, and of the shots fired, one grazed Bouchier's ear in his flight, and another passed through the blanket of an Indian advancing in the attitude and with the language of friendship. Seeing himself thus treacherously assaulted, the Indian levelled his gun and fired in return, which example his party followed, and the melancholy result of the conflict was that the Indians rushing in, Mr. Semple and about twenty of his people lost their lives, One Half-breed and an Indian were killed on the other side.

Both parties seemed to feel that a crisis was approaching in 1816. Lord Selkirk arrived in Montreal, in the fall of 1815, and at once commenced to enlist men for service in the interior, but to the world generally he referred to them as settlers on his Red River Lands. The war had ended between the United States and England, and the two regiments, De Meuron's and De Watteville's, were disbanded. About 140 men belonging to these regiments were enlisted, and with all the pomp and circumstance of war they started in canoes from Lachine.

During the winter, the North-West Company offered to enter into terms of union with Lord Selkirk, but he paid no attention to them. Feeling assured that his intention was to crush them, they appealed to the Government, and in a letter written to the Secretary of State, on February 1st, 1816, occurs this passage :—

“ We do not presume to point out the particular proceeding which, in this case, would be satisfactory to ourselves. Our sole object is to put an end to violence and bloodshed, and we are perfectly satisfied that, in the discussion to which such proceedings must give rise, the interests of His Majesty’s Canadian subjects will, at least, meet with as favorable consideration as those of their opponents.”

Again we find them applying to the same official, in a letter dated March 1st, 1816, in which they say :—

“ We do not venture to suggest the remedy it may be in their power, or may appear eligible to His Majesty’s Government to provide in this case, but we are certain if some measure be not adopted to define, without delay, the limits, power, and authority of the Hudson’s Bay Company, a contest will ensue in the interior, the results of which will be dreadful with respect to loss of lives and property.”

They also enclosed the correspondence which passed the preceeding winter between their agents and Lord Selkirk. The Government were slow to act, and paid no heed to their appeals. In the meantime, his Lordship had got himself appointed a Justice of the Peace for the Indian Territories and Upper Canada. A military escort, under the name of a body-guard, consisting of a Sergeant and detachment of the 37th Regiment, were also given him. In the instructions to this guard, it was distinctly stated that they were to interfere with neither party in their quarrels, as both parties had *equal* rights in the country.

After a careful examination of all the material at hand, I can only come to the conclusion—that both parties were

lawless, that each of them was determined to wipe out the other, and that each was willing to use the Indians and Half-breeds to carry out its purposes. Lord Selkirk, who was not a fur-trader, wished to settle the country and encourage agriculture, while the North-West Company desired to preserve the fur-trade.

Miles Macdonell, who had gone up to Red River in the spring, reached there a few days after the fight, and at once returned with the news to Lord Selkirk, whom he met at the entrance to Lake Superior. On receipt of the news, Lord Selkirk immediately headed for Fort William, the headquarters of the North-West Company, where he seized everything in the Fort, and converted it to his own use. Besides appropriating the goods, he took all the officers prisoners, and in every way conducted himself as a conqueror. During the winter the Fort, on Point Douglas, was surprised, and again Lord Selkirk reigned at Red River.

After the fight, in June, the settlers retreated to Jack River at the foot of Lake Winnipeg. They remained there until the spring of 1817, when an express arrived with the news that the fort was taken and they were invited to return. In hopes that peace might finally be established, they retraced their steps and commenced work anew, but there was not a plough in the colony, and all the work had to be done with the hoe.

His Lordship now set to work to consolidate the colony, and in August, 1817, each of the settlers obtained his land. The settlement was named Kildonan, after their old parish in Scotland. Peace had now been ratified by the Imperial Commissioners, and the people thought their troubles at an end; but on the 18th of July, 1818, clouds of grasshoppers settled down on the colony and ate up every green thing. Again they had to retreat to Pembina where they had lived the preceeding winter, and to hunt the buffalo for their subsistence. Farming was tried in the spring of 1819.

but again the crops were eaten up by grasshoppers. Many of the young men had now become good hunters, and no fears were felt when they saw their hopes blasted for another season. Retreating once more to Pembina, they subsisted by the chase all winter and laid up a store of food for the coming summer. The country still being alive with grasshoppers no land was cultivated in 1820, and all lived on the products of the chase, or upon fish caught in the rivers or lakes. In February 1821, a party started for Prairie du Chien, under the command of a Mr. Laidlaw, and purchased 250 bushels of wheat. This they loaded on flat boats, and when the ice left the Red River in spring, floated it down to the colony. This was sown and a good crop followed, and the food troubles of the Red River settlements were at an end.

Both parties now began to see the error of their ways, and negotiations were entered into which terminated with the amalgamation of the two companies in the year 1821. Up to the time of the union the greater part of the exploring and mapping out of the country was done by the North-West Company, and no matter what may be said to the contrary, the honor of exploring this country to the Pacific belongs to Canadians. Thompson, the geographer of the Company, named and laid down many rivers, and gave us our first knowledge of British Columbia. Others navigated the Fraser and Columbia, established posts on both rivers, traded with Japan and China, and sent vessels round Cape Horn.

By the co-partnership entered into (March 26th, 1821,) it was agreed that forty shares of the one hundred, into which the company was divided, should belong to the North-West Company, and sixty to the Hudson's Bay Company. This agreement was to continue for twenty-one years. In 1834 this agreement was re-affirmed and it was decided to continue it for an unlimited period.

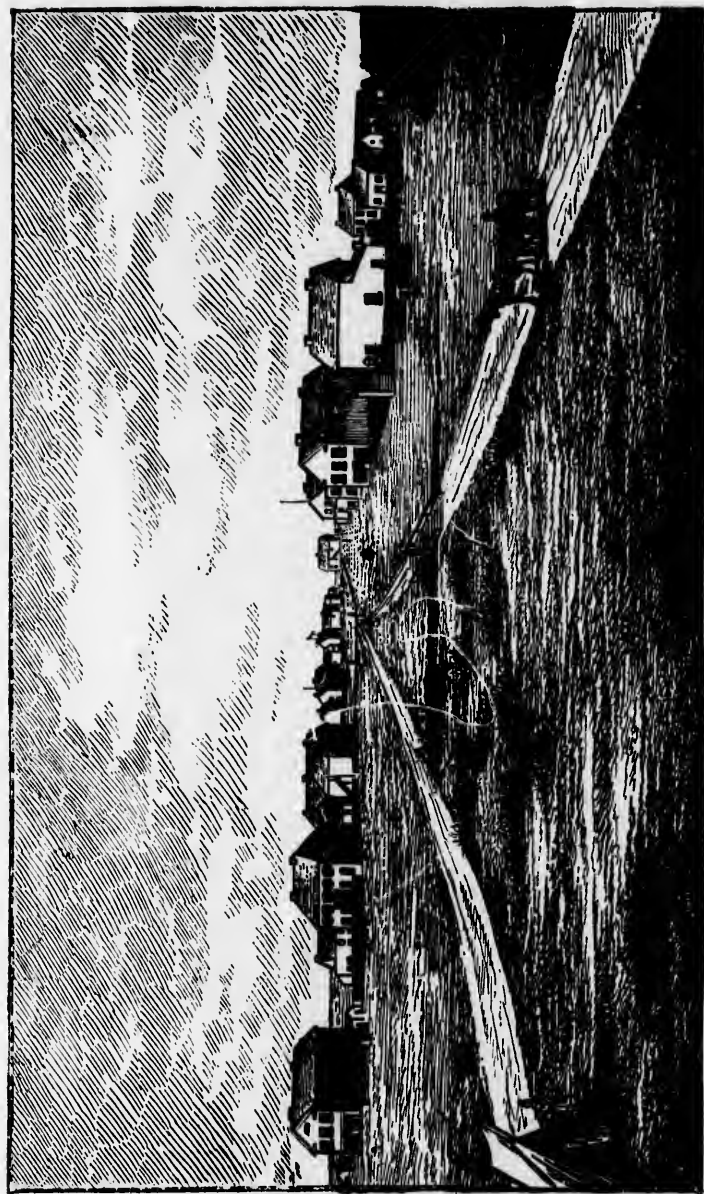
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CHAPTER XXV.

History from 1821 to 1870.

Arrival of the Swiss—Settlement of the old Hudson's Bay Company's Servants—Terrible Winter of 1825—Disastrous Flood of 1826—Emigration of the Swiss—Red River Colony Prosperous—Sir George Simpson's Policy—Attempts at Various Industries—Sheep Farming—Cause of Failure—Lord Selkirk's Title to the Land Reverts to the Hudson's Bay Company—Farming Tried on a large Scale—Schools Established—Everything Done to Prevent Successful Farming—Half-breeds Frighten the Company—The Council of Assinibola Formed—Duty Imposed on Imports and Exports—Regulars Sent into the Colony—People Petition for their Rights—They take the Law into their Own Hands and Trade becomes Free—Red River Flood of 1852—Captain Palliser's Expedition—Expedition under Dawson and Hind—Arrival of Dr. Schultz—The *Nor-Wester* Established—Hudson's Bay Company's Opposition—The Dominion Established—A Demand made for the North-West Territories—Country Systematically Be-littled—Bishop Taché's Book—He sees no Good in the Country—Purchase of the Territory—Steamboat on Red River—Dr. Schultz Imprisoned—The Power of the Company Broken—Portage la Prairie—Grasshopper Plagues—Canada Takes Steps to Acquire Possession of the Country—Conflicting Interests—Mutterings of the Storm in the Fall of 1869—The Claims of the French Half-breeds—Surveyors Stopped by Louis Riel—Hudson's Bay Company and Roman Catholic Fathers Decline to Interfere—An attempt at Independence—Fort Garry given up to Riel—Governor McTavish's Explanation—His Evident Complicity with the Rebels Almost Admitted—His Child-like Simplicity—O'Donohue Joins the Rebels—He Introduces the Fenian Element—His Letter to the Canadian Government—Bill of Rights drawn Up—The Movement is seen in its proper Aspect—Canadians Attempt to break Riel's Power—Their Imprisonment—Murder of Scott—Arrival of Bishop Taché—Riel changes from a Wolf to a Lamb—Fenian Flag Pulled Down—Arrival of Colonel Wolseley with his Troops, and Flight of Riel and Lepine—Conclusion.

A NUMBER of poor Swiss were brought to the colony in the fall of 1821, but these being altogether unacquainted with manual labor suffered severely. Before they reached the colony winter had set in and they suffered frightful hardships while on Lake Winnipeg. When they arrived food was very scarce, and in December a move was made to join the hunter's camp beyond Pembina. Being without either horses or dogs they harnessed themselves to the sleds and drew their children and household effects the whole distance. Spring found all at work and a larger

area was planted than ever before. Good crops followed and all had abundance of food.

After the union of the two companies a number of the old servants either left the service or were dismissed. Most of these men had wives and families, and therefore resolved to settle in the country. A survey of the "River Lots" had been made in 1822 by a Mr. Kemp, and at this time all lots were reduced to eight chains frontage and extended back 160 chains to the rear, each lot containing 128 acres. Laborers were entitled to one lot each, and other servants according to their standing. By this influx of settlers the colony was more than doubled and the area of the settlements widely extended.

"The Swiss, in 1821, settled among the De Meurons, on the Rivière la Seine, which takes its rise in the forests to the east, and falls into the Red River about a mile below the confluence of the Assiniboine River with the latter. Others of the Swiss had settled on the Red River above the Forks. The refugees from Pembina squatted down near the Swiss. The Scotch occupied what is now divided into the Parishes of St. John and Kildonan. The Protestants arriving in the settlement extended down along the Red River, and occupied the Parishes of St. Paul and St. Andrew." * As time passed the French Half-breeds came in from the Saskatchewan, and settled on the Lower Red River and at White Horse Plains.

The fall of 1825 was ushered in by a cold and wet September, followed in October by heavy snow, which covered the plains to a great depth. In December a terrible snow storm came on, which lasted three days and four nights, and drove the buffalo far to the south. The plain hunters prior to this had been in great distress, owing to the depth of snow and the weakness of their horses. This storm deprived them of food, and they at once commenced to make their way to Pembina. Rumors reached the post

* Gunn's History.

that the hunters were starving, and steps were immediately taken to render assistance. Men were despatched with provisions over the snow covered plains, and many were rescued when at the last extremity. Before assistance could be rendered to all, not less than thirty men, women, and children perished in the snow from hunger and cold.

As soon as the weather turned warm, the river began to rise, and by the 2nd of May, the accumulated waters had overflowed the banks and began to submerge the surrounding country. Before the day closed, the entire district was changed into a huge lake, and most of the settlers had deserted their homes. At the Forks of the Assiniboine and Red River (Fort Garry), the river rose nine feet in twenty-four hours. By the 21st of May, the waters were sixteen feet above high water mark, and the Red River Plain was a vast lake. The flood, after this date, began to subside, and by the middle of the month of June, the waters had left the land, and the inhabitants returned to their desolated homes. In too many instances the sites only remained, as the houses had disappeared in the flood. Scarcely allowing the land to dry, the settlers went to work with a will, and sowed wheat and barley, and planted potatoes, all of which came to maturity, though planted after the 20th of June.

The Swiss and De Meurons, having become disgusted with the country, determined to go to Fort Snelling, in the United States. On the 24th of June, the emigrating party to the number of 243 started on their arduous journey. They reached their destination in safety, and the Swiss settled down on the Upper Mississippi and became prosperous.

The Red River Colony prospered during the next few years, and far more grain was produced than was required in the country. Up to 1832, the Hudson's Bay Company brought in all the goods, but about this time, a few private gentlemen began to bring in goods, which they sold to the

settlers at a handsome profit. Seeing this, the Company changed their tactics and encouraged agriculture, promising a market for everything produced. At first, land was sold for five shillings per acre, but now it was increased to seven shillings and six pence, and was difficult to obtain. In a short time, the settlers had a large surplus on hand, and Sir George Simpson saw it was time to put a price on farm produce. Convening a mercenary and subservient Council, he had his regulations passed, and at one sweep prices fell from 100 to 300 per cent. All the articles required by the settlers remained as they were, and the people grumbled long and loudly over the change, but had to acquiesce.

Various attempts were made to establish industries other than farming, but from one cause or another they failed. The growing of flax and hemp was tried and succeeded remarkably well, but the settlers being ignorant of its after management very little of it was utilized. A cattle farm on a large scale was next attempted, but this too proved a failure, as the severe weather, want of proper care, but principally the wolves, which then abounded, decimated the herd, and that business was given up. Sheep farming on an extensive scale was next attempted, and as the experiment is one that has been spoken of to prove the unsuitableness of the country for such occupations, I give it in the words of a late author. The sheep were purchased in Kentucky, and what follows took place on their way to the Red River Settlement. It will be seen that the reference to the grass with "barbed spines" wholly refers to Dakota, as it was in passing through that State the sheep died. The story with many embellishments has been transferred to our North-West, and is used by many as a reason why sheep farming will not pay. It is quite evident that the grass was made to do duty to cover the brutality of the parties in charge who condemned every sheep to death when it showed any signs of exhaustion.

"After a variety of adventures and loss of time the party reached Kentucky, and found that the price of sheep there differed very little from what they could have bought them at in Missouri, being from five shillings to seven shillings a head. Here the number acquired were, 1,475, but on the way back they began to meet with the difficulties that the sagacious Bourke foresaw and foretold. They had to pay for pasture every night and whenever they halted during the day, besides many sheep died from the effects of hard driving. On their way up the Mississippi they gave another instance of the wisdom of their management; they saw that the sheep were suffering from the burden and heat of their fleeces, and at a certain place they halted to clip them, and agreed with a certain individual to let him have all the wool at a fixed price. The following day the wool was to be delivered and the money paid, but the individual not being able to raise the full amount, could not get wool to the value of the cash he had. At the same time a number of poor people had collected about the place and made several offers, according to their means, for portions of the wool; but their united offers falling short of the original valuation they were rejected with contempt, and the wool was ordered to be burnt on the spot, which indicated neither wisdom nor humanity. The former would say, sell the wool for what the people are able to give for it, which in all probability would have amounted to a few hundred dollars; the latter would say, if the people be too poor to buy, better that it should clothe the needy than that it should be burnt. Giving it away might answer a good object; it could not fail to enlist in their behalf the friendship of those among whom they were travelling, which, no doubt, would be of some value. Had the sheep been purchased in Missouri they might have been in Red River before the excessive heats of July and August had come on, and before the tall coarse grass on the plains had come to its full height.

"Many localities on those plains produce a species of plant which, in its native state, is armed with sharp barbed spines, which penetrated the sheeps' skins as they walked through the grass, and finally caused death, which with over-driving killed the helpless creatures by tens and by twenties every day. It was currently reported and believed that 1,200 of these over-driven and helpless animals perished from the cause already referred to, or by the knife, between St. Peter's and Pembina. It is distressing to relate that every sheep that failed to keep up with the flock was doomed to have its throat cut by order of the men who had so unfortunately been trusted with their safety. The agents in these butcheries did not hesitate to inform the writer that in one morning only, while at breakfast, the bloody knife deprived no less a number than forty-four of life. The leaders, as became men in their positions, rode in advance of their charge, and every now and then the men would have to ride up to them with the news that so many of the sheep could not be made to move on. 'Cut their throats and drive on,' was the invariable order. A few days' rest, say one in seven, would have enabled these worn out animals to recruit their strength, or even a few hours each alternate day allowed them to rest and feed, might have enabled many of those whose lives had been cut short by the knife to perform the journey. On their arrival at the top waters of Red River they came to a camp of Sioux, or met with a party of that nation, who received them kindly. These Indians were headed by the great war chief Wanata, who, with a number of his braves, escorted them and hunted for them until they arrived at Pembina; yet such was the intensity of their longing for home that even while protected and provided for by the Great Chief, they drove on without stop or stay, heedless of the wanton and barbarous butchery of many of their charge every day, which so disgusted the drivers that they refused to use the

knife any longer in shedding innocent blood, leaving the business in the hands of their superiors. However, they arrived in the settlement in the latter end of September, with 251 sheep, a few of which died afterwards in consequence of the hardships they had undergone by the way."

In 1835, the Hudson's Bay Company purchased, from the young Earl of Selkirk, all right and title to the grant made to Thomas, Earl of Selkirk, in 1811, for the sum of £84,000. This was done to give the Company undivided control of the land and government of the country. Not satisfied with their repeated failures, the Company, in the year 1836, made another attempt at farming and this year imported a few families from the Old Country. Wonders were now to be performed, and in the spring of 1838, about twenty acres were ploughed and put under crop, but from this little more was reaped than fed the experimenters. The home market still remained open, and farmers had the privilege of selling eight bushels a year to the Company, if they had no other way of earning a shilling. "Hunters and trip men were favored with a market for four bushels from each, at three and six pence per bushel. Importers and mechanics could sell no grain at the Company's stores, which state of things shows conclusively that the settlers raised abundance of grain for their own use, and in the aggregate ten times more than the market demanded. Yet, as soon as Chief Factor McMillan had left his establishment, Captain Cary was on his way to form another—and all for the benefit of the Colony."

"We may ask here, was such a project calculated to benefit the settlers? We do not hesitate to say that it was not; but that its success would have closed against them the limited market that they had hitherto, and might have been the means of sending numbers of industrious men to seek homes in other lands.

"The Company, we believe, was favorable to the Colony while it existed on a small scale, as it supplied that body with provisions and men in the heart of their trading districts, and helped to give a tone to its proceedings at home, which *éclat* that politic body knew well how to turn to serve its own purposes, as is to be seen by the reports submitted to the Colonial Office, in 1836 and 1837, by Governors Simpson and Pelly, when soliciting the renewal of license. These gentlemen did not scruple to claim the merit of having some Catholic and two Protestant Missionaries, with thirteen schools in Red River. We know that the late Bishop of Juliopolis received a salary from the Company, and so did, as we have said, the two Missionaries of the Church of England. The High School at St. John's was patronized by the wintering partners, whose children were the only pupils that were admitted, and on it the fur trade Council bestowed an annual grant of £100; but the unfortunate twelve schools, where the plebeian multitude received all the education that fell to their lot, were unendowed, and even unknown to the nabobs of the fur trade; yet, the two Governors dragged them in to do duty on the above occasion, as well as the experimental farms."

During the year 1835, the Half-breeds, on account of one of their friends being ill-treated, made a demonstration against the Hudson's Bay Company, and so frightened the Officers that they yielded to most of their demands, and as a consequence, they became more over-bearing than ever.

"In the following spring, another physical demonstration took place before the gates of the Fort. A number of demands were made, as follows: 1st. The prices of provisions were to be raised. 2nd. An export was demanded for tallow, robes, and other articles procured by the chase.

"They loudly protested against any import duty being levied on goods imported from the United States, for many

French Canadians and Half-breeds, both French and English, had already made several trips to the Mississippi, exporting horned-cattle, horses, furs, and some articles of Colonial industry, and, on their return, bringing home cotton goods, groceries, ammunition, tobacco, etc., etc.

"These bold adventurers considered themselves entitled to exemption from import duty on two grounds: 1st. On account of their having established commercial intercourse with the neighboring States. 2nd. On account of the great danger incurred on their journey to and fro. Their demand fell on deaf ears, the Colonial Governor and his Council were exclusionists and all interested to defeat every attempt to export the produce of the country, or to introduce foreign manufactured goods, except *viâ* Hudson's Bay. Yet these hostile demonstrations and demands were not unproductive of some advantage, especially to intending settlers, as the salutary fear which they impressed on our men in power, was the cause of reducing the price of land from twelve shillings and sixpence to seven shillings and sixpence. And at the same time, to please the native youth, it was decided by the land agents, that each young man on settling on land should receive twenty-five acres *gratis*."

The population of the country had increased so much at this time, that Sir George Simpson, who was then Governor, decided on forming a Council of the leading men of the settlement. None were chosen except those who were either in the pay of the Hudson's Bay Company or had been at some time connected with them. This circumstance caused the settlers to look upon it, if not with suspicion, with very little confidence. At this meeting, it was decided to raise a volunteer force, to divide the country into districts, to appoint Magistrates, to organize Civil and Criminal Courts, and to erect public buildings. At the close of the session, Sir George Simpson announced the grant of £300 by the Company, in aid of public works at Red River.

This gift came at a very opportune time, as it enabled the authorities to build a Court House and Goal.

It was also decided to charge a duty of $7\frac{1}{2}$ per cent on all goods of foreign manufacture imported into the Colony whether for sale or for use, and still worse they decided to charge an export duty of $7\frac{1}{2}$ per cent on all goods, provisions or live stock, being the growth, produce, or manufacture of the Red River Colony. The impartial reader at this date sees in whose interests these laws were made and the ardent desire the Company had to encourage home production. Before this time (1836) considerable trade had taken place between St. Paul in Minnesota and the Red River colonists, and they saw or thought they saw the destruction of their trade aimed at by the late enactments. The French Half-breeds and Canadians had never taken kindly to the rights or assumptions of the H. B. Co'y, and they writhed under the export duty and took every opportunity of evading it. Fearing that an outbreak might take place a large force of regulars was sent out and quartered in the colony in the Autumn of 1864. After remaining two years they were ordered home and 140 pensioners sent up to take their place. The coming of the soldiers gave new life to the colony and almost for the first time money circulated in the neighborhood of the future Winnipeg.

Mr. Isbester of London, who was a native of the colony commenced at this time an agitation in favor of the country and interested a large number of the British House of Commons in its favor. Petition after petition had been sent home craving the right of trading with the Indians, but no redress could be obtained. Tired of quiet submission they waited for a chance of asserting their rights by force and it came, and, as in 1816, the Company and the Government awoke.

"In the spring of 1849 William Sayre, a French Half-breed, had been arrested and imprisoned for trading furs.

Three other Metis—McGinnis, Laronde and Guillette—had been arrested on the same charge, but held to bail to stand their trial at the first criminal court. The charge against them, namely, their accepting furs from the Indians in exchange for goods, was considered as contrary to the rules of the Company's charter, wherein it is stated the Hudson's Bay Company shall have the sole trade and commerce of all the territories within Rupert's Land. For some time it had been rumored that the party to which the culprits in question belonged were preparing to resist any attempt at the punishment of these men by an armed force, and on the 17th May, on the day appointed to sit upon this celebrated case, the Metis were seen collecting in armed bands from all parts of the country. This movement took place about half-past ten o'clock. Those in command of these armed parties simply stated the object of the gathering to be to resist the infliction of any punishment, whether fine or imprisonment, upon the offenders. They conducted themselves in the most orderly manner, merely surrounding the Court House, and by their presence showing their intentions. It is to be noticed that there was no attempt on their part to interfere with the trial, now about to be in progress; nor was there any attempt made to rescue the prisoners from the hands of the Authorities. When the trial proceeded, Sayre confessed that he had traded furs with the Indians. A verdict of "Guilty" was found against him, and thereupon Sayre proved that one of the officers of the Hudson's Bay Company had given him permission to traffic; and on this pretext he was discharged. The cases of McGinnis, Laronde, and Guillette were not proceeded with and they all left the court together, greeted with great applause.

"It was perfectly patent to the Half-breeds who were directly interested in the trial of this suit, as well as the white settlers, who looked with very considerable interest upon it, that the Hudson's Bay Company fearing to provoke

a collision, which they knew must inevitably occur, had made use of a subterfuge to quietly get Sayre out of the scrape, with at least the semblance of the dignity of the law; and so firmly were all convinced that at least this arbitrary injustice of right was forever broken that the cries of "*Vive la liberté*" and "Trade is free" were heard from all sides. Guns were discharged, hands were shaken, and three volleys given in testimony of the victory."

In 1851 Governor Ramsey, of Minnesota, visited Pembina and made a treaty with the Sioux for the extinction of their claims to the land. On his return to St. Paul he reported that the Red River settlers were raising so much and had such a limited market that they were metaphorically speaking "smothering in their own fat."

The year 1852 was another black-letter year. Early in May the river began to rise and by the 7th it was eight feet above the usual high-water mark. It continued to rise until the 22nd when it reached within eighteen inches of the flood of 1826. Again the people had to leave their homes and wide-spread ruin met them on every hand, but by the 12th of June many were back to their fields and at work putting in a little crop. By the end of the year it had almost passed from the minds of the people and all things went on as usual.

A census of the colony was taken in 1849, which showed it to contain 5,391 inhabitants of all ages and nationalities. Of live stock there was 2,085 horses and mares, 6,014 cattle of all ages, 1,565 pigs, and 3,096 sheep. There were likewise 6,329 acres of land under cultivation. These figures show that the colony had made very material progress, and was not as many yet believe, a land where live stock could not thrive owing to the severity of its Arctic winters. Although 3,000 sheep were in the colony thirty-two years ago, many say in our day that the country is unsuited for them, and they cannot survive the long winters.

The fullness of time arrived in 1857, and the Imperial Government sent out an expedition under Captain Palliser, which explored the greater part of the interior, and during three years gathered sufficient material to warrant him to report favourably on the country, and through his assistants Doctor Hector and Mons. Bourgeau to give the outside world a knowledge of its geology and botany. He reported highly on the Saskatchewan country, and since his day it has been called the "Fertile Belt."

In the same year (1857) the Legislature of Canada fitted out an expedition, and placed it under the command of S. J. Dawson, C.E., and Professor Henry Y. Hind. During the succeeding two years these gentlemen examined the country between Lake Superior and the South Saskatchewan. Their report, which was published in 1859, attracted much attention, and a number of Canadians were induced to settle in the country. Among others who went there at this time was Dr. Schultz, then a student of Queen's College, Kingston. Being at that time under the tuition of Dr. George Lawson, now of Dalhousie College, Nova Scotia, he had imbibed an ardent love of botany, which was the favorite pursuit of that gentleman. While crossing the plains from Crow Wing to Pembina he made a collection of plants which attracted my attention and led me to study the geographical distribution of plants. The result of this investigation showed me that the summer climate of the Red River country was suitable for the growth of all cereals. In after years I had the opportunity of proving this.

The same year that Dr. Schultz came to Red River two Canadians—Mr. W. Buckingham and Mr. Caldwell—brought in a printing press. The end was now approaching rapidly, and the ever astute Hudson's Bay Company saw it, and at once set to work to counteract the effects of a newspaper. Efforts were made to induce the people not to patronize the "Nor'-Wester," the name given to the newspaper, but

these failed. While the printing press was doing its work another power was rising which soon swept down the barriers that interest and ignorance had raised against a better acquaintance with the west. In 1867 Canadian patriots established the Dominion of Canada, and at once a cry was raised for our rights in the west. A determined stand was now made, and most extraordinary stories were told in England before a Committee of the House of Commons, showing that the country was little better than an iceberg. In 1868 Bishop Taché published his sketch of the North-West, and he, too, like the Hudson's Bay Company, looked upon the country as scarcely suited for civilized man. Its rivers were unsuited for navigation, and its climate hyperborean. Not one section is spoken of as being suited to a farming community. Indeed on page sixty-three, when discussing the probabilities as to who the future owners of the country would be, he says:—"For my own part, as there are extremely great difficulties in the way of colonizing *the few points in this vast territory capable of cultivation*, I acknowledge frankly that I would as soon—perhaps preferably—see the country remain as it is as see it change, if the changes are to be such, as it appears to me, they would inevitably be." The italics are mine.

The Bishop had lived many years in the country, had seen more of it than any other man, and in 1868 he writes as above, yet he had read Lord Selkirk's statement made fifty-five years before that the country was capable of supporting 30,000,000 of people. Neither the avowed desire of the Bishop nor the representations of the Hudson's Bay Company could prevail on Canadians to relinquish the desire to obtain this *useless region*, so the Imperial Government took the matter up, and the Hudson's Bay Company's rights were purchased for £300,000 sterling. Although the country was of no value for farming purposes, according to their own showing, they took care to reserve one twentieth of the

"Fertile Belt," when they disposed of the remaining territory, and now advertise 7,000,000 acres of land for sale as their share of it.

But to resume, the advent of a few Canadians and the establishment of a newspaper began to work wonders. In 1862 a light draft steamboat was placed upon the river, but the Sioux massacre taking place a little later so unsettled everything that it was not a success as a commercial venture. Public opinion was constantly becoming more opposed to the rule of the Hudson's Bay Company, and measures had to be adopted to counteract this. Dr. Schultz having got control of the "Nor'-Wester," became very out-spoken against the monopoly, and measures at once were taken to silence him.

In February of the year 1866 he was brought before the Quarterly Court on an action of indebtedness for £300 sterling, but in the absence of the prosecution the case was deferred. The case was brought on again in May, but Dr. Schultz desiring to plead his own cause, and the court not allowing it, judgment was given against him without trial. In the spring of 1867 a large and influential petition was sent in to the Hudson's Bay Company's authorities asking to have Dr. Schultz appointed on the Council instead of Mr. Cairns, a councillor lately deceased. "So strong was the petition in question that it was felt that this man must be got rid of in some way or another." History is said to repeat itself, and now after a lapse of fifty years the North-West Company (Canada), as represented by Dr. Schultz, stands face to face with the Hudson's Bay Company.

The sheriff, with a posse, proceeded to the trading post of Dr. Schultz in February, 1868, for the purpose of putting in force the judgment of the court recorded against him in May, 1867. A scuffle ensued and the sheriff and his men were ejected, but shortly after the Doctor gave himself up, and asked to be tried by the authorities. Tuttle, in his history of Manitoba, thus describes the sequel:—

"The authorities, believing him to be a dangerous subject, bound him securely with ropes and conveyed him in a cariole to the Hudson's Bay Justice of the Peace, before whom he was charged with having assaulted the sheriff in the discharge of his duty. He admitted that he had defended his property in the absence of any legal method of protection to resist the judgment of the court given against him without the intervention of a jury, and in which he had no opportunity to plead his case; and stated that he was willing to abide by the result of a new trial, if a new trial before a jury of the inhabitants was granted. The Hudson's Bay Company, however, finding their dangerous enemy in their power, forthwith consigned him to prison. This occurred early in the day, and before night the inhabitants in the neighborhood, to whom Dr. Schultz had been endeared by his steadfast advocacy of their rights, and his intrepid conduct under oppression, immediately collected, and after an imprisonment of four hours he was released by them, after they had torn down the jail walls and battered in the prison door. The large number who had collected for this purpose were thoroughly excited, and proposed to visit in a body the Hudson's Bay Company authorities, who, from the walls of their fort had witnessed the breaking in of the jail, which was only a few yards distant. The Doctor, however, calmed their feeling by proposing to go alone and unattended, to visit within the fort walls the magistrate who had submitted him to such ignominious procedure. This he did, and stated distinctly that he was still willing to undergo a trial on the charge brought against him, and to give bonds for the payment of the amount if judgment should be rendered against him. No attempt was made to recapture him or any of his friends on this occasion, but later, in the month of January, the General Council was held to consider the critical position of the Hudson's Bay Company's rule in the country; a resolution was arrived at to embody a force of 100 special con-

stables, to be organized into a permanent force. Once raised, however, the authorities felt that public opinion was so strong against them in the Schultz matter, that they refrained from using their newly acquired power, and on the 10th of the following month, thought it better to accede to the Doctor's request and grant him a new trial. At this trial, which was conducted in the ordinary form of jury trials, he was allowed to plead his own case, and received, amidst the unanimous acclamations of the spectators, a verdict in his favor without one dissenting voice; it having been distinctly proven that the claim made of £300 against him was entirely without foundation."

Assiniboia, as it was called, extended in every direction for fifty miles from Fort Garry. Outside of this limit, the settlement of Portage la Prairie had been formed by the Venerable Archdeacon Cochrane, who objected to the rule of the Hudson's Bay Company. Matters went well for a while, but disturbances taking place, it was thought advisable to set up a government of their own, which was organized by Mr. Thomas Spence. No other end was sought in this organization than mutual protection. As soon as the Imperial Government was made aware of what the people had done, it notified Mr. Spence how far he could go without breaking the law. The people now demanded with one voice the privilege of electing Councillors to fill the vacancies caused by death or resignation in the Council of Assiniboia.

For two or three years, grasshoppers had ravaged the Colony, but in 1868, they entirely destroyed the crop, and starvation stared the inhabitants in the face. An appeal was made to the outside world for aid, England sending £3,000, Canada, £3,600, and the United States, £900. Wheat and flour were brought on sleds from St. Paul, Minnesota, and death from starvation averted.

Late in the autumn, the Canadian Government sent out engineers and surveyors to commence the construction of

the road between the Red River Settlement and the Lake of the Woods. This undertaking was looked upon by the Hudson's Bay Company and other parties in the Colony, as the beginning of the end, and during this winter, the subject was much discussed, both in Canada and the Red River Colony.

As usual, at this time, there were many in Canada, who thought we were unable to purchase such a vast domain as the Hudson's Bay Territories, and many elaborate calculations were made to show the foolishness of such a step. After along discussion, the Resolutions introduced into the Dominion Parliament by the Hon. W. Macdougall, were carried by a large majority. Dire results were to follow, as the land was considered by those gentlemen to be dear at any price.

In October, 1868, the Canadian Commissioners sailed for England, but it was not until March 9th, 1869, that the negotiations between the Canadian Commissioners and the Hudson's Bay Company terminated by the former agreeing that the Dominion Government would pay the Hudson's Bay Company £300,000 on the surrender of their rights to the Imperial Government, and that the Imperial Government should, within one month of such transfer, re-transfer the same to Canada.

Early in 1869, an Act was passed by the Dominion Parliament, providing a Territorial Government for the country to be acquired from the Hudson's Bay Company. All the preliminaries being arranged, a number of surveyors were sent up in the summer for the purpose of inaugurating the survey of the Red River Valley.

Many conflicting interests were at work at this time. The French party desired to be left as they were, or if annexation had to take place, let it be with the United States. It was evident to their leaders that few years would intervene before they would be only a mere handfull, and their

power gone forever. The Hudson's Bay Company's officers knew that the English partners cared little for them and less for the country, so long as they could make a profit on their investments. They received \$1,500,000 for their rights in the country, one-twentieth of the land and the fur trade remaining practically as it was. The change benefitted the English partners, but would it help the traders? The few Canadians in the country certainly did not keep still, but talked much of what was coming, and long before winter set in, threatenings were heard of what might take place.

It will be remembered that in the early stages of the settlement, the French Half-breeds lived entirely by hunting, and had their headquarters at Pembina. Gradually they settled down in various parts of the Red River and Assiniboine valleys, and all apparently as squatters. In 1861, Governor Ramsey, of Minnesota, bought the land in the vicinity of Pembina from the Sioux, and never paid any attention to the claims of the residents. Our people commenced to survey the very lands these people claimed as their own, and when Colonel Dennis intimated that some arrangement should be made with the Half-breeds, his report was laid aside, and he was ordered to commence work. Mr. Macdougall does not appear to have considered seriously the probability of trouble referred to in Colonel Dennis' report, and never submitted his letters on the subject to the Council with any recommendation.

On the 11th October, a survey party, under Mr. Webb, was stopped by a party of French Half-breeds, under Louis Riel. No violence was used, Riel and some of his followers simply stepping on the chain, and ordering Mr. Webb to cease work. The reason he gave was that the land belonged to the French Half-breeds, and they would not allow it to be surveyed, until some arrangement was made with them. No arms were seen on any of the party, and only

threats were used, but Mr. Webb thought it most prudent to retire as ordered.

A meeting was shortly after held by the disaffected French Half-breeds, at the house of one of their number, when it was determined to resist the entrance of Mr. Macdougall into the country, by force if necessary. Colonel Dennis now applied to the Hudson's Bay authorities, and Governor McTavish and Dr. Cowan had interviews with Riel, and pointed out the *impropriety* of his conduct. Riel answered, as usual, the French Half-breeds should have been consulted with first. Application was now made to the Church, but Father Superior Lestang, who was in charge of the Diocese during the absence of Bishop Taché at Rome, declined to interfere, on the ground that he might lessen his influence with his people in so doing.

The Half-breeds were not slow to see that the authorities in the country were at one with them or would not interfere, so their next step was to take up arms, and stop further proceedings by force. Mr. Macdougall was ordered to leave the North-West Territories in twenty-four hours, and was compelled to do so by a party of armed men.

It now became apparent that what had been talked of for some time was about to be attempted, and that an independent organization was about to be established. In 1868 Bishop Taché in his sketch of the North-West hinted broadly what the people—his people—wanted. He felt that were Canadians allowed to come in like a flood, there was no hope for his people, and he naturally underrated the country for the purpose of deterring them. His hints had not been understood, and now the country was transferred and his people turned over to new governors without any guarantee that they would be honestly dealt with. We ask not who advised the rebellion, but this we do say that from their experience of the dealings of the Hudson's Bay Company with them the Half-breeds acted wisely from their stand-

point. They lost their lands at Pembina in 1851; in the late transfer their rights were never recognized, and now as free men they decided to look out for themselves. In conversation with a Canadian two years after the event he told me that it was sending up a "cut and dried" Government from Canada, before explaining to the people, that caused all the difficulty. It may have been the excuse for the rising, but the apathy or something worse of the Hudson's Bay Company and the plain advice of Bishop Taché, were evidences of a something which lay deeper than that. Warning after warning having been given to the Hudson's Bay Company that Fort Garry would be taken possession of, they paid no heed to them but just went on as before. As it is not my purpose to write a detailed account of the "Rebellion," but merely to show the causes that led to it. I will give in the words of a late writer the taking of Fort Garry by the rebels, and Governor McTavish's explanation regarding it.

"About the same time that Hon. Mr. Macdougall was driven back to Pembina by Riel and his followers, it began to be rumored that the insurgents intended to take possession of the Fort, and the authorities were duly informed of the fact in ample time to have made preparations for its defence, had they felt so disposed, but they paid no attention to the warning. Sergeant James Mulligan, at the time chief of police at Fort Garry, states in an affidavit taken subsequently, that he 'urged upon Dr. Cowan, the chief factor in charge of Fort Garry, the danger in which the Fort stood, from the intention of the insurgents to seize it; and requested him to call upon a portion of the 300 special constables and the pensioners to defend it.' Fort Garry was a strong stone fort, bastioned and defended by thirteen six-pounder guns, was amply supplied with ammunition and provisions, and had in it also 390 Enfield rifles, so that if Governor McTavish had only closed the gates, he could, at

least, have held the place against any force that the insurgents could possibly have brought against him, if he was afraid to do more; but even this he failed to do, although he and Dr. Cowan were warned by other parties than Mulligan that the place would be taken possession of. Not the slightest precaution was taken, the gates were not closed, cannon were not in position, and yet the Governor and chief factor knew that a body of men had been in possession of the Pembina Road for ten days, and had threatened to occupy the Fort. On the afternoon of the second of November, Riel, with about 100 men, came down the road from Rivière Sal, entered the open gates, and immediately proceeded to billet themselves in the various houses within. Dr. Cowan, the officer in charge of the Fort said 'What do you want here with all these armed men?' Riel replied, 'We have come to guard the Fort.' 'Against whom?' asked Dr. Cowan. 'Against a danger,' Riel answered. This was all the explanation given, and seemed to satisfy the chief factor; and Riel and his followers were left in unconditional possession.

"The force being housed, next fed, proceeded to arm themselves with Enfield rifles in place of their own shot guns, closed the gates, set a guard, placed the cannon in position, and for the first time since its inception the rebellion became formidable. The insurgents had now possession of nearly all the cannon in the settlement; were abundantly supplied with small arms and ammunition; had all the provisions and other stores of the Hudson's Bay Company, more than enough to last them all winter, and it became evident that if they pleased to hold possession of the Fort until spring they could do so, for there was no force in the settlement able to dislodge them, and it would be summer or perhaps later before any force could arrive from Canada. In short, the insurgents were now 'masters of the situation,' and held the position which ought to have

been occupied by the loyal party, and which they would have occupied but for the supineness—to use no harder term—of the officers of the Hudson's Bay Company. Governor McTavish's explanation of the capture of Fort Garry, as conveyed to the Hon. Mr. Macdougall in a letter dated 9th November, is certainly a remarkable production when we consider that the Hudson's Bay Company was still the *de facto* government, and that he, as the chief officer, was supposed to protect the property of the Company if nothing more. He says: 'Excepting in one respect—but that, I am sorry to say, a serious if not in a formidable sense—little change as far as we can learn has, since my last, come over the arrangements or the spirit of these people. * * * The occurrence to which I have alluded in the preceding paragraph is, this, that on the afternoon of Tuesday, the 2nd inst., a number of these daring people suddenly, and without the least intimation of their intention to make such a move, took possession of the gates of Fort Garry, where they placed themselves inside and outside the gates, to the number in all of about one hundred and twenty, and where, night and day, they have constantly kept a pretty strong armed guard. On being asked what they meant by such a movement upon the Fort, they said their object was to protect it. Protect it from what? they were asked. Their answer was—danger. Against what danger? they were asked. To this question, they replied that they could not specify the danger, but that they would do so hereafter, and obstinately took up the positions they have since kept, in spite of all our protests and remonstrances at such a bold and high-handed proceeding. On coming into the Fort, they earnestly disclaimed all intention of injuring either person or property within it, and it must be allowed that in that respect they have kept their word; but it is an inconvenience and a danger next to intolerable, to have a body of armed men, even

with professions of peace towards ourselves, forcibly billeted upon an establishment such as this. Their intentions in coming to the Fort they have never definitely expressed, nor have they yet specified the danger from which their presence was meant to protect the place. We are, therefore, left in some measure to conjectures, and by these we are strongly led to believe that you were expected to come to the Fort, and that by thus having previous possession of the gates, they felt that they would be sure of keeping you out.' The extreme simplicity of the Governor of Hudson's Bay Company in being led to believe that the object of Riel, in taking possession of the Fort, was to keep Mr. Macdougall out, is certainly refreshing—especially as he had been informed ten days before, that the capture of the Fort was intended for that very purpose."

Shortly after this letter was written, W. B. O'Donohue, an Irishman, joined the movement and assumed the duties of Treasurer, collecting the import duty of four per cent. on all merchandise not imported by the Hudson's Bay Company. This man, after the rebellion was crushed, being banished from the country, wrote the following letter to the Speaker of the Dominion Parliament, on the 26th February, 1875. What gives point to his statements is the fact that he was private tutor to Governor McTavish's children, and, therefore, intimate with him. He writes: "I make the following statement of facts, which I can prove most conclusively:—

"The insurrection was advised by Governor McTavish, who, with other officers of the Hudson's Bay Company, also aided and abetted it from its inception up to the very hour it ceased to exist. That Riel was in constant communication with Governor McTavish, and on many occasions under his instructions. That he, Governor McTavish, fully recognized the Provisional Government. That Donald A. Smith, on arriving at Fort Garry, recognized the Gov-

ernment also in my own hearing, and, with Governor McTavish, was Riel's adviser during his stay at the Fort, and after the departure of both of these from the country, Riel continued to hold counsel with John McTavish, who then represented the Hudson's Bay Company."

After December 1st, "The Bill of Rights" was drawn up and sanctioned by the French party and their adherents. This Bill was evidently what Bishop Taché had in his mind before the trouble commenced, and when too late, the Hudson's Bay Company saw they were playing into the hands of men opposed to their pretensions as well as to those of the Canadians. When the "Bill of Rights" was passed, it became apparent to the most oblivious that wiser heads than a few French Half-breeds were guiding the movement, and the people of Canada woke up to a right understanding of the matter.

During the winter Riel carried matters with a high hand, and attempts were made to break or modify his power, but without avail. The Canadians were taken prisoners and lodged in Fort Garry, the Fenian flag was hoisted, and all connection with Canada declared at an end. The few Americans in the country used their influence to have an annexation movement begun, and a newspaper was started to promulgate these views. In the meantime Bishop Taché was on his way from Rome, and strong hopes were entertained that on his arrival quietness would reign. One of the Canadians named Thomas Scott had made himself obnoxious to Riel by his outspoken loyalty, and this man Riel determined to put to death. Without a show of a trial he was condemned to be shot, and on the 4th of March at noon he was taken outside of the Fort and brutally murdered. On the 9th of March Bishop Taché reached Fort Garry, and at once poured oil on the troubled waters. Riel offered to give up all the Hudson's Bay Company's property on the 23th of the same month, and about that date the annexation

sheet ceased to appear. Acting under Bishop Taché's advice the "Fenian Flag" was hauled down and the Union Jack was hoisted in its stead. Riel now became very loyal, and "God save the Queen" was played by his band.

The regulars and Canadian militia were now mustering on the west end of Lake Superior, and shortly after started on their long and arduous expedition through the wilderness. On the 24th of August Colonel Wolseley's troops arrived at Fort Garry, and the same morning Riel and his valiant band disappeared.

CHAPTER XXVI.

Ten Years Reminiscences and Notes on the Various Settlements and Villages.

Purport of the Chapter—Manitoba and Winnipeg as They Were in 1872—Grasshopper Plague—Crop of 1875—Stage Ride in the Winter of 1875—Disappearance of the Grasshoppers—Settlements Extend to the Second Plateau—Nelsonville Founded—Wet Seasons Commence—Many Observers Condemn the Country—Rapid City Commenced in 1878—Land in the Neighborhood Rapidly Settled—The Assiniboine Ascended to Fort Ellice in May, 1879—Crowds enter the Country East of Fort Ellice—Birtle Founded—Rock Lake Settlement—Winter of 1879-80—Odanah and Minnedosa the Rage in the Spring of 1880—Grand Valley Comes into Notice—Stiff-necked and Soft-hearted Immigrants—Mosquitoes Prove too Much for Them—English Ideas of Canadian Kindness—Canadian Notions Regarding Englishmen's Inability to Fall in with the Ways of the Country—No Stealing on the Plains—Settlements North of Birtle—Formation of the "Syndicate"—The "Boom" at Portage la Prairie—Winnipeg and Emerson take the Fever—Route of the C.P.R. Changed in the Spring of 1881—Brandon Founded on the Assiniboine—Vigor of the Syndicate—Railway Opened to Brandon—Speculation at Fever Heat—Conflicting Statements Regarding the Country—Short Notices of Selkirk, Emerson, Portage la Prairie, Morris, Brandon, Rapid City, Minnedosa, Odanah, Birtle, etc., etc.

It is not the purpose of this Chapter to give a history of the last ten years, but merely to indicate the successive steps by which the country was opened up and the various villages laid out. In the chapters on the History and Progress of Winnipeg, Education and Religion, Steamboats and Navigation, Railways and their development much of the history will be introduced, so that this chapter will be merely complimentary to them.

During 1872 numerous settlers came to the country by the Dawson route via Lake Superior, while others came on the Northern Pacific to Fargo and either descended the Red River in boats or drove their own horses over the prairie to Manitoba. The preceding year the smallpox had raged on the plains and many Indians had died near Edmonton of the disease Captain Butler had just pub-

lished his "Great Lone Land" and with the volume in my hand I entered for the first time the portals of the great plains. Winnipeg was a small village near Point Douglas and half a mile of prairie intervened between it and Fort Garry. Eastern Portage la Prairie consisted of one house and the western end could boast of one or two small houses around the Hudson's Bay Company's store. Grant and Mackenzie had settled on Rat Creek, nine miles to the west, but no settler had crossed the creek except the former. This season a few settlers took the road to the White Mud and laid the foundation of the settlements that sprang up there during the next year or two.

For the next three years the grasshopper plague was upon the whole province and no wheat or next to none was raised in 1875. Many got a crop of potatoes, but the country was on the verge of starvation, and all the seed wheat had to be brought from Minnesota. Dufferin had been laid out on the boundary in 1873, but no progress was made. West Lynne on the west side of the Red River was a place of some importance as the high road to St. Paul passed near it. Stage-coaches were not infrequent in their transit through the village carrying their loads of shivering passengers to or from the bleak prairies of Dakota. A winter stage-coach ride of fifty-eight consecutive hours from Winnipeg to Fargo made the most lasting impression. Night and day we kept on, and enjoying a nap in a stage coach with the temperature at zero was the greatest luxury we had. Our waking moments were full of torture, but sleep, such as it was, made us oblivious to suffering. The very marrow in our bones seemed to freeze, and as I write I shudder at the recollection.

A new era dawned in 1876. The grasshoppers disappeared, a large immigration took place, heavy crops were produced and the land rejoiced. This year settlement extended beyond the Pembina Mountains, Nelsonville was

founded, the people learned that the upper plain was as fertile as the lower, and the land along the boundary became thickly settled. A series of wet years now set in. Many parts of Manitoba were little better than a bog or a lake and numerous individuals, who had gone out to take up land, returned with evil reports. In 1877, settlement reached the "Big Plain" beyond Pine Creek, and the next year Rapid City, on the Little Saskatchewan, was founded by J. C. Whelhem.

The summer of 1878 saw a large immigration to the country around Rapid City, and to meet the demands of trade an attempt was made to ascend the Assiniboine to a point whence goods could be taken to the settlements on both sides of the river. The boats ascended without difficulty to a point about eight miles above the mouth of the Souris and discharged their cargoes at the foot of the "Rapid." This location obtained the name of "Rapid City Landing" as all goods destined for that point were landed here.

Captain Webber, of the steamboat "Manitoba," examined the "Rapid," and pronounced his determination of taking freight and passengers to Fort Ellice. This was in May, 1879. His attempt was successful, although the wise ones at once condemned the whole undertaking. While he was getting his cargo I reached Winnipeg, and learned that the roads were in a terrible state for at least 150 miles. He promised to wait a day for me, and in the meantime I bought all my outfit for the plains, and we started at the appointed time. We reached Fort Ellice all right, and a highway was opened to the interior. The attention of both speculators and farmers was now turned to the river, and a large number settled a little east of Fort Ellice, and Birtle was founded by a gentleman, named Chambers, from St. Catherines. The Souris Plain was a great point of attraction, and many settlers took up claims and began farming around Rock Lake.

During the winter of 1879-80, interested parties got up some excitement about Odanah and Minnedosa, two embryo cities, located where the "North Trail" crosses the Little Saskatchewan. In the spring, a rush took place, and the boats on the Assiniboine River were loaded with freight and crowded with passengers, destined for those two "cities." Instead of using "Rapid City Landing," as in the spring of the preceding year, the boats now ascended the river to "Grand Valley," six miles above the rapid, and here the nucleus of a new city was established. Hundreds of tons of freight came up the river in the spring of 1880, numerous immigrants arrived, and things looked lively.

While in camp a week, at the "Grand Valley," I had ample opportunity of studying the peculiarities of the people. Camped by themselves were a number of English families, the members of which kept themselves apart from all others, and seemed to court seclusion. No attempt was made to gain information, and as a natural result, none was proffered. One day, two young men with their outfit started off for Rapid City. Owing to the heavy rain which had been falling for some days, the trail (*Road*) was very bad in many places. Lacking experience, and being unaccustomed either to ask or take advice, they made little progress and camped less than a mile from the "Landing," after having loaded and unloaded their waggon four times. Scarcely any progress was made the next day, and the second night they camped at a water-hole in a little hollow. A Canadian passing by told them to pitch their tent on an adjoining hill, as the mosquitoes would be bad that night. In response he was informed that they knew their own business. How they passed the night is not known, but early the next forenoon they reached the "Landing" again, sold their outfit for what they could get and were off for more congenial companionship in Winnipeg. On the same boat which took them back we cheered a number of

others who, through ignorance, will or cowardice, had given up the attempt at settlement and had left in disgust.

My camp was on the south side of the river and late one evening three young Englishmen crossed the river with two heavy loads of goods in two poor carts. While we were remarking on their foolishness for starting so late they passed us without a word and proceeded on their way towards the Brandon Hills to which they were bound. They had not gone two hundred yards when an axle broke and their load fell to the ground. We went up to see what was the matter, and as soon as I learned the nature of the accident I offered to lend them a cart and had my men assist them to load up, but advised them either to stop all night where they were or leave part of their loads. The leader of the party now asked me my charge for the cart and assistance, and as I only laughed at him, he said they had been told before they left England to hold no communication with Canadians as they would charge an exorbitant price for everything they sold and do nothing without pay.

We became more confidential, and I told him what we thought of them and how we looked on their proceedings. As I advised him to leave potatoes and flour, and a large trunk in his broken cart till the next day, he asked, would it not be stolen? I informed him that only white men stole, and that Indians and Half-breeds, no matter what was said to the contrary, were strictly honest and as a matter of principle did not appropriate anything found on the prairie.

I relate the above incidents as specimens of certain classes of occurrences that are constantly taking place, and a little less reserve on the one hand and much less contemptuous criticism on the other, would wonderfully assist in smoothing over the difficulties and privations incidental to settling in a new country. Acting on advice given by me, many Englishmen settled to the northwest of "Grand Valley" in the spring of 1880. Owing to the surveys that were now

being prosecuted with vigor, many settlers went northwest from Birtle to Shell River and located there.

In the summer of 1880 Sir John Macdonald went to England with the avowed purpose of making arrangements with capitalists for the building of the Canada Pacific Railway. On his return in the autumn he announced his success, and in the early part of the winter the Canadian Parliament ratified the bargain. During the winter indications were seen of an advance in real estate throughout the country. Sir Charles Tupper in November had informed the people of Portage la Prairie that the Railway would be located close to the village. In response to this the value of real estate almost doubled at a bound, and the excitement spreading to Winnipeg the people there were at fever heat before spring. Emerson followed suit, and every little village throughout the South-west grew into a city.

As spring advanced speculators and actual settlers poured into the country, and as the cars were now running to Portage la Prairie there was no difficulty in reaching the centre of the new movement. The "Syndicate" decided to change the location of the road, and at once all eyes turned to "Grand Valley" as a possible point for profitable investment. McVicars, who owned the land at the "Grand Valley," refused to sell except at an extravagant price, and the "Syndicate" decided to build their town one and a half miles farther up stream, and in a few days the new city of Brandon, 145 miles west of Winnipeg, was in the market.

The works on the Canada Pacific Railway were pushed on with great vigor, and the public were informed that the cars would be running south of the Assiniboine before August. People poured in by the hundred. All the land south of the Assiniboine along the line of railway was taken up, and hundreds of lots sold in Brandon at fabulous prices. Stores, hotels, dwelling-houses, and other buildings were run up as if by magic, and where nothing but prairie was seen

in the spring the nucleus of a thriving city with all civilized appliances appeared before the short summer was passed. In September, regular railway communication was opened between Winnipeg and Brandon, and 145 miles of easy transit into the interior established. South of the Assiniboine the whole plain was prospected, and many locations were taken up by speculators and others. New railroads were projected, cities were laid out on paper, others which had better claims were thrown on the market, and a period of feverish activity set in which still continues and seems to become intensified every day.

Like all new countries many conflicting accounts were given of Manitoba and the North-West. Travellers and others whose names, out of deference to their standing in society, I shall not mention, wrote strange stories about the country. Manitoba was declared to be little else than a bog or marsh. The Souris Plain was shown conclusively to be a desert—a sandy barren waste condemned as sterile by these men, but still rich by nature. Because I refuted this fallacy, one gentleman in Nova Scotia, who has not looked on the country for twenty-four years, and does not know that southwestern Manitoba is at present considered the garden of the West, said in a newspaper article last summer that the Government paid me for writing falsehoods regarding it. Others passing hurriedly over its various trails, and seeing sand or gravel in the ruts or around badger holes, write: "The whole region passed over to-day possesses a sandy or gravelly soil and an arid climate, and is worthless for agricultural purposes." The writer and the lands are both in existence. The former still writes as intelligently about other matters. In the hands of practical farmers the latter has so changed its appearance that another class of writers say it is unequalled for farming purposes in the North-West.

My work in the past has been to refute false statements regarding the country, its climate, soil, capabilities and re-

sources. By whomsoever a false statement has been made, I have met it with prompt denial and have always given my reasons for so doing. There is one class of speakers, however, to whom I have made no answer. This class are representatives of the people, and if they make statements at variance with known facts, it is not my province to dispute them.

Previous to 1874, the site of the present city of Emerson was merely a prairie with small cultivated patches here and there, and no indications of a city in the future were apparent. The nearest point at which any signs of a settlement were visible was where the old Hudson's Bay Company's post existed, just across the boundary line, while three miles distant, on the American side also, was the hamlet of Pembina, and the united settlers at both places, at the beginning of the year we have mentioned, did not exceed 150 persons.

In the spring of this year, Messrs. Thomas Carney and W. N. Fairbanks had 640 acres of the present city site laid out into lots, and the same summer Mr. F. T. Bradley and Captain Ash laid out 200 acres more. Thus the original town plot of the city included 840 acres, an extent unusually large and certainly indicative of great faith on the part of the founders of the city. People in other portions of the North-West began to believe that it was possible for a town to exist here, and before the winter of 1874 had set in quite a few business institutions of various descriptions were permanently located in the village.

The proprietors of the town site of Emerson acted with a spirit of great liberality in those days. They sold their lots quite cheap, and assisted in the establishment of a school and the regular ordinances of religion. In the summer of 1875 the population was about 100 all told. During 1879 the growth of the village was very rapid. The opening of the railway between it and St. Paul in the spring had given

a great impetus to immigration, and Emerson and the surrounding country received great additions to their numbers. The close of the year found Emerson with a population of over 800, and that steady stream of prosperity now set in which has continued ever since.

Early in the spring of 1880 Emerson was incorporated as a city, and at once the inhabitants taxed themselves to build a bridge across the Red River, so that farmers living on the west side of the river might bring the produce of their farms to the city. A steam planing mill and steam flouring mill were now in operation, and numerous other manufacturing industries were established. The summer and autumn of 1880 were busy times in Emerson, several brick blocks were erected, and churches began to rise in various parts of the city. The close of the year saw a population of almost 1,400 in Emerson, while her business places numbered not less than seventy-five, the trade operations extending for 200 miles to the westward.

Last year (1881) the progress of the city was remarkable. Many fine buildings were erected, lumber mills were established, and the Emerson Agricultural Works were put in operation. At the close of the year her population had increased to fully 2,500, and six denominations of Christians were holding weekly services, while her public school was attended by nearly 200 pupils and taught by three teachers.

That Emerson is destined to be a city of considerable importance can be seen at a glance over any of the late maps, and the possibilities are thus set forth by a recent writer: "The Gate City is practically the southern key to all the Canada Pacific Railway Company's lines, and from it two trains are run daily direct to Winnipeg, and directly through to Portage la Prairie and Brandon. That Emerson will long remain this Company's base of operations is evident from the commodious depot arrangements which they have made here. Their freight and passenger arrangements are not

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those of a wayside station, but are as extensive as any in Manitoba. Such are the present advantages conferred by this railway on the Gate City, but these are small compared with those which will arise from the extension to be made in the near future. By the close of 1882 the Pembina branch will be extended into the city and westward therefrom through the Turtle Mountain and Rock Lake Districts, and thereafter onward to the Souris Valley coal fields. This extension will open up the richest district of the North-West, and will make Emerson the point of entry from which emigration will flow westward into the same. It will lay the whole country open commercially to the merchants of Emerson, and lay the coals of the Souris Valley down in the city, to assist in building up her manufactures. In short it will make the Gate City a main point of distribution in the work of settling up and developing the great North-West."

The business of Emerson has increased even faster than its population, and during the last year it attained great dimensions. As would be expected in a western city the real estate business is a leading and profitable one. The manufacturing establishments are still in their infancy, but they turned out work worth \$607,200 last year. The building trade alone reached the neighborhood of \$200,000, and in the coming year it will more than double. The country commercially tributary to Emerson extends over 300 miles west, and many houses in the city have an extensive trade over the intervening country. Within the city limits there are fifty-eight houses engaged in trade, some of which are doing a very extensive business. The total value of the sales of those fifty-eight houses during the past year amounts to \$1,399,400, besides giving employment to 170 hands. The total value of the business done in the city by all parties in the year ending February 28th, 1882, was \$2,549,400. Eight years before, this same locality was with-

out a house; now it is a busy hive of ambitious pushing men who are laying the foundations of a future commercial centre.

Next in importance to Emerson is Portage la Prairie, situated on the neck of land between the Assiniboine and Lake Manitoba. It is rather more than fifty miles west of Winnipeg on the main line of the Canada Pacific Railway. As early as 1855 Archdeacon Cochrane had built a church in the neighborhood, but with this exception little was done until 1861, when the Hudson's Bay Company started a store at the west end of the present town. Ten years more pass away and in the meantime the country is transferred to the Dominion, Riel's rebellion has blown over, and people are settling down to the actual business of life. The lands in the vicinity are taken up, stores and other places of business are established, and a regular stage is put on the route between Winnipeg and the Portage by Mr. Michael Blake, so that by 1875 Portage la Prairie was considered a place of some importance. In 1876 the Prince Rupert, a steamboat of 120 tons burden, ascended the river Assiniboine from Winnipeg, and communication by river was established. The places of business in the fall of this year numbered about twenty, and included a few very extensive "concerns" for a frontier village. At this time two regular church organizations were at work in the village, a well-managed school was in operation, and the population of the place was a little under 300 people. Next year two large flouring mills were in operation with a capacity of nearly 200 barrels in twenty-four hours. During the greater part of the year their powers were tested to the utmost in supplying the immediate neighborhood and the far interior with flour.

After many vexatious delays the Canada Pacific Railway reached the village in the early part of the winter of 1880. At once a general advance in real estate commenced, which has continued ever since. At the close of this

year the population was about 800, and was increasing wonderfully. There were almost sixty business places, including two banks; two lumber and two flour mills, all run with steam power; one brick and various other smaller manufacturing establishments. A recent writer, describing the wonderful growth of the place, says:—

“With the opening of the spring of 1881 the rapid growth of Portage la Prairie commenced. When it became known in May that the Canada Pacific had passed into the hands of a syndicate, who would lose no time in pushing the work to completion, Portage la Prairie became a point where a great amount of speculative attention was centred. Its location on the narrow strip of land between the Assiniboine River and Lake Manitoba, across which all railway lines from the lower Red River Valley, whose objective points are in the great North-West, must pass, gave it immense advantages geographically, and the fact that around no other town in Manitoba can a richer agricultural country be found, settled the question of its becoming a city of importance in the near future. That the Canadian Pacific Railway Syndicate recognized their advantages may be inferred by the rapidity with which they constructed the Air Line between this city and Winnipeg, thus materially shortening the route between the two cities, and making a track as proof against snowblocks as engineering skill can secure. Their energy in extending westward from the city, reaching Brandon, a distance of seventy-eight miles, by August, and the amount of other grading done before the close of the year convinced the most incredulous that Portage la Prairie was in a few years to become a prominent city on the great main line of railway which will connect the Atlantic and Pacific provinces of the Canadian Dominion.

“In May, 1881, a third bank was established in Portage, and business institutions of every class multiplied with a magic rapidity, and were only limited by the building re-

sources of the city. In August the "Tribune," a second newspaper, was established, and has since made its appearance weekly. Landed property of every description, in and around the city, has since the spring of 1881 risen rapidly in price, and many old settlers, who had for many years struggled along at farming, suddenly found their lands becoming of great value, and themselves lifted from comparative poverty to opulence. The limits of the town increased with its business growth, and its wide streets are giving evidences of soon becoming busy thoroughfares.

"During all this rapid advance in business and the value of property, the population of the Portage has been making equally rapid strides. By the close of 1881 over 2,700 souls resided within the city limits, and now, with the opening of the spring of 1882, the number cannot be under 3,500."

When we consider that the "Portage" has more than trebled its population in one year, and that there are indications of its being doubled again the present year, we are not the least surprised at the enthusiasm of its inhabitants and the prophecies we hear regarding its future greatness.

The Portage, Westbourne and North-Western Railway Company are pushing on their road to the west and have at the present writing 36 miles of the road graded and purpose having trains running to Odanah and Minnedosa at the crossing of the Little Saskatchewan by the first of September, 1882. By the terms of their charter this Company have a land grant of 6400 acres for every mile of road they shall have constructed within a certain date, and as their survey runs through one of the richest belts of land to be found in Manitoba, the lands at their disposal will offer the very best attractions for settlers of the farming class. Other roads are projected and from the situation of the "city" there is no doubt of its becoming a railway centre in the near future.

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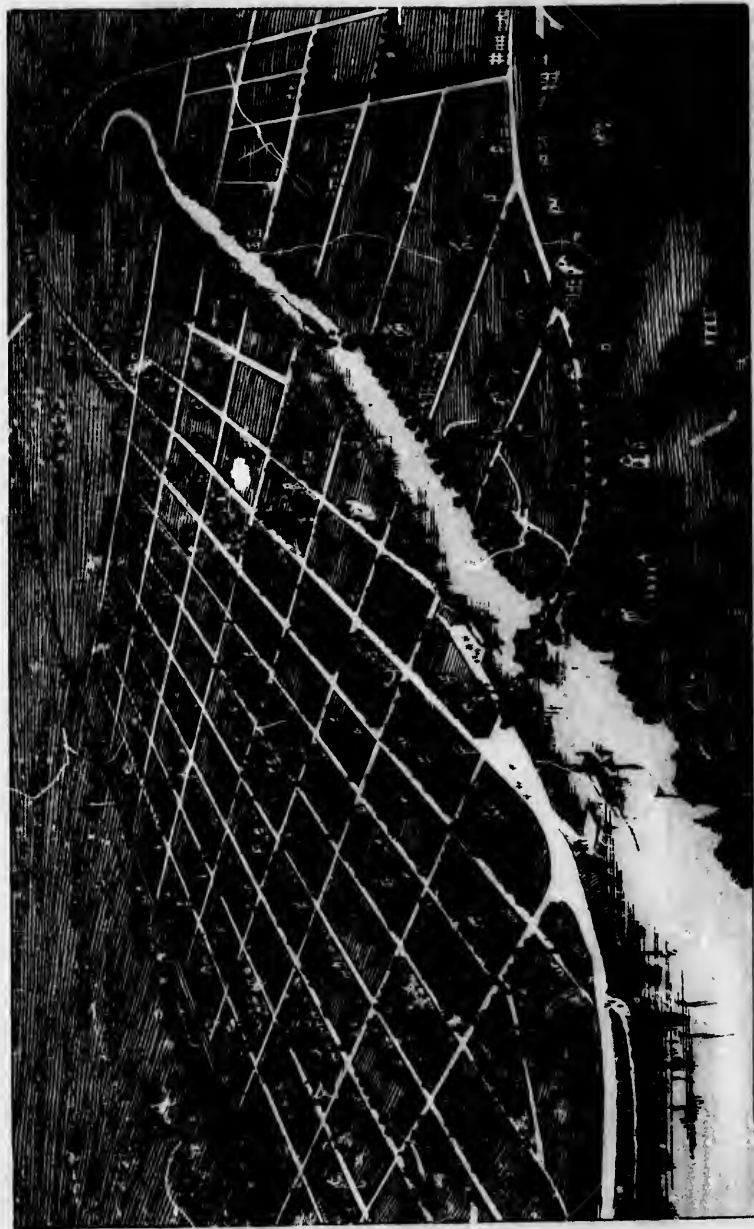
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BIRDS' EYE VIEW OF EMERSON

THE BURLING LITHOGRAPHIC CO. MONTREAL

west side of the Red River, twenty-four miles from the city of Winnipeg. Its origin dates from the year 1875. In that year the offices of the Canada Pacific Railway were located on the west bank and about the same time the first store (then called the "Warehouse") was built by J. & F. W. Colcleugh. Selkirk, being directly on the main line of the Canada Pacific Railway and at the point where that Railway was to cross the Red River, speedily attracted attention. In the following year (1876) many other stores as well as hotels were erected and Selkirk's future was brighter than any other place in the then comparatively unknown province of Manitoba. The most determined opposition, however, was raised by the people of Winnipeg who, aware of the manifold advantages of Selkirk, did all in their power to retard its progress and build up their own city at its expense.

When the change of Government occurred in 1878 and it was decided to make use of the Railway bridge about to be built at Winnipeg, and to run a line west from that city, a severe blow was struck at the future prospects of the town under notice. Those interested in the town, however, did not despair of its ultimate progress, and early in the present year a by-law granting a bonus of \$70,000 to the C. P. R. Syndicate for the purpose of building a line of railway along the west bank of the Red River to Winnipeg was submitted to the Municipality of St. Andrews and passed. A Company to build a railroad west to Poplar Point and Portage la Prairie was also formed, and the charter will be applied for at the present session of the Local Legislature.

Among the many natural advantages possessed by Selkirk are two harbors of great depth, caused by "sloughs" running back on each side of the river sufficient to accommodate vessels of any size. The town is practically at the head of deep water navigation on the Red River, owing to the rapids at St. Andrews, a few miles south. The lumber trade

of Lake Winnipeg is growing in importance, and Selkirk without doubt will become the shipping point for the western country. The district around Selkirk will furnish an inexhaustible supply of cordwood, while in the immediate neighborhood are several excellent freestone quarries and gravel pits. It is also in the centre of a first class agricultural country.

One great advantage, possessed by Selkirk over almost every other place on the Red River, is its situation on a high ridge of land, which commences twelve miles to the south and runs as many miles to the north. This ridge was almost the only part left uncovered by the floods of 1826 and 1852, when the site of the present city of Winnipeg was completely submerged. This spring the height reached by the water was such as had not been attained for many years. The high water level at Selkirk was sixteen inches above that made during the flood of 1852. The town was then found by measurement to be fourteen feet above the water.

At the present time Selkirk contains, besides a large number of dwelling-houses, five general stores, one drug store and telegraph office, and numerous other businesses. Besides these there are four churches and schools suitable for the population. It is scarcely wise in a matter of fact man like myself to become a prophet, but I may state that I see so far into the future as to say that, about the middle of the coming summer, the iron horse will reach Selkirk on its way to the west, and as it turns south its drivers, who will be many and very strong, will be asked why turn ye away from the river, and they will answer, like the men of old, because there is no passage for our steed and the train that follows it. Then a very learned man shall stand forth and say, listen unto me, ye men of might who drive the iron horse, behold a straight line is the shortest way between two points. They will be astonished at this and take down their measuring instruments, and behold the scales will fall

from their eyes, and they will see that it is so, and a passage for their steed will be built, and it will go on its way to the west without turning either to the right hand or to the left. Then will the head of the Selkirk be lifted up, and she will stand on her feet and be much talked of among the people, because there will be a *boom* there. Behold this must come to pass because it is written on the tablets of the future.

Rapid City was the next village which came into existence. An English company had obtained a few townships from the Government on certain conditions of settlement, and in accordance therewith a village or town plot was surveyed in 1877, and settlers were brought out from England and located on the lands. Being beautifully situated on the Little Saskatchewan, about 150 miles west of Winnipeg, and on the "high road" to the interior, it quickly attracted attention, and the country in the vicinity was soon in the hands of industrious settlers. Through the energy of Mr. Whelhems, who had charge of the colony, it was established on a secure basis, and during the summer of 1879 was without a rival in the estimation of western people. At present four railroads are projected either to pass through it or to start from it, and its future promises to be a prosperous one.

In the spring of 1879 the Assiniboine was ascended to Fort Ellice, a distance of 210 miles west of Winnipeg, and many settlers came to that neighborhood. The point where the main trail to the west crosses Bird Tail Creek, twelve miles east of Fort Ellice, was selected as a site for a village by a gentleman named Chambers, and a number of houses were erected. The selection was a good one, and now the village is erected into a town under the name of Birtle. On account of the supplies of timber in the Riding Mountain, which are being utilized by the people of the neighborhood in the erection of buildings at the present time, this section of country will or ought to be always attractive. In the sum-

mer of 1880 a steam saw and grist mill was put in operation, which at present supplies all the wants of the settlers in both lines. Railroad communication will develop this district of country in a short time.

Rumours that the Canada Pacific Railway was to cross the Little Saskatchewan, about twenty miles north of Rapid City were industriously spread during the winter of 1879, and in the following spring, two cities appeared on paper, named respectively Odanah and Minnedosa, the former being on the east side of the stream and the latter on the west. As a matter of course a rush took place, and a steady stream of people flowed in all that summer. Owing to the certainty of the Portage la Prairie and Westbourne Railway passing through these villages their future prosperity is secured.

The formation of the "Syndicate" in the autumn of 1880, and the transference of the Canada Pacific Railway to it in the spring, upset the speculations of many *site* seekers, and turned their attention to the more southern district. The announcement that the "Syndicate" was about to take the southern route was soon followed by the selection of Brandon as the site for a future city. Mr. Sandford Fleming in his Railway Report for 1880, advised the Government to adopt this route, and to found a city at this very point. The following extract is taken from page 248 of the report:—

"I have carefully examined all the data at command, and I think that a modification of the latter line points to a scheme worthy the consideration of the Government. If the railway be carried to a point in the valley of the Assiniboine, near the mouth of the Little Saskatchewan, where the land remains unsurveyed and ungranted, there might here be established the site of a city which would shortly become important."

After giving various reasons in favor of this scheme, he says, on page 240:—

"The adoption of the lines to the point I have indicated in the valley of the Assiniboine near the mouth of the Little Saskatchewan, would provide 150 miles of an excellent trunk line leading from Winnipeg and Selkirk to the coal deposits, and would to that extent make provision for the supply of fuel, where no timber exists, and thus anticipate a want sorely felt in many quarters. The laying out of a city at the point mentioned, and the location of stations at regular intervals on other ungranted lands along the line, would secure to the Government all the benefit arising from the enhanced value which would be given to the land, to assist in meeting the cost of the railway."

It will be seen by the foregoing extracts that both the Government and its officials were aware of the importance of Brandon as a railway centre, and had the Government held control of the road, they would most undoubtedly have carried out the above suggestions. It will be seen then that Brandon is not a speculative point, but one where naturally a large city would spring up. In the spring of last year the town plot was laid out on the south side of the Assiniboine and in a few days houses began to rise as if by magic. All through the summer the excitement kept up and with the setting in of winter there was no cessation. Last September North Brandon was surveyed and many other additions have since been made on both sides of the river, so that speculation has created, on paper at least, a city of extraordinary dimensions where nature intended there should be at least a very important one. The situation of Brandon is very fine and with the picturesque hills on both sides of the river presents, even now, a fine appearance from any point of approach. The site is well chosen in every respect and unlike Winnipeg is secure from floods, commands any quantity of excellent water and will always prove healthy as drainage is quite practicable. Taken as a whole the situation of Brandon is a favorable one in every respect, and there cannot be the

slightest doubt regarding its future importance both as a railway centre and the emporium of a fine farming country in the immediate neighborhood. At present writing it contains 1500 houses.

Many other "cities," towns and villages have sprung up in various parts of Manitoba, and their promoters speak in high terms of their future prospects. I shall mention no names and hence make no comparisons, but just state two elements necessary to the wellbeing of every city. I refer to water and drainage. It would be as well for parties purchasing lots in these embryo cities to consider these two requirements, as no great city can exist without them. The planting of a town or city, on an open prairie without a running stream means death to the inhabitants by disease or the destruction of the place by fire should one occur.

CHAPTER XXVII.

Description and History of Winnipeg.

[A CHAPTER WRITTEN BY J. C. McLAGAN, ESQ.]

Position of Winnipeg—Fort Rouge—Fort Selkirk—The Founders of Winnipeg—Winnipeg in 1870—Railway Surveys—Pembina Branch—Winnipeg the Outlet of the Interior Trade—The "Boom" in 1881—Statistics of the Trade of Winnipeg—Enumeration of the Chief Buildings—Present Area of the City—The Business Corporations—City Schools—Former Trade with Winnipeg—Contrasted with the Present—Railway Grounds and Offices—Postal Facilities Past and Present—Leading Societies—The Press of Winnipeg—Agricultural Society—Extracts From Lord Dufferin's Speeches—Geographical Position—Rivers and Lakes of Canada—Mennonites and Icelanders—The Future of the City—Appearance of Winnipeg to a New-Comer—How Business is Transacted—Preponderance of Males—Occupation of the People—Their Steady Habits.

THE City of Winnipeg is situated nearly in longitude 97° west, and latitude 50° north, at the confluence of the Red and Assiniboine rivers, which at present form the eastern and southern boundaries of the city. At the southern extremity of Main street is Fort Garry, for many years the most important trading post occupied by the Hudson's Bay Company. The old fort yet stands, and although to some extent dismantled, yet is an object of much attention and interest to the many strangers and travellers who visit the city and the great "Lone Land" of the far West. The old residence of Governor of the Hudson's Bay Company has been occupied as "Government House," and in it the occupant of the gubernatorial chair has resided since Canada acquired the country. A new and more pretentious building is being erected for His Honor. Fort Garry ere long will then pass out of existence, a step rendered necessary in consequence of the site being needed for a continuation of Main Street to the Assiniboine bridge, and for the erection of buildings more suitable to the valuable site it occupies. The fort and the many stirring

and interesting events which have taken place around its wooden palisades, are so closely identified with the history of the country in its early days, that to write a complete record thereof would occupy more space than the limits of this chapter will permit. Suffice it to say, however, that the history of Fort Garry is almost that of the North-West.

Previous to Lord Selkirk's occupancy of the country, a party of adventurers in the year 1734 established a fort known as Fort Rouge, at the angle of the Red and Assiniboine rivers. This is now the property of Stewart Mulvey, Esq., and forms part of the parish of West St. Boniface, one of the rising suburbs of Winnipeg.

The first fort, or trading post, established by the Hudson's Bay Company was at Point Douglas, and then known as Fort Selkirk. During the conflict between the Company's forces and those of the North-West Fur Company at Seven Oaks, in the Parish of Kildonan, this post was destroyed. Another was built in the year 1817 at the angle of the Red and Assiniboine rivers, where the grist mill at present stands. The famed Fort Garry was completed and occupied by the Company in 1835, and was then considered the greatest wonder of the western plains.

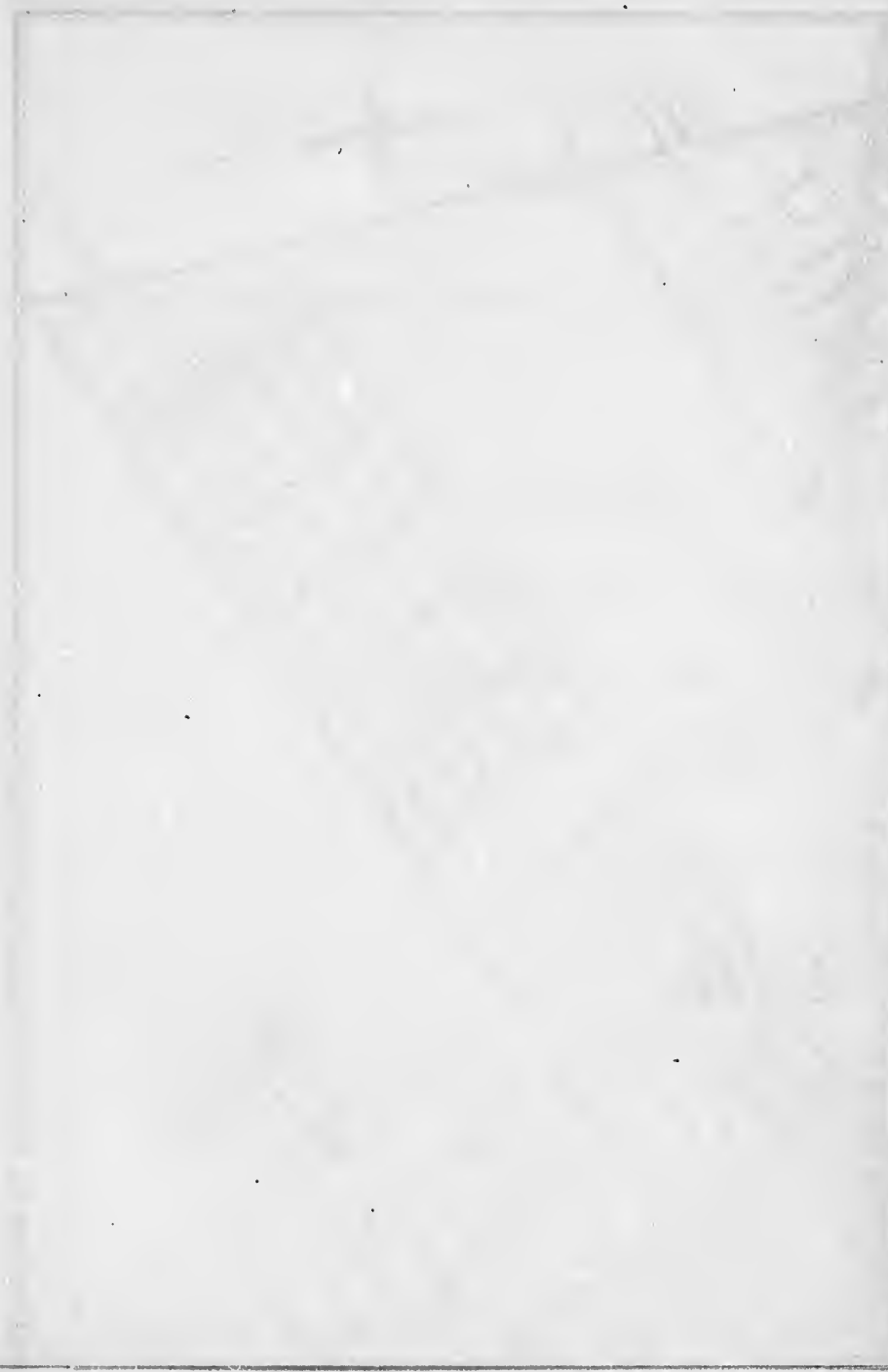
The site for the future Metropolis of the North-West Country was wisely chosen by the early traders and founders of the present Winnipeg. The country surrounding it for many miles is perfectly level, yet sufficiently elevated above the rivers already named to admit of easy drainage. Few places possessed the natural advantages that did the site adjoining Fort Garry, for it had rivers navigable from south to north many hundreds of miles, and from east to west far into the interior of the great "fertile belt." These streams formed part of a chain of navigable waters, extending from the centre of Minnesota to the base of the Rocky Mountains, and from Winnipeg to Fort Pelly,

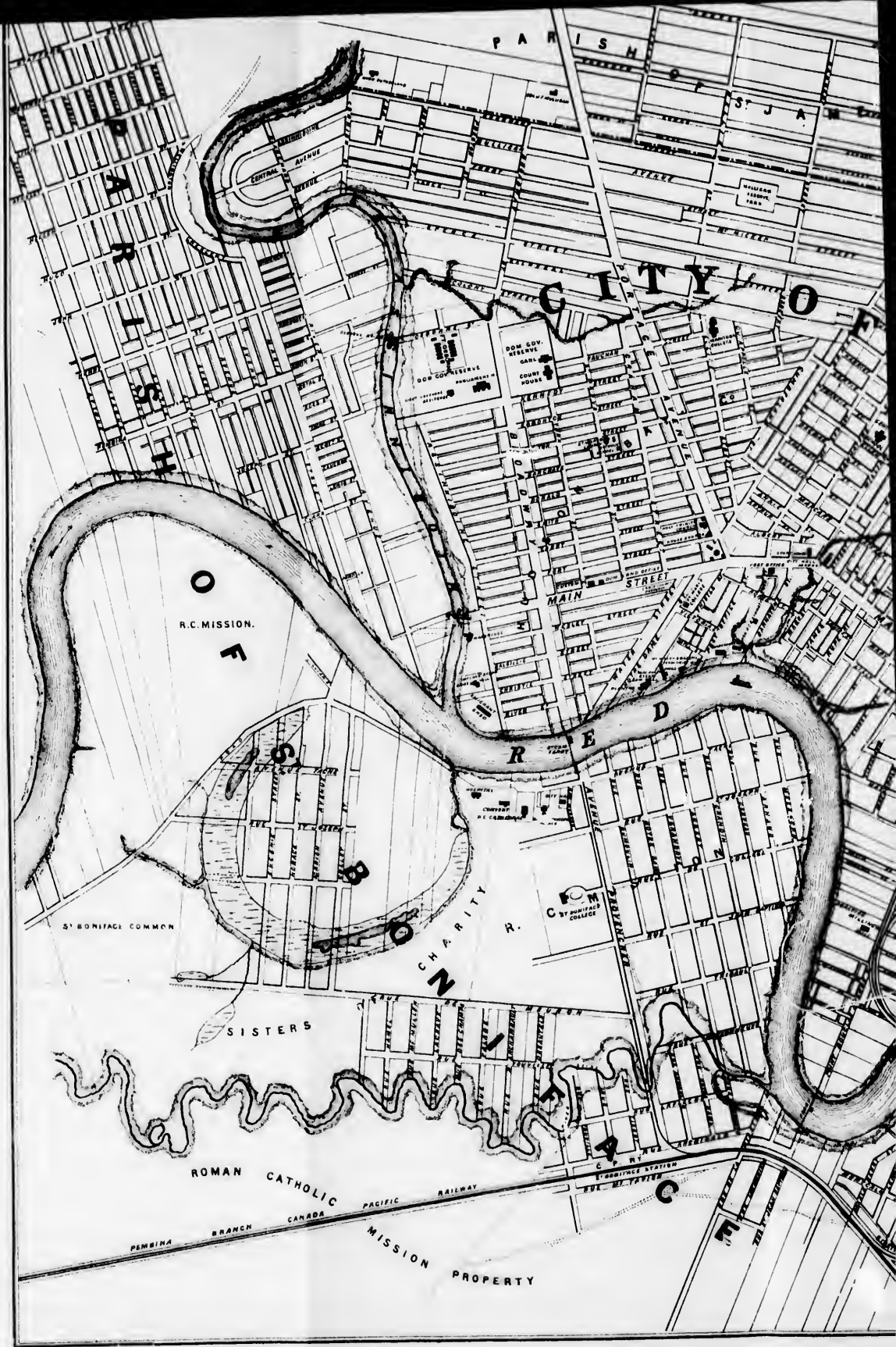
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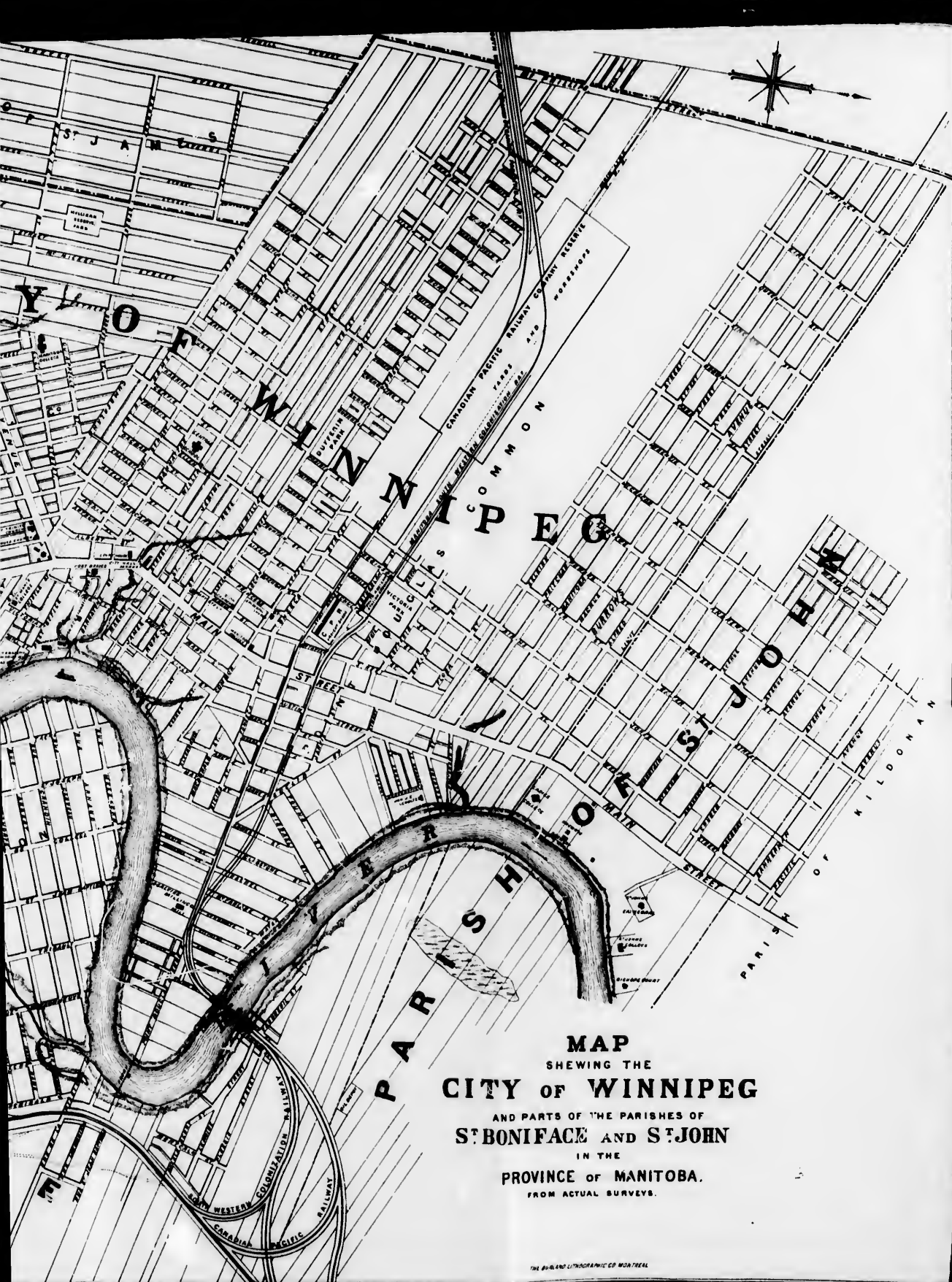
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embracing Lake Winnipeg and Lake of the Woods and the many streams tributary thereto.

The Red River channel at Winnipeg is very different now to what it was when the first settlers came in. The soil is alluvial and the continual action of the water on the banks is having the effect of increasing the width of the water-way. It is said that the lately deceased Mr. McDermot first crossed the stream on a small oak tree that had fallen into the channel. To-day several trees would be necessary to span the river for the width is about three hundred yards on an average.

It is equally certain that the same gentleman kept a small skiff in readiness for any emergency that might arise during the spring and summer freshets. He had seen the entire country surrounding Winnipeg inundated twice, and determined to be prepared should such a calamity occur again.

The license giving the Hudson's Bay Company exclusive control of the trade of the country expired in 1859. Shortly thereafter several enterprising, intrepid pioneers and traders, knowing that the trade of the Company was very profitable, entered into competition with that powerful monopoly for a share of the vast fur trade. These men termed themselves "free traders." Following these, a few settlers came and took up land and began its cultivation. The traders erected stores in close proximity to the Fort. Many of them are still residents in the city, occupying leading and responsible positions as merchants, professional men, and citizens. They were the founders of Winnipeg. The stores they had erected around the Fort formed the nucleus of a small village, which in 1862 began to increase. Year by year—though far remote from the centres of trade and the outer world—the embryo village spread its limits; slowly, it is true, but always holding its own, until the transfer of the country was made to Canada in 1870. At

that time there were about thirty buildings outside the Fort, embracing eight stores, two saloons, two hotels, a mill, and a church; the total population being 215 souls. Then the great "Lone Land," which, according to Lord Beaconsfield, is a land of "illimitable possibilities," became part of the Canadian Confederation. About this time the Fort and its neighbourhood was the scene of the troublous events of the Red River rebellion, the movement being headed by Louis Riel and others. This was a critical period for the little colony on the banks of the Red River.

In consequence of its very isolated position, Winnipeg, or Fort Garry, was at all times a difficult point to reach. From the south the route was entirely through foreign territory. To the north there was a route *via* Hudson's Bay and the Nelson River to Lake Winnipeg, thence to Fort Garry by the Red River. A voyage from the motherland by this route occupied a whole season. The numerous portages to be encountered rendered it all but impracticable. To the west, for thousands of miles, stretched vast prairies,—the Rocky Mountains, and Selkirk and Coast Ranges on the Pacific, forming natural barriers over which no transportation could possibly take place. From the east an attempt had been made to enter the country by way of Lake Superior, and thence across intervening water stretches and portages. This route was the one adopted by the military authorities when they sent troops to quell the rebellion. On the 14th of May, 1870, Companies "One" and "Four" of the Ontario Battalion, under command of Col. Boulton, sailed from Collingwood *en route* for Fort Garry. On the 21st of the same month Company G of the 60th Rifles, under command of Col. Wolseley (now Adjutant-General Sir Garnet Wolseley, K.C.M.G.), embarked at the same point. After encountering many difficulties west of Lake Superior, the scene of trouble at the embryo city was reached on the 23rd

of August. The waving of the "meteor flag" of Old England from Fort Garry restored quietness. Confidence took the place of doubt and uncertainty, and an era of unrivalled prosperity was at once entered upon.

The Federal Government had acquired a vast extent of exceedingly fertile land, extending from the International boundary on the south to the unexplored regions on the north; from the Ontario boundary on the East to the British Columbia line on the West, embracing a territory with from 250,000,000 to 300,000,000 acres of generally fertile and productive land. Negotiations for the surrender to the Imperial Government, by the Hudson's Bay Company of what they claimed as vested rights, had been carried on for a number of years. The terms for surrender were finally agreed to on the 9th March, 1869. The Dominion Government, through the Imperial Government, agreed to pay the Hudson's Bay Company the sum of £300,000 sterling; and to allow them reservations of lands in the neighborhood of their forts and trading posts, where under cultivation, and two sections in each surveyed township. In the fertile belt alone the Company owns about seven million acres, which are of great value in consequence of the immense increase in the price of lands all over the country.

The construction of a trans-continental railway formed part of the basis of union between the Dominion of Canada and British Columbia. The admission of that Province took place in July, 1871. Steps were at once taken to make a survey of the proposed line. Exploratory parties were sent to the Pacific coast, the North-West Territory, and to the north of Lake Superior, Winnipeg becoming the headquarters for supplies to the corps of engineers in Manitoba and the North-West Territory.

The Pembina branch of the C. P. R., extending from Selkirk to St. Vincent—where connection was to be made

with the American railway system—was put under contract by the Mackenzie Administration in 1875. The grading was fully completed that year. A difficulty having arisen amongst the shareholders of the St. Paul road, with which it was intended to connect at St. Vincent, and a stoppage of construction having taken place, the nearest railway station was at Fisher's Landing. The people of the Prairie Province were caused much annoyance and inconvenience in consequence of the lack of proper railway facilities. The Government gave assurances that as soon as the Americans completed their line to St. Vincent the Canadian road would likewise be completed, and fully equipped to carry traffic to St. Boniface, opposite Winnipeg, and on to Selkirk and Cross Lake. Tenders were accepted in the spring of 1878 for the track-laying, bridging, ballasting, and fencing of the line from Selkirk to St. Vincent. The last rail was laid and the last spike driven on the 2nd December of the same year. Meantime a Syndicate of Canadian and American capitalists had obtained control of the now St. Paul, Minneapolis, and Manitoba Railway and all its connections. No time was lost by them in completing their line to make connections with the Canadian road at St. Vincent. Early in 1879 trains began to run. Winnipeg now became joined to the outer world by an indissoluble iron band, and her connections were thoroughly established. This was the greatest step in the wonderful march of progress that had hitherto characterized her history. The "golden gate" to an immense country, teeming with latent wealth, had been flung open, and thousands, eager to participate in a share of the undeveloped treasure, poured into the land.

Winnipeg agreed to build an iron bridge across the Red River and make it free for railway and other traffic, on condition that the Government would run their Pembina branch into the city. A line had been surveyed for a couple

of hundred miles in a westerly direction from the city and one hundred miles thereof were put under contract. The people became hopeful, and real estate began to rise, slowly at first, but as surely as the sun. The population of the city kept on increasing at a marvellously rapid rate. Hotels, boarding and private houses became crowded; while thousands poured into the interior of the country.

Another railway company—the Manitoba and South-Western Colonization Railway—had obtained a charter from the Dominion for constructing a line of railway running in a southwesterly direction from the city, with headquarters at Winnipeg. This line was looked upon as a very important feeder to the city's trade, and its early completion eagerly hoped for. The city constructed the Louise bridge for the use of this company, and all railways hereafter entering the city from the east side of the Red River. The bridge is a free one for railways and all traffic.

The fall of 1880 brought about the bargain between the Dominion of Canada and a Syndicate of capitalists, whereby the latter body undertook the construction of the Canadian Pacific Railway on behalf of the Government. It is now supposed that in the course of six years a complete iron band will link together on Canadian soil the shores of the Pacific and Atlantic.

Winnipeg is the doorway through which must pass from east to west, and *vice versa*, until some other route may be found—a matter which is very improbable—the vast number of millions of bushels of wheat and of other products of the soil that in the near future will be grown between the Red River of the North and the Rocky Mountains. Navigation will be likewise largely utilized in carrying lumber, coal, and other fuel to the city. The coal deposits found everywhere on the upper Saskatchewan will be taken advantage of. Any obstacles to navigation will be removed. Large, powerful steamers will be put on the route, and the re-

mote Saskatchewan country brought within a few days sail of the Western Metropolis. The Assiniboine will likewise carry on its bosom, for hundreds of miles inland, vessels of medium draught loaded with valuable freight. While away to the south, to the head waters of the Red River, far into Minnesota and Dakota, this great natural waterway will be the medium to carry traffic to Winnipeg. A net work of railways will concentrate in Winnipeg as in Chicago. Each new project—whether for new lines or extensions of those established—will point to Winnipeg as the haven which it desires to reach. Winnipeg must become a great distributing emporium for an area sufficient to grow as much wheat as is now raised in the United States and Canada combined—a country entitled to be named the “granary of the world.”

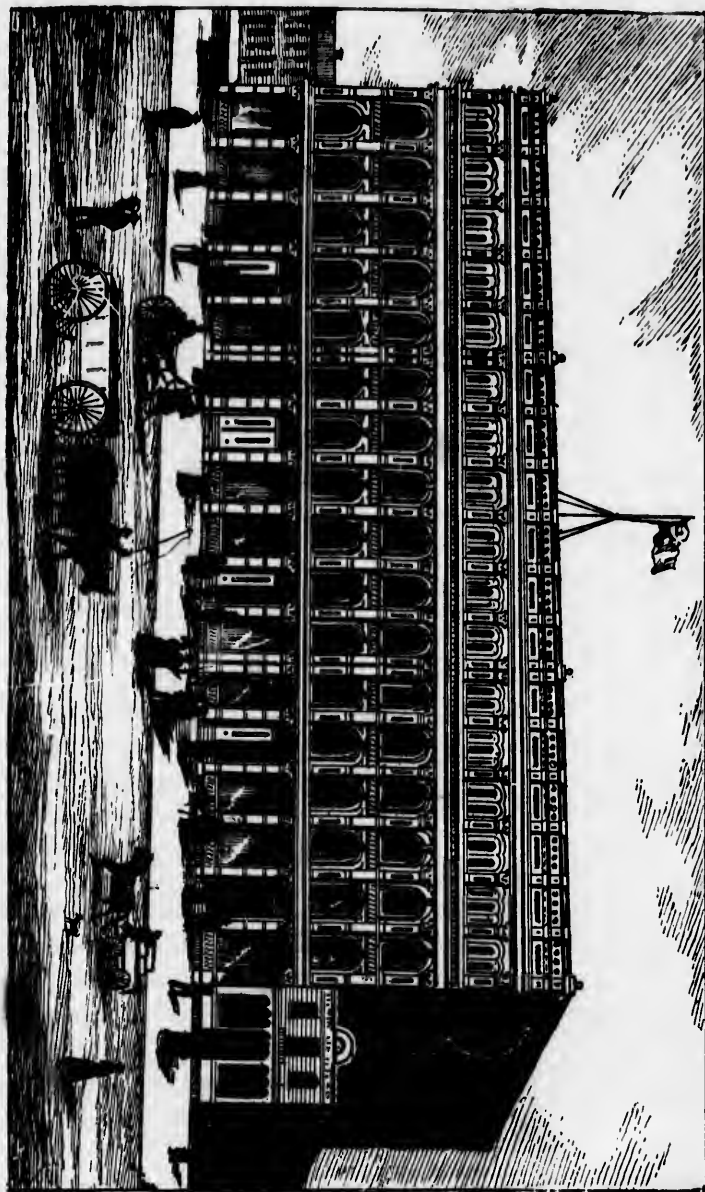
With these increased facilities for transportation it is safe to say that the position of Winnipeg will not be excelled by that of any other city in the country. Her population is already increasing at an enormously rapid rate. Though but an infant in years her trade already is of gigantic proportions. Large blocks of buildings specially adapted for wholesale purposes are being erected. These are rented ere the contract is awarded. Business premises are not to be obtained at any reasonable cost. Dwelling houses are rented at figures that amaze ordinary Eastern people. In short the supply is totally inadequate to the demand.

The excitement during the fall of 1881 amongst real estate owners was intense. Nothing to equal it had ever before occurred on Canadian or British soil. Thousands of dollars were made by operators in a few minutes. Vast fortunes were secured in a day. The excitement spread like wild fire all over the country. Cool-headed professional and business men, clerical as well as lay, left their callings in other parts of the country for the scene of the modern Canadian El Dorado. Real estate agents became as numerous

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as the sands on the sea shore. The educated and refined, as well as the illiterate, took part in land transactions. No regard was paid as to whether the vendor had a right to sell or not. Everything was taken for granted. At the time we write the "boom" still rages, though in a somewhat abated form.

In no better way can the progress of any city, town, or country be judged than by statistics. The case of Winnipeg is one of which her citizens have a right to feel proud. Beginning her career in the sisterhood of cities in 1874 with a population of 2,000, the census of 1878 gave her 7,000, and this in 1880 had increased to 10,000. At the time we write the number must be 18,000. The assessed value of the rateable property of the city in 1874 was \$2,676,018; 1879, \$3,415,065; 1881, \$9,230,435. It is supposed the assessment of 1882 will run close upon \$22,000,000. These figures are exclusive of the exempted property which embraces churches, Government, Canada Pacific Railway, and Corporation buildings.

Notwithstanding the vast amount of public improvements carried on by the corporation, the erection of bridges, schools, and a bonus of \$200,000 to the Canadian Pacific Railway, the debt of the city is but \$620,000—a bagatelle as compared with its resources. Representing this debt as an asset, the City has her City Hall and Market Square, the Central and Ward Schools, the Louise Iron Bridge, one hundred miles of the Canadian Pacific Railway towards the Pembina Mountain country and the workshops connected therewith. Hitherto the rate levied has not exceeded one cent on the dollar of the assessed value, and this covered school as well as municipal purposes.

During the present year it is intended to pave part of Main Street with block cedar, and to enlarge the City Hall. Other improvements are likewise certain to follow.

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persons who may establish manufactories in the City. Already the Ogilvie Milling Company's handsome flouring mills grace Point Douglas, and are by by-law exempt from taxation for a period of thirty years. These mills are to be fitted up with machinery to grind the Manitoba hard wheat under the new Hungarian process which is by rollers instead of by stones. The flour made under this process is a very superior article and commands the highest price in the market.

An equally satisfactory exhibit is to be found in the figures kindly supplied us by the Custom House officials which are as follows:

*Goods entered for Consumption and Export at the Port of
Winnipeg.*

YEAR.	FOREIGN.	DUTY.	CANADIAN.	EXPORTS.	TOTAL.
1872... ..	\$1,002,092	\$46,839	\$150,000	\$180,000	\$1,332,092
1873... ..	1,028,597	48,074	250,000	350,000	1,628,597
1874... ..	1,853,664	67,471	500,000	1,000,000	3,353,664
1875... ..	1,227,294	171,430	638,674	850,000	2,715,968
1876... ..	1,735,421	253,045	960,557	1,100,000	3,795,978
1877... ..	1,214,833	192,480	1,018,166	950,000	3,183,000
1878... ..	1,171,105	223,530	1,374,311	1,050,000	3,595,416
1879... ..	1,196,287	274,235	2,266,085	760,000	4,272,372
1880... ..	1,238,157	297,769	3,599,980	562,714	5,098,620

And for the year ending December 31st, 1881, the value of foreign imports and duties collected for the several months were .—

VALUE IMPORTS		DUTY	
January..	\$70,021	.....	\$14,446.88
February	49,649	.....	10,384.43
March.....	174,266	.....	39,362.99
April.....	183,137	.....	40,649.65
May.....	384,596	.....	86,264.22
June.....	466,344	.....	114,221.33
July.....	200,272	.....	40,257.91
August	292,756	.....	52,391.81
September.. . . .	300,695	.....	70,706.02
October	355,022	.....	62,508.07
November	294,726	.....	60,985.86
December	283,354	.....	51,719.11
Total.....	\$2,994,838		\$652,898.28

The increase in duties
paid in the last six
months of the year
being :—

\$20,507 46
29,979 44
51,306 69
37,298 36
42,517 18
31,111 27

The increase in duties collected for the month of January,

1882, over January, 1881, amounted to \$28,790 70, the figures being :

January, 1882.....	\$43,246.58	
" 1881.....	14,446.88	\$28,790.70

A corresponding increase in the general volume of business transacted in the city has likewise taken place; the trade with interior towns being a large and profitable one. The failures were of a minor nature, involving no large sums and were but few in number.

Mr. Stewart Mulvey, Collector of Inland Revenue for Manitoba and the North-West Territory, has supplied us with the following comparative statements of malt used and beer manufactured for the respective years named.

YEAR.	Malt used. lbs.	Beer made galls.
1873-74.....	97,690	33,534
1875-76.....	104,066	41,289
1877-78.....	177,734	62,614
1879-80.....	337,739	116,672

Spirits ex-warehoused for consumption, for

YEAR.	Proof Gallens.	Duty.
1873-74.....	4,044 60	\$ 2,548.10
1875-76.....	13,066 45	11,758.15
1877-78.....	17,685 66	15,913.10
1879-80.....	53,001 72	53,001 72

Tobacco ex-warehoused for consumption, for

YEAR.	lbs.	Duty.
1874-75.....	1,540	\$228.00
1875-76.....	33,987½	6,797.50
1877-78.....	90,848½	13,169.70
1879-80.....	262,366	52,473.20

In 1868 there were not more than thirty buildings outside the Fort. Instead of regular streets, there were only "trails." About this date it was deemed expedient to lay out a town plot. A wise precaution was adopted by the founders of the city, in making Main Street and Portage Avenue wide thoroughfares. Both of these streets have an average width of 132 feet. The former runs from the Assiniboine, parallel with the Red River, towards Kildonan, a distance of three miles. It is as level as a board the entire distance. This street is the main

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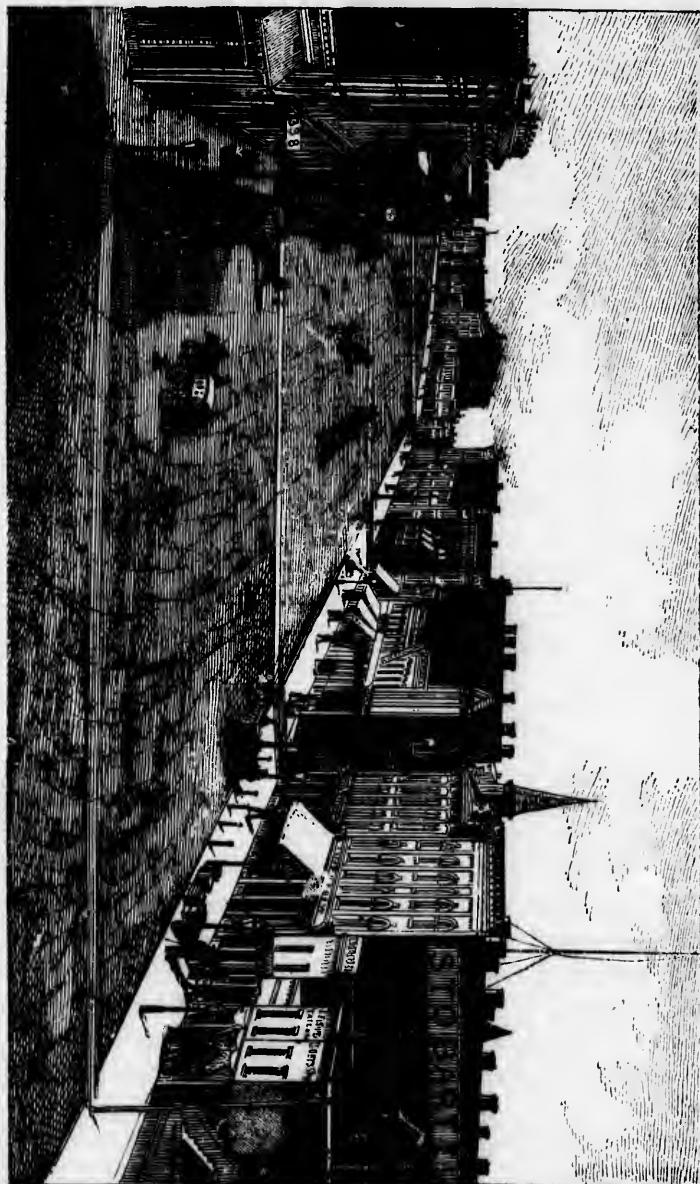
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thoroughfare of the city and will remain so for many years to come. Beginning near the Fort are to be found the Land and other Offices of the Canadian Pacific Railway Company; the Pacific Hotel; the Customs House and Inland Revenue Office; the Dominion Lands Office; the Emigration Office; all of them handsome white brick structures. By all odds the handsomest building in the city is the new warehouse and stores of the Hudson's Bay Company. Another fine structure is being erected by Governor Cauchon, immediately opposite. The Post Office and City Hall are likewise on Main street, also the Bank of Montreal, the Ontario Bank, Merchants' Bank, the Imperial Bank, the Dominion Savings Bank, as well as many private banking institutions, and the offices of Loaning and Investment Societies, and of several Insurance Companies. Every branch of trade is represented by the mercantile firms on this street. Many of the stores are palatial in appearance internally and externally. Wooden structures are giving way to elegant edifices, embracing all modern conveniences. In a few years Main street will be to Winnipeg what Broadway is to New York. Portage Avenue, running from the Red River in a westerly direction parallel with the Assiniboine, is also a very fine street, and certain to be one of the most important in the city. Already it boasts of several handsome buildings. Next are Notre Dame and Princess streets, both coming prominently to the front as business streets. Broadway is destined to be the Fifth Avenue of Winnipeg, and will be the fashionable quarter of the city. Everywhere buildings are in process of erection. The sound of the hammer and trowel are to be heard from dawn to darkness. On every side the hum of activity greets the ear. In 1880, over 400 buildings were erected, at a cost of about \$1,000,000. In 1881, 700 were built, involving an expenditure of \$2,100,000. For the present year the sum to be expended will probably exceed \$5,000,000.

The present area of the city covers nearly three square miles. It is bounded on the South and East by the Assiniboine and Red Rivers; on the West by Boundary and McPhillips streets, and on the North by the Parish of St. Johns. These limits must be enlarged ere long, to embrace South and West St. Boniface, part of the parishes of St. James, St. Johns, and Kildonan. A comprehensive system of drainage will then be inaugurated; streets laid out and sidewalks constructed, and improvements in boulevarding and tree-planting will be carried forward from year to year, until Winnipeg becomes a forest or garden city, as well as the great city of the prairies.

Already there are a large number of companies and corporate bodies within her borders. A Gas Light Company has its works already erected, pipes and mains laid, and services to houses supplied. A Water Works Company is equally far advanced. The Street Railway Company expects to have cars in operation in a few months. The North-West Omnibus and Transfer Company has been carrying on business for some time. Most of the business houses are connected by telephone. Electric lights and fire alarms are to be erected in different parts of the city. Bridge Companies are throwing structures across the rivers at different points.

As the city increased in size, population, and influence, her educational facilities were not allowed to fall behind. The city now boasts of a large Central School Building and a number of ward schools, which are all well attended. The first school was opened on Monday, 30th October, 1871, in a small wooden building 16x20, with a thatched roof. The school population then was fifty, and the average attendance twenty-five. Mr. W. F. Buxton was the first regularly appointed teacher by a board of trustees.

Equally great is the contrast between the means of transportation in 1878 and 1882. For some years previous

to 1870, the Hudson's Bay Company had a small steamer by which they conveyed their merchandise from Georgetown to Fort Garry. So tedious was the journey that but two trips each way were made in a season. Traders outside the Company were compelled to freight their goods by ox carts over the prairies from St. Cloud, the Company declining to convey freight for others on any condition. Frequently the supplies of the "free-traders" ran short, and no means were afforded them to supplement their stock. In short they were at the mercy of their powerful opponents. In 1871, the firm of Hill, Griggs & Co., of St. Paul—the senior of whom, James J. Hill, was a Canadian from the County of Wellington, in Ontario, and now a member of the Canadian Pacific Syndicate—put an opposition steamer on the river to ply between Moorehead and Winnipeg. As the traffic increased the fleet was enlarged until at present over twenty steamers and barges are engaged in the river trade.

The North-Western Navigation Company have steamers now plying between Winnipeg and Edmonton, by way of Lake Winnipeg and the Saskatchewan River. Boats can be taken on the South branch of that great stream as far as the point at which it is to be crossed by the Canadian Pacific Railway. For years past the Hudson's Bay Company have had boats on these waters. Rates for passengers and freight were, however, very high. Few emigrants could afford to pay the prices charged, and the overland route had to be taken. The Winnipeg and Western Transportation Company, likewise, have a fine fleet plying the waters of the Assiniboine, Red River, and Lake Winnipeg. Competition will have the effect of keeping down rates; giving the travelling and trading public the advantages of cheap transportation, and securing a greater amount of traffic to their own lines.

Winnipeg is the headquarters of the General Manager,

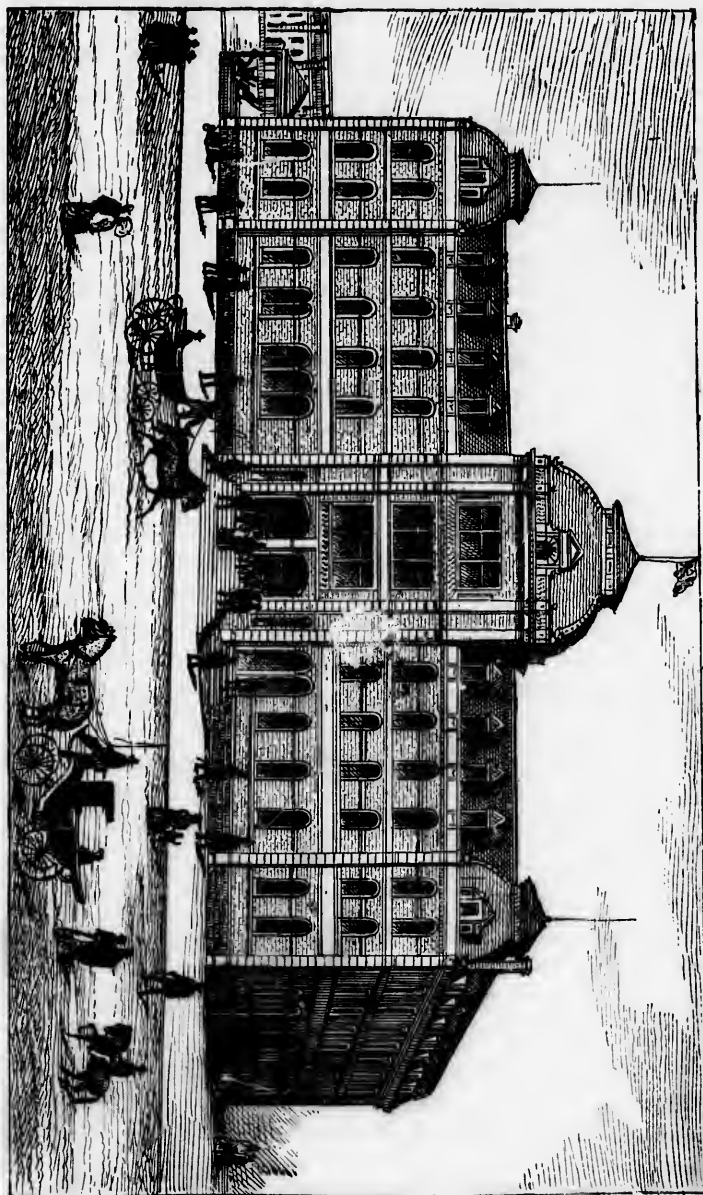
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Land Commissioner, Chief Engineer, Superintendent, and other officials of the Canadian Pacific Railway Company. Buildings of a substantial character, commensurate with the Company's position in the country, will be erected at an early day. A large reservation has been granted for such purposes as yards, switching grounds, and work shops, in a central locality.

The Manitoba and South-Western Colonization and Railway Company have also their chief offices in this city. Their grounds adjoin those of the Canadian Pacific Company. It is generally understood that this line is now controlled by the Oregon and Transcontinental Railway and Navigation Company, of which Henry Villard, of New York, President of the Northern Pacific Railway Company, is the largest shareholder. This company is wealthy, and ere long will have a heavy traffic over their road, as it is constructed through the most fertile part of the Province.

As may be supposed the postal facilities of Winnipeg and the North-West were for a long time limited. Long ago the inhabitants had to be content with a mail twice a year, one in summer by way of Hudson Bay and York Factory, the other overland by dog train, during the winter. As the railways in the United States approached nearer the boundary line, in 1869 and 1870, a weekly mail was received *via* Pembina. In 1871 a stage line was established between Moorhead and Winnipeg, when a tri-weekly mail was received, which in the year following increased to a daily one. This continued until the opening of the Pembina Branch, when the mails were received by rail. Since that time the business of the Winnipeg Post-Office has rapidly increased, doubling every year, until last year, when, it almost trebled that of the previous twelve months. The post office accommodation proved altogether inadequate for the amount of business, and a large temporary addition was made. This did much to facilitate

business. Still the accommodation is altogether insufficient, and it is expected that shortly the Government will erect a new building.

The leading Secret Societies are fully represented in Winnipeg. The first lodge of Free Masons called the "Northern Light Lodge," was established in 1864. Odd-Fellows, Foresters and Orange Societies are also strong. The Grand Lodges of all these institutions meet in Winnipeg.

The national societies of St. George, St. Andrew, and St. Patrick are also flourishing institutions. They all have excellent rooms, where the members meet and where fellow-countrymen are made welcome. These Societies have been of great benefit in imparting information to those coming to settle in the country, and in relieving the distressed.

A Sanitary Association has been formed, having for its object the proper drainage of the city. The Hudson's Bay Company have made a grant of \$500 to the Association, and it is proposed to engage the services of a competent Sanitary Engineer to report on the necessities of the place.

There are two excellent clubs in the city. The Manitoba Club, established in 1874, is a non-political institution, with a membership of over 150. It has recently removed to a handsome new building on Garry street, which, with furniture, cost about \$20,000. The Selkirk Club (Conservative) was organized in 1880, and is in a prosperous condition. They occupy premises on Thistle street, but steps are being taken for the erection of a building.

The Press of Winnipeg is a credit to the city. The "Free Press," is a large and influential morning paper, ably conducted by Messrs. Kenny and Luxton. It is the organ of the Liberal party, and was established in 1872. The "Times," the organ for the Conservative party, established in 1878, has been under the present management of

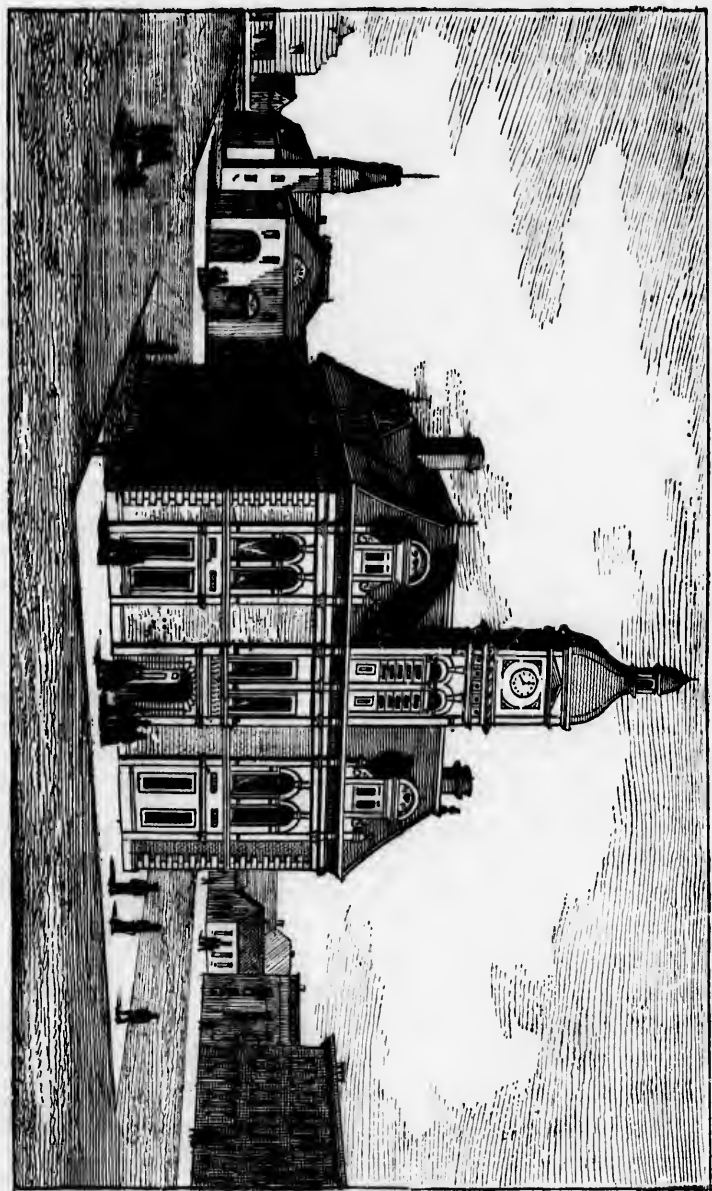
Messrs. Rowe & Co., since 1880, and is an excellent journal. The "Sun," an evening paper, has been only a few months in existence, but has every prospect of a prosperous career. The two first mentioned publish weekly editions as well. The two pioneers in journalism in the North-West were Messrs. Wm. Buckingham and Wm. Caldwell. The former is well-known to the public, from having, during Mr. Mackenzie's Administration, occupied the position of Private Secretary to the Premier. The latter is still a resident of Winnipeg, and has been more or less connected with various newspaper ventures. In 1859 these gentlemen arrived in Winnipeg, having brought their printing press and material in ox carts all the way from St. Paul, across the prairie. Their paper was called the "Nor-Wester." It continued to exist for a number of years, changing proprietors several times. Other ventures on the journalistic sea have been made, some of which lived for years, while others were ephemeral. Besides the newspaper offices, there are several well organized job offices in the city.

The Provincial Agricultural Society has its head-quarters in Winnipeg. It dates its establishment as far back as 1871, and is now a very prosperous institution. The Society receives an annual grant from the Government of \$2,000; this, with members' subscriptions and generous donations from private parties, enables it to offer liberal prizes. The exhibition is held at different points in the Province. Correspondence is kept up with the various Electoral Division Societies, whose exhibitions they encourage by offering special prizes and diplomas. The Society also offers prizes from time to time for essays on subjects pertinent to Agriculture. This is a feature which might well be imitated by societies in the older Provinces of the Dominion. The Government has promised to the society a grant of twenty-five acres of land in the city, on which it is proposed to erect permanent buildings for exhibition purposes. The

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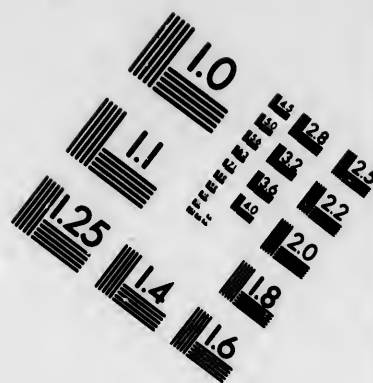
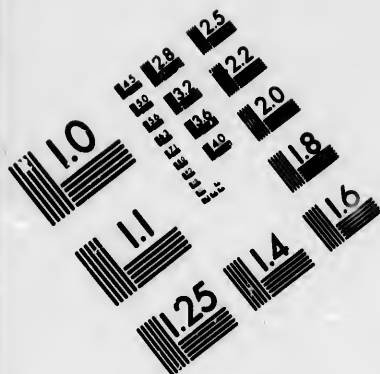
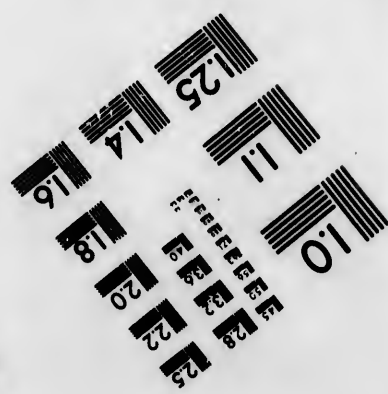
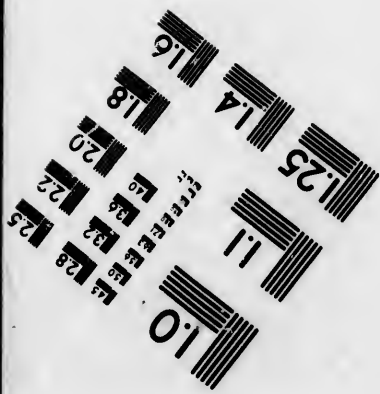
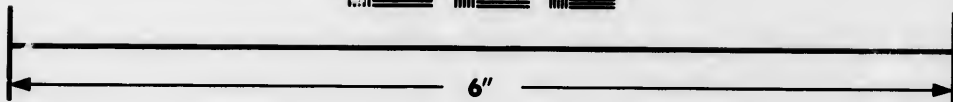
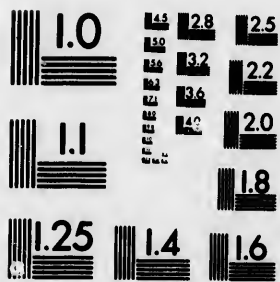


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energetic Secretary of the Society is Mr. C. Acton Burrows. Nothing need be said here with reference to the Church and the higher education of Winnipeg and the country, as an appendix is to be devoted to these subjects.

As it may prove of interest to the reader we cannot close this chapter without quoting some of the remarks made by Lord Dufferin, Governor-General of Canada, during his visit to the city in August, 1877. In answer to the civic address presented by the city, he said :—

“I beg to thank you most warmly for the kind and hearty welcome you have extended to me, on my arrival in your flourishing city, which you rightly designate the metropolis of the North-West, the living centre which is destined to animate with its vital energies the rich alluvial region whose only limit seems to be an ever-receding horizon.....I am not by any means unacquainted with the record of your achievements; indeed, it is probable that there is no Province in the Dominion with whose situation I am better acquainted, so far as information in such respects can be obtained from books and Parliamentary papers; and it is to perfect verify, and extend that knowledge by personal intercourse with your leading citizens, and by an inspection of the richness of your territory, that I have come amongst you.....I have no doubt that this city and Province generally, nay, the whole territory of the North-West, is now illuminated by the dawn of a great advancement. Although it may not be my good fortune personally to preside much longer over your destinies, I need not assure you that your future will always command my warmest sympathies and continue to attract my closest attention; and I trust that, though at a distance, I may live to see the fulfilment of many of your aspirations.”

On the occasion of the vice-regal visit drawing to a close, the citizens of Winnipeg invited His Excellency to a public banquet, at which he made a speech in review of his per-

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sonal observations of the country, and the facts he had gathered, from which the following are extracts :

"From its geographical position, and its peculiar characteristics, Manitoba may be regarded as the keystone of that mighty arch of sister Provinces which spans the continent from the Atlantic to the Pacific. It was here that Canada, emerging from her woods and forests, first gazed upon her rolling prairies and unexplored North-West, and learnt as by an unexpected revelation that her historical territories of the Canadas, her eastern seaboard of New Brunswick, Labrador, and Nova Scotia, her Laurentian lakes and valleys, corn lands and pastures, though themselves more extensive than half a dozen European kingdoms, were but the vestibules and antechambers to that till then undreamt of Dominion, whose illimitable dimensions alike confound the arithmetic of the surveyor and verification of the explorer.

"It was here that, counting her past achievements as but the preface and prelude to her future exertions and expanding destinies, she took a fresh departure, received the afflatus of a more imperial inspiration, and felt herself no longer a mere settler along the banks of a single river, but the owner of half a continent, and in the magnitude of her possessions, in the wealth of her resources, in the sinews of her material might, the peer of any power on the earth.

"In a recent remarkably witty speech, the Marquis of Salisbury alluded to the geographical misconceptions often engendered by the smallness of the maps upon which the figure of the world is depicted. To this cause is probably to be attributed the inadequate idea entertained by the best educated persons of the extent of Her Majesty's North American possessions. Perhaps the best way of correcting such a universal misapprehension would be a summary of the rivers which flow through them, for we know that as a poor man cannot afford to live in a big house, so a small country cannot support a big river. Now, to an English-

man or a Frenchman, the Severn or the Thames, the Seine or the Rhone, would appear considerable streams, but in the Ottawa, a mere affluent of the St. Lawrence, an affluent, moreover, which reaches the parent stream six hundred miles from its mouth, we have a river nearly five hundred and fifty miles long, and three or four times as big as any of them.

“ But, even after having ascended the St. Lawrence itself to Lake Ontario, and pursued it across Lake Huron, the Niagara, the St. Clair, and Lake Superior to Thunder Bay, a distance of one thousand nine hundred miles, where are we ? In the estimation of the person who has made the journey, at the end of all things ; but to us who know better, scarcely at the commencement of the great fluvial systems of the Dominion ; for, from that spot—that is to say, from Thunder Bay—we are able at once to ship our astonished traveller on to the Kaministiquia, a river of some hundred miles long. Thence, almost in a straight line, we launch him on to Lake Shebandowan and Rainy Lake and River—whose proper name by-the-by is “ Róné,” after the man who discovered it—a magnificent stream three hundred yards broad, and a couple of hundred miles long, down whose tranquil bosom he floats into the Lake of the Woods, where he finds himself on a sheet of water which, though diminutive as compared with the inland seas he has left behind him, will probably be found sufficiently extensive to render him fearfully sea-sick during his passage across it. For the last eighty miles of his voyage, however, he will be consoled by sailing through a succession of land-locked channels, the beauty of whose scenery, while it resembles, certainly excels the far-famed Thousand Islands of the St. Lawrence.

“ From this lacustrian paradise of sylvan beauty, we are able at once to transfer our friend to the Winnipeg, a river whose existence in the very heart and centre of the conti-

ment is in itself one of nature's most delightful miracles, so beautiful and varied are its rocky banks, its tufted islands; so broad, so deep, so fervid is the volume of its waters, the extent of their lake-like expansions, and the tremendous power of their rapids.

"At last let us suppose we have landed our traveller at the town of Winnipeg, the half-way house of the continent, the capital of the Prairie Province, and I trust the future "umbilicus" of the Dominion. Having had so much of water, having now reached the home of the buffalo, like the attenuated Falstaff, he naturally "babbles of green fields" and careers in imagination over the primeval grasses of the prairie. Not at all. Escorted by Mr. Mayor and the Town Council, we take him down to your quay, and ask him which he will ascend first, the Red River or the Assiniboine, two streams, the one five hundred miles long, the other four hundred and eighty, which so happily mingle their waters within your city limits.

"After having given him a preliminary canter upon these respective rivers, we take him off to Lake Winnipeg, an inland sea three hundred miles long and upward of sixty broad, during the navigation of which for many a weary hour he will find himself out of sight of land, and probably a good deal more indisposed than ever he was on the Lake of the Woods, or even the Atlantic.

"At the northwest angle of Lake Winnipeg he hits upon the mouth of the Saskatchewan, the gateway and high road to the North-West, and the starting point to another one thousand five hundred miles of navigable water flowing nearly due east and west between its alluvial banks.

"Having now reached the foot of the Rocky Mountains our "Ancient Mariner"—for by this time he will be quite entitled to such an appellation—knowing that water cannot run up hill feels certain his aquatic experiences are concluded. He was never more mistaken. We immediately

launch him upon the Athabasca and Mackenzie Rivers, and start him on a longer trip than he has yet undertaken—the navigation of the Mackenzie River alone exceeding two thousand five hundred miles. If he survives this last experience, we wind up his peregrinations by a concluding voyage of one thousand four hundred miles down the Fraser River; or, if he prefers it, the Thompson River to Victoria, in Vancouver, whence, having previously provided him with a first-class return ticket for that purpose, he will probably prefer getting home *via* the Canadian Pacific.

“Now, in this enumeration, those who are acquainted with the country are aware that for the sake of brevity I have omitted thousands of miles of other lakes and rivers which water various regions of the North-West—the Qu’Appelle River, Belly River, Lake Manitoba, the Winnipegosis, Shoal Lake, etc., etc., along which I might have dragged and finally exterminated our way-worn guest—but the sketch I have given is more than sufficient for my purpose; and when it is further remembered that the most of these streams flow for their entire length through alluvial plains of the richest description, where year after year wheat can be raised without manure, or any sensible diminution in its yield, and where the soil everywhere presents the appearance of a highly-cultivated suburban kitchen garden in England, enough has been said to display the agricultural richness of the territories I have referred to, and the capabilities they possess of affording happy and prosperous homes to millions of the human race.

“But in contemplating the vistas thus opened to our imagination, we must not forget that there ensues a corresponding expansion of our obligations. For instance, unless great care is taken we shall find, as we move westwards, that the exigencies of civilization may clash injuriously with the prejudices and traditional habits of our Indian fellow-subjects.

"Happily in no part of Her Majesty's dominions are the relations existing between the white settlers and the original natives and masters of the land so well understood or so generously and humanely interpreted as in Canada, and, as a consequence, instead of being a cause of anxiety and disturbance, the Indian tribes of the Dominion are regarded as a valuable adjunct to our strength and industry.

"Wherever I have gone in the Province—and since I have been here, I have travelled nearly a thousand miles within your borders—I have found the Indians upon their several reserves, pretermittting a few petty grievances of a local character they thought themselves justified in preferring—contented and satisfied, upon the most friendly terms with their white neighbors, and implicitly confiding in the good faith and paternal solicitude of the Government.

"There is no doubt that a great deal of the good feeling thus subsisting between the red men and ourselves is due to the influence and interposition of that invaluable class of men, the Half-breed settlers and pioneers of Manitoba, who, combining as they do the hardihood, the endurance, and love of enterprise generated by the strain of Indian blood within their veins, with the civilization, the instruction, and intellectual power derived from their fathers have preached the Gospel of peace and good-will, and mutual respect, with equally beneficent results to the Indian chieftain in his lodge and to the British settler in his shanty.

"Nor can I pass by the humane, kindly, and considerate attention which has ever distinguished the Hudson's Bay Company in its dealings with the native population. But though giving due credit to these fortunate influences amongst the causes which are conducing to produce and preserve this fortunate result, the place of honor must be adjudged to that honorable and generous policy which has been pursued by successive Governments towards the Indians of Canada, and which at this moment is being

superintended and carried out with so much tact, discretion and ability by your present Lieutenant-Governor, under which the extinction of the Indian title upon liberal terms has invariably been recognized as a necessary preliminary to the occupation of a single square yard of native territory.

"But our Indian friends and neighbors are by no means the only alien communities in Manitoba which demand the solicitude of the Government and excite our sympathies and curiosity.

"In close proximity to Winnipeg two other communities—the Mennonites and Icelanders—starting from opposite ends of Europe, without either concert or communication, have sought fresh homes within our territory; the one of Russian extraction, though German race, moved by a desire to escape from the obligations of a law which was repulsive to their conscience—the other, bred amid the snows and ashes of an Arctic volcano, by the hope of bettering their material condition.

"Although I have witnessed many sights to cause me pleasure during my various progresses through the Dominion, seldom have I beheld any spectacle more pregnant with prophecy, more fraught with promise of a successful future, than the Mennonite settlement. When I visited these interesting people they had only been two years in the Province, and yet in a long ride I took across many miles of prairie, which but yesterday was absolutely bare, desolate and untenanted, the home of the wolf, the badger and the eagle, I passed village after village, homestead after homestead furnished with all the conveniences and incidents of European comfort and a scientific agriculture, while on either side the road corn-fields already ripe for harvest and pastures populous with herds of cattle stretched away to the horizon.

"Even on this continent—the peculiar theatre of rapid change and progress—there has nowhere, I imagine, taken

place so marvellous a transformation; and yet, when in your name, and in the name of the Queen of England, I bade these people welcome to their new homes, it was not the improvement in their material fortunes that pre-occupied my thoughts. Glad as I was of having the power of allotting them so ample a portion of our teeming soil—a soil which seems to blossom at a touch, and which they were cultivating to such manifest advantage—I felt infinitely prouder in being able to throw over them the ægis of the British Constitution, and in bidding them freely share with us our unrivalled political institutions, and our untrammelled personal liberty.

“We ourselves are so accustomed to breathe the atmosphere of freedom that it scarcely occurs to us to consider and appreciate our advantages in this respect. It is only when we are reminded, by such incidents as that to which I refer, of the small extent of the world’s surface over which the principles of Parliamentary Government can be said to work smoothly and harmoniously, that we are led to consider the exceptional happiness of our position.

“Nor was my visit to the Icelandic community less satisfactory than that to our Mennonite fellow-subjects. From accidental circumstances I have been long since led to take an interest in the history and literature of the Scandinavian race, and the kindness I once received at the hands of the Icelandic people in their own island, naturally induced me to take a deep interest in the welfare of this new immigration.

“When we take into account the secluded position of the Icelandic nation for the last thousand years, the unfavorable conditions of their climate and geographical situation, it would be unreasonable to expect that a colony from thence should exhibit the same aptitudes for agricultural enterprise and settlement as would be possessed by a people fresh from intimate contact with the higher civilization of Europe.

"In Iceland there are neither trees, nor cornfields, nor highways. You cannot, therefore, expect an Icelander to exhibit an inspired proficiency in felling timber, ploughing land, or making roads, yet unfortunately these are the three accomplishments most necessary to a colonist in Canada. But though starting at a disadvantage in these respects, you must not underrate the capacity of your new fellow-countrymen. They are endowed with a great deal of intellectual ability, and a quick intelligence. They are well educated. I scarcely entered a hovel at Gimli which did not possess a library.

"They are well-conducted, religious and peaceable. Above all they are docile and anxious to learn. Nor, considering the difficulty which prevails in this country in procuring women servants, will the accession of some hundreds of bright, good-humoured, though perhaps inexperienced, yet willing, Icelandic girls, anxious for employment, be found a disadvantage by the resident ladies of the country. Should the dispersion of these young people lead, in course of time, to the formation of more intimate and tenderer ties than those of mere neighbourhood between the Canadian population and the Icelandic colony, I am safe in predicting that it will not prove a matter of regret on the one side or the other.

"And, gentlemen, in reference to this point, I cannot help remarking with satisfaction on the extent to which a community of interests, the sense of being engaged in a common undertaking, the obvious degree in which the prosperity of any one man is a gain to his neighbours, has amalgamated the various sections of the population of this Province, originally so diverse in race, origin, and religion, into a patriotic, closely-welded, and united whole.

"In no part of Canada have I found a better feeling prevailing between all classes and sections of the community. It is in a great measure owing to this widespread sentiment

of brotherhood that on a recent occasion great troubles have been averted, while at the present moment it is finding its crowning and most triumphant expression in the establishment of a University under conditions which have been found impossible of application in any other Province of Canada—I may say in any other country in the world—for nowhere else, either in Europe or on this continent, as far as I am aware, have the bishops and heads of the various religious communities into which the Christian world is unhappily divided, combined to erect an *Alma Mater* to which all the denominational colleges of the Province are to be affiliated and whose statutes and degrees are to be regulated and dispensed under the joint auspices of a governing body in which all the churches of the land will be represented.

“An achievement of this kind speaks volumes in favour of the wisdom, liberality, and Christian charity of those devoted men by whom in this distant land the consciences of the population are led and enlightened, and long may they be spared to see the efforts of their exertions and magnanimous sacrifices in the good conduct and grateful devotion of their respective flocks. Nor, I am happy to think, is this good fellowship, upon which I have so much cause to congratulate you, confined either within the limits of the Province or even within those of the Dominion.

“In a word, apart, secluded from all extraneous influences, nestling at the feet of her majestic mother, Canada dreams her dream, and forbodes her destiny—a dream of ever-broadening harvests, multiplying towns and villages, and expanding pastures; of page after page of honorable history added as her contribution to the annals of the Mother Country and to the glories of the British race; of a perpetuation for all time upon this continent of that temperate and well-balanced system of Government which combines in one mighty whole, as the eternal possession of all Englishmen, the brilliant history and the traditions of the past,

with the freest and most untrammelled liberty of action in the future.

"Most heartily do I congratulate you upon all that you are doing, and upon the glorious prospect which is opening out on every side of you. Though elsewhere in the Dominion stagnation of trade and commerce has checked for a year or two the general advance of Canada, here at least you have escaped the effects of such sinister incidents, for your welfare being based upon the most solid of all foundations, the cultivation of the soil, you are in a position to pursue the even tenor of your way untroubled by those alternations of fortune which disturb the world of trade and manufacture. You have been blessed with an abundant harvest, and soon, I trust, will a railway come to carry to those who need it the surplus of your produce, now, as my own eyes have witnessed, imprisoned in your storehouses for want of the means of transport. May the expanding finances of the country soon place the Government in a position to gratify your just and natural expectations."

The Winnipeg of to-day—as is well evidenced by what we have already said of its rise and progress—forms a marked contrast to that of a few years ago. Its progress has been such as scarcely to be credited by those who have not been actual witnesses of its wonderful growth.

To the new-comer, from the older Provinces of the Dominion, or the old countries of Europe, for the first time setting foot in this metropolis of the great North-West, the appearance of the city, the scenes witnessed on its crowded thoroughfares, and in its still more crowded hotels and places of resort and business, are striking and novel. Stepping from the crowded train at the railway station, or from the steamer at the landing, a short walk brings the traveller to the principal thoroughfare of the city. At the places of debarkation, on the arrival of train or boat, all is bustle and excitement. Cabmen and "bus"

drivers ply their vocation with lungs as lusty, and with as much assiduity as in the older cities. Immense piles of baggage almost block up every available space. Speculators with long purses rub shoulder to shoulder, amid the jostling throng upon the crowded platform, with those in less independent circumstances, who have come to carve out a home by the labor of their hands and the sweat of their brow. If the traveller arrive during the winter season—and if the weather be favorable—he will find the fine wide streets of the city crowded with conveyances of all descriptions—magnificent turnouts with coachmen and footmen fully equipped; less pretentious rigs, not so grand as those of the nabobs, but the very essence of comfort withal; farmers from the adjacent country with spanking teams, in many cases brought with them from the east; natives with a procession of ox-sleds, laden with wood or produce, going to or returning from market. The sleds are as a rule drawn by a single member of the bovine race, but harnessed in “shaganappi” and altogether in a more comfortable way equipped for draft than with the old fashioned wooden yoke of by-gone days. Shaganappi, it might be well to explain here, is the name given to the raw buffalo hide from which the ox harness is made. Now and then dog trains, either starting out or returning from long trips to the far west, pass by at a rapid rate. There are usually from six to eight dogs attached to a toboggan; and their continual yelping, together with the shouting of the Indian or Half-breed driver, make up a scene at once novel and picturesque.

On the sidewalks the excitement that generally prevails attracts attention, and the student of human nature finds ample scope for the exercise of his *penchant*. Men, old and young, hurry along with anxious look—eagerly intent on business—and, as a rule, a roll of plans under the arm or a note book in the hand may be detected. Some who may have done a good day's business and added a few

thousands to their capital, have a satisfied appearance, while others, whose properties may be a little slow in moving, appear in a corresponding degree despondent. The real estate offices—of which the number is legion—are thronged from early morn till late in the night. The maps and plans displayed to view are a constant subject of study, and transactions involving thousands of dollars are made and settled up with a promptness and rapidity that would surprise the more slowgoing and cautious people of other and older countries. In this great turmoil of business, men of all nationalities meet—for what country or clime is not represented in this grand gathering of the nations in this new country?

A noticeable feature on the streets, and it is even more discernible in the churches, is the large preponderance of the male population. At the time of writing it is calculated that two-thirds of the population of the city are males. This is, of course, accounted for by the fact that the recent influx of immigration has consisted very largely of young unmarried men, who have come here to seek their fortune before entering into matrimonial bonds. There are also many who have left their families in Ontario or elsewhere until spring, by which time they expect to become permanently settled. To attend one of the large churches of the city is to witness a sight not to be seen out of Winnipeg. They are crowded to the door—and the vast congregation is composed of the very bone and sinew of other lands—strong men with will and determination stamped upon every feature, and in the majority of cases comfortably situated financially. Such audiences must inspire any man who rises to address them. The people of Winnipeg are eminently a church-going community. On the Sabbath morn, except when the bells in the church towers call the citizens forth to worship, the streets are very quiet, and from then until the hour of dismissal the same quiet prevails.

There are other novel features in this wonderful city. The old aborigines are not by any means extinct, and now and then one meets an Indian mother—a representative of a fast departing race—her papoose strapped tightly on her back, and covered with a blanket, the little urchin as a rule indicating very unmistakable objections to such close confinement by violent protestations audible from underneath its woollen protection.

The almost entire absence of pauperism, or anything approaching to squalor, is a noticeable feature of life in Winnipeg. Every one from the laboring man up is well and comfortably clad, and seems to be perfectly satisfied with the country in which his lot has been cast. This statement is corroborated by the fact that during the past year the City Council were required to expend less than \$150 for charitable purposes.

In the evening after the stores and other places of business are closed, the hotels and real estate auction rooms are the centres around which the great mass of the people congregate. Every large hotel has a real estate office in connection with it. The excitement then is even more intense than during the day—and many of the largest transactions then take place. The auction rooms are generally crowded, and the amount of property sometimes disposed of is very large. There mechanics and workingmen, whose time is otherwise occupied during the day, mingle with those whose only business is to speculate, and venture a portion of their hard earned savings in a piece of Manitoba earth, which often in the course of a few days realizes the purchaser a handsome profit. The whole community seems to be permeated with a desire for speculation. Scarcely one in the city but has benefitted somewhat by the "boom" that has existed, and in many cases a very satisfactory nucleus for a future competence, has accrued to the fortunate investor. All who come are satisfied that the prospects are great, and many

doubting Thomases who came to see, remained to buy. In a week or two they are deep in the maelstrom of land speculation.

Socially, Winnipeg may be said to be as near what it ought to be as any city in existence. People of all classes and creeds, natives and foreigners, alike work together in perfect accord, with a single aim to further the resources of the great country tributary to it.

And thus are Winnipeg and the North-West working out their manifest destiny.

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CHAPTER XXVIII.

Churches and Schools in the North-West.

[A CHAPTER WRITTEN BY G. M. GRANT, D.D., PRINCIPAL OF QUEEN'S UNIVERSITY,
KINGSTON, ONT.]

First Settlers in Manitoba Presbyterianism—Their Piety—Attachment to the Church of their Fathers—First Anglican Missionaries—Their Zeal and Prudence—Highland Tenacity—Arrival of Rev. John Black—Kildonan Church—Roman Catholic Missions—Establishment of Churches and Schools by Missionaries from the Church of England—Rupert's Land Divided into Four Dioceses—One Episcopal Church for Canada—Methodist Missionaries—Rev. George Macdougall—Rev. George Young—Methodist Churches in Winnipeg—Missions of the Presbyterian Church—Knox and St. Andrew's Churches—A Common Mission Board for the Protestant Churches Required—First School Act—Its Provisions and Amendments on it—Educational Development—Difficulties Caused by Sparse Settlement—High School Work—Colleges—St. Boniface—St. John's—Manitoba College—Manitoba University—Harmonious Co-operation in it of all Churches and Colleges—Happy Solution of Difficulties Considered Insurmountable Elsewhere—Omens for the Future. Roman Catholic Missions, by Archbishop Tache's Secretary—Missions of St. Boniface—East St. Boniface—Colleges—Charitable Institutions.

THE celebrated book on snakes in Ireland commenced with the words "There are no Snakes in Ireland." Had a chapter on churches and schools in the North West been written half a century ago it would have opened in much the same way. But now, with regard to churches and schools, Manitoba styles herself the "Banner Province of the Dominion." Our young sister in the North-West has not had to pass through the initial era of social chaos, that characterised the history of many of the Western States. Her immigrants at the first were a God-fearing people, and so in the main they have always been and still are. Avoiding opposite fanaticisms in education, she has escaped the Scylla of sectarianism, and the Charybdis of anti-sectarianism. The settler is not expected to come without a live coal from his own venerated altar-fires, and he and his neighbors may well build school-houses, for one-eighteenth of the land has been set apart as an endowment for the schoolmaster.

The Highlanders, whom the Lowland Earl of Selkirk brought from Scotland in 1812 and 1816, were Presbyterians. Religion was the principle of their lives, and their religion was inextricably bound up with the simple forms of the Church of their fathers. They would not have left their mountains and glens for the prairies that, Lork Selkirk told them, were ready for the plough in the heart of an unknown continent, had he not promised that a minister of their church would accompany them to their new home. His Lordship arranged that the son of the parish minister of Resolis should go with them. At the last moment the young licentiate drew back, and the colonists had to set out with a lay catechist, one of the class emphatically styled "the men," as their spiritual guide. This lay missionary, James Sutherland by name, did his duty faithfully while with them, but the hostile influences of the North-west Company secured his removal after a few years, and the pious Highlanders were left with no man to care for their souls. They had, however, resources within themselves, and these did not fail them. They had their Gaelic Bibles, and could read them. Family worship was observed as regularly as the sun rose and set. They sang the psalms of David in Gaelic to those plaintive tunes that reach to the very marrow of the Highland nature, and prayed as men pray who believe that the living God can be moved by prayer. It might be supposed that men who could pray in public extempore, and exhort with an amazing combination of doctrinal knowledge and emotional fervor, would come to feel themselves independent of ministers of religion. Not at all. No men revere the ministerial office more than Highlanders. Consequently, as no minister of their own persuasion came to the distant Red River of the North, the settlers gave a hearty welcome to the missionaries of the Church of England. The Rev. John West, who arrived in 1820, was the first of these. He was succeeded by the Rev.

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D. T. Jones. These men, and those who followed, did all that could be done to attach the Scotchmen to Anglican forms. They used Rouse's version of the Psalms, and held one of the services in the church on the Lord's Day according to the Presbyterian form. In 1846, the Bishopric of Rupert's Land, embracing the vast area from the Coast of Labrador to the Rocky Mountains, was founded, and the Reverend Mr. Anderson, a Scotchman, was its first bishop. He resigned in 1864, and another Scotchman, Bishop Machray, succeeded him. But, though the Highlanders attended their ministrations, and were married and had their children baptized according to the Anglican mode, they clung to the memory of the Church of their Fatherland. Those simple forms styled bald and cold by æsthetical religionists had a singular charm for those spiritually minded men, and they clung with extraordinary tenacity to the hope of some day seeing among them a minister of their own Church. I know nothing of the kind in recent Church History more touching than this fidelity, that no neglect and no disappointments could chill. Here are the words, taken from an affidavit made by them, in which they state how bootless all their efforts had been:—"Over and over again have we applied to every governor in the colony since its commencement, to Mr. Halkett, also to his lordship's kinsman, and to the Governor-in-Chief of Rupert's Land; and time after time petitioned the men in power among us; but all to no effect." The Church of England had done more than its duty, but the Church of Scotland seemed deaf. At length, the Canada Presbyterian Church heard their cry, and in 1852 sent the Rev. John Black to minister to them. We travel from Toronto to Winnipeg in two or three days. Thirty years ago, it took Mr. Black eight weeks to make the journey. And, had it not been for the aid of Governor Ramsay of Minnesota, the young minister would have been longer on the road. Illinois mud was as bad as Manitoba mud is now.

The Highlanders welcomed Mr. Black with a Highland welcome. Their eyes saw the teacher they had longed to see. In one day, three hundred left the Episcopal Church, without reproach on the part of the Bishop, and with no feelings in their hearts for him save gratitude and respect. Soon, manse and school-house and the stone church of Kildonan were built. The steeple rose into the air, a sign seen from afar on the level prairie ever since. "There!" exclaimed the mason as he gazed on the solid structure with loving eyes, "keep pouter and ill hands aff her, and she 'll stand for a hunner years and mair!"

During the next fifteen years nothing more was done by the Presbyterian Churches for the religious development of the North-west. Mr. Black was Presbyter and Bishop. He alone represented the cause of the old blue banner and he did it in a way that secured for him the affection and respect of all men. His congregation dwelt on the banks of the Red River, from Fort Garry downwards. Ribands of land extending from the river away into the prairie, "as far distant as could be seen from under a horse's belly," had been given to the immigrants. This distance was supposed to be two miles, but two miles more were claimed as a reserve for hay, and the claim was subsequently allowed. Each immigrant had a river frontage, and the houses were built along the river bank. This system of colonization, which resembled the old French settlements on the St. Lawrence and its tributaries, gave an appearance of dense population, very different from that picture of loneliness now commonly presented to the eye, of vast prairies dotted here and there with small and mean-looking houses. It was admirably adapted for the cultivation of good fellowship among neighbors, but put good farming out of the question. A line of block houses extended down the banks of the Red River. Cultivated fields gradually broke in upon that undeviating monotony which the virgin prairie had maintained for

countless centuries. Those same fields have raised wheat continuously ever since. Crofters, ejected by Highland lairds who thought more of red deer and grouse than of the old sons of the grand Scottish mountains, disbanded soldiers and retired servants of the Hudson's Bay Company, joined themselves from year to year to their countrymen at Kildonan. The settlement grew in importance, and in 1871 when the Presbyterian Church of Canada decided that Manitoba required an institution that would be in itself both high school and College, they erected the building not in Winnipeg, but beside the stone Kirk of Kildonan.

The honour of having cared for the religious interests of the North-West in its early days must be assigned to the Roman Catholic and Anglican Churches. The Methodist Church entered the field next. Nothing need be said here concerning the Roman Catholic Missions, as a special portion of this chapter has been assigned to them. Too much praise can hardly be given to the Church of England, especially when its zeal is compared with the inactivity of the Scottish Church. True, the Church of Scotland puts in the plea of ignorance as its defence; and the fact that the petition of the Kildonan settlers for a minister, sent home through the Hudson's Bay Company, came back a year or two after in a butter tub, throws a significant light on the subject. At any rate, Anglican missionaries did come, and they were good men. Not confining themselves to the white population of the Red River, they devoted their attention to the English-speaking Half-breds wherever a nucleus of them was to be found, and also to the Indians as far north as the forts on the frozen shores of Hudson's Bay, and the unutterably lonely posts on the distant Mackenzie River. They built churches and schools, and formed congregations. Previous to the passing of the School Law in 1871, almost all the schools that existed within and beyond the province were and had been from the first in connection with the Anglican Missions.

They were supported, in whole or part, by the Church Missionary Society or by grants from the Diocesan Fund. This fund being small, grants could not be made in every case of need. And, in not a few cases the clergymen, unable to get assistance, voluntarily undertook the laborious duties of school teaching, without remuneration, in addition to their proper work.

On the resignation of Bishop Anderson, Bishop Machray ruled episcopally over the whole North-west. His patriarchate is now divided into four dioceses,—Rupert's Land with nearly thirty clergymen, at least one-third of these being Missionaries to the Indians and Half-breeds; and Moosonee, Saskatchewan, and Athabasca, with about twenty clergymen between them, all more or less engaged in similar mission work. Bishop McLean of Saskatchewan has undergone great labor in enlisting the sympathies of his Church, in England and in Canada, on behalf of his diocese. Preaching, lecturing, and collecting money wherever he goes, he has raised an endowment for his bishopric, built Emmanuel College at Prince Albert, in which several full-blooded Crees are under training for the holy ministry, and secured the salaries of several additional Missionaries and Catechists for his diocese. What seems to be needed now is that the dioceses of the North-west should be connected with the Church in Canada. Such affiliation would not lead to the withdrawal of the aid given by the English Missionary Societies, while it would quicken the interest felt in the work by Canadian Episcopalians. The people who go to the North-west from our older provinces should feel that they are going away neither from their own country nor their own Church. In the interest of patriotism and religion it is desirable that all the forces that mould the character of a people to high issues should be brought to bear upon the immigrants who are pouring into the North-west. May we therefore soon see one Episcopal Church of Canada, as one Presby-

terian and one Methodist Church now include the vast proportion of the people known by these designations. Certainly, so far as the North-west is concerned, no other Church has a better right than the Episcopal to claim an inheritance in the land.

At present, the Methodist and Presbyterian Churches are prosecuting religious work with wise liberality and forethought. The former had its missioneries in the country thirty years ago. Evans and Rundle, men of apostolic character and labours, were the pioneers. None of their successors have gone beyond the bounds to which they penetrated. George Macdougall followed in their steps, and established missions on and near the Saskatchewan at Morleyville, where his son is now labouring under the resplendent lights and shadows reflected from the long silver-tipped line of the Rocky Mountains, and at various other points where Indians were in the habit of congregating. He and Père Lacombe had extraordinary influence with the Indians, influence of which the Government availed itself on different occasions, and for the wise exercise of which the country is greatly their debtor. To-day, the Methodist Church has missions on the two Saskatchewan, all the way up to the Rocky Mountains; also, on the east side of Lake Winnipeg at Beren's River and Poplar River, and on the west side at Fisher River. At the northern end of the Lake their headquarters are established at Norway House. From that point, a chain of stations connected with Norway House or Oxford House extends down the Nelson River. Almost all the Indians in this part of the country are nominally Christians. Keep whiskey from them, and they are better Christians practically than average white men. Five or six hundred Indian church members are connected with Norway House and its stations. Sixty or seventy miles north of the bend of the North Saskatchewan, an important mission has been established at White-fish Lake.

Here, the clergyman, Rev. Mr. Steinhaur, is a full-blooded Ojibbway, and his Cree flock are gradually abandoning their nomadic habits and becoming farmers. A gratifying feature of mission-work in the North-west is the fact that the different Protestant Churches do not interfere with each other. They respect each other too much to compete for converts, even when there is a temptation in the way. For instance, last summer, a deputation of Indians from a district under the care of the Church of England requested the Methodist Superintendent to send them a minister. Inquiry was made at the proper quarter into the cause, and it being ascertained that the Indians had taken offence, because an erring but popular Half-breed clergyman had been disciplined, their request was courteously declined.

The Methodist Church of Canada is preparing to follow the stream of immigration with wonted energy. It has taken a comprehensive view of the whole country, and will send ministers to the most important points, and wherever its people call for the ordinances of religion to be dispensed to them according to the ritual to which they have been accustomed. In 1868, Rev. George Young arrived in Winnipeg, and made application to the H. B. Company for a site for a church and mission house. The Company, in accordance with its traditional policy of dealing liberally with all Churches, allowed him to select an acre from its reserve. He selected so judiciously that the site has now a frontage of 420 feet on Main Street. A neat church was erected, but a year or two ago the congregation, believing that they could worship in a less valuable locality, rented the church for worldly uses and built stores, along side, which bring in rent enough to maintain an Archbishop. The congregation betook itself to the Drill-shed, and then to a hall over the stores, until they should decide where to build a Metropolitan church. They own land on Notre Dame Street, but it also is becoming so valuable as a business site

that some think it a pity to waste it on a church. The second Methodist church is near Point Douglas. A valuable farm in West St. Boniface has been bequeathed recently by the Rev. D. Morrow, a minister of the Church, to enable it to establish a Denominational College, when the time comes for taking such a step. Both the Methodist and the M. E. Churches have already secured the necessary charters for Colleges. Everything indicates that the Methodist Church will take as prominent a place in Manitoba as it occupies in Ontario.

The Reverend Mr. Nesbit was the first missionary to the Indians sent out by the Canada Presbyterian Church. He established his headquarters at Prince Albert, on the North Saskatchewan, in 1866, and did good work until he died at his post in 1874. Prince Albert is destined to be an important centre, and the Church has therefore recently sent Rev. Mr. Sieveright, who is building at various points in the surrounding country with the zeal of a St. Boniface or Columbanus. The Presbyterian Church is atoning for past neglect by the energy which it has displayed in North-west work since its union in 1875. Their congregation in Winnipeg built, on Portage Avenue, Knox church, a beautiful specimen of Gothic architecture, whose tall graceful spire has ever since been the landmark of the city to travellers far out on the prairie. Knox congregation became so large that a number of its energetic young men determined to form a second congregation, to be called St. Andrews. They did so last year, parting from the parent congregation in the most friendly spirit. Both parties were actuated by a desire for the common good, and the mother congregation determined therefore to move away from the centre of the city to a site near Manitoba College, the better to divide Winnipeg into two parishes. The trustees, Kirk-session and congregation of Knox, instead of complaining of the loss they would sustain by the formation of the second congre-

gation, voted the offshoot \$10,000 towards the erection of their proposed new church, and subsequently when Knox was sold for a larger sum than was expected, the gift was increased to \$25,000. They do big things in the North-west. The size of the country may have its influence on the minds of the people. For instance, the members of Knox church contributed in 1881 between forty and fifty thousand dollars for religious and charitable objects. And in the first months of 1882, a new scheme for building churches and manses having been proposed, they subscribed towards it in a few days over \$20,000. All this in a city less than ten years old!

In the summer of 1881, the Presbyterian Church had thirty-eight ordained ministers and student catechists in the North-west. In 1882 it intends to have fifty. Ten years ago it had about a dozen preaching stations. Now it has over one hundred and fifty.

There is room in the North-west for all the Churches and for all that they can do. But where so much has to be done, an understanding is most desirable, to prevent collisions and cross firing. In Australia the Episcopal, Methodist, and Presbyterian Churches economize their strength and give practical proof of their underlying unity and brotherly spirit by an agreement not to interfere with each other's work in the Home mission field, and by the establishment of a board that endeavors to harmonize the action of the respective Churches. A joint committee that would organize a fair distribution of missionaries in our North-west would be an unspeakable blessing. Anyone who has had opportunities of seeing what communities become where no ministers of religion hold up a banner for God, morality and purity of life, would gladly sacrifice all the shibboleths of his sect to secure a resident clergyman in every settled township in the North-west. The very existence of a church in a community is a witness of higher things than the material. The

presence of a minister of religion is a guarantee of social order. The Presbyterian Church has recently taken a step that not only renders its own administration more prompt and effective, but facilitates the carrying out of a common understanding between different Churches. It appointed last year a Superintendent of missions for the whole North-west, and the presbytery or court constitutionally charged with the work that he has to do, far from viewing the new office with suspicion as an encroachment on its own jurisdiction, pressed for its creation. The Reverend James Robertson, pastor of Knox church, Winnipeg, was appointed Superintendent by the General Assembly. His capacity for organization and his knowledge of the country, especially of its religious and educational necessities, marked him out for the post to which he was appointed by unanimous consent.

Perhaps the most satisfactory chapter in the history of Manitoba is its peaceful and harmonious educational development. In every other province of the Dominion long and angry wars have been waged over common schools, academies and Colleges. Well may the province that has no history in this respect be called happy.

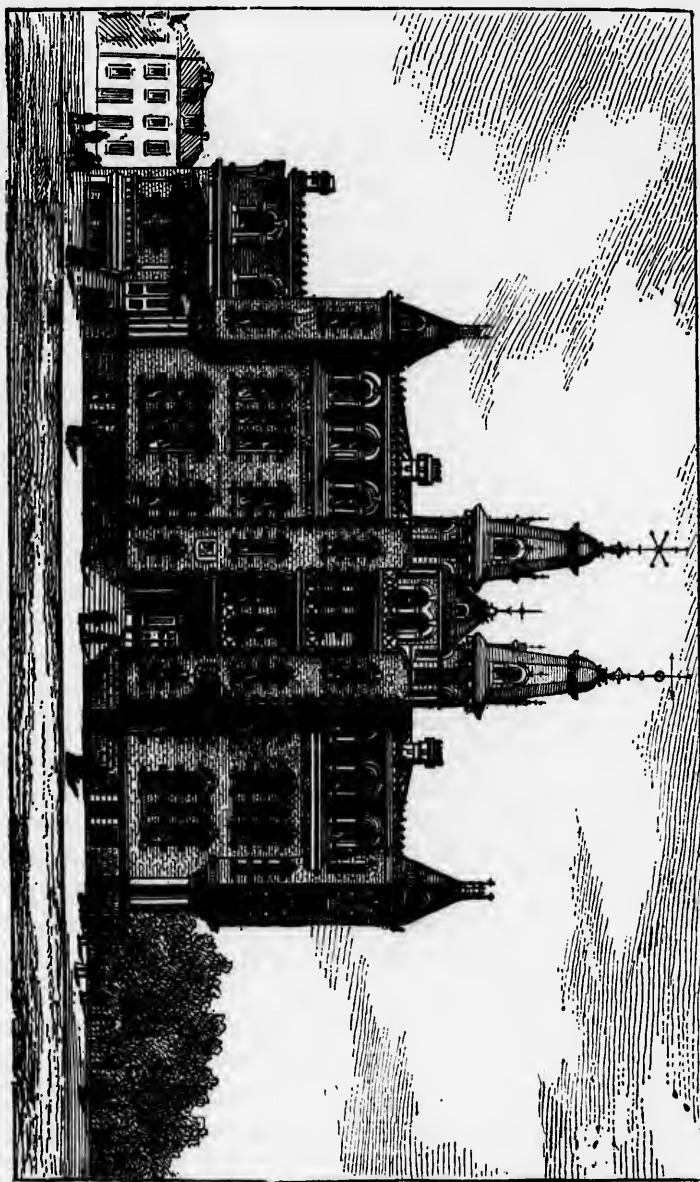
During the first session of the first parliament of Manitoba held in 1871, the act that is the basis of the present system of common school education was passed. The act has been amended from time to time, and there is now virtually a general school system connected with the municipal code introduced a year or two ago. A board of education, composed of Roman Catholic and Protestant sections, was established in 1871. The Reverend W. Cyprian Pinkham and Mr. Eli Tassé were appointed superintendents of the Protestant and Roman Catholic schools respectively. The Educational law from the first was based on the principle that the traditions, creeds and wishes of the people should be respected as far as could be done without impairing the efficiency of the schools. Ample powers were conferred on the Board of Ed-

ucation. To it were referred the examination and grading of teachers, the granting of diplomas, the selection of school books, and the control and discipline of the schools. The Provincial Government gave a liberal annual grant for education, which was divided between the Roman Catholic and Protestant sections, at first equally, and subsequently according to the number of scholars that the annual census showed to belong to each school. When settlers in any part of the province have among them enough children to make an average of ten, they may on petition to the Education Bureau be recognized as a school district. This done, they obtain a Government grant of at least \$200 a year for a teacher; and they can supplement this grant by voluntary subscriptions or by assessment. The spirit of the people has been shown by the general adoption of the principle of assessment. They elect trustees for the district, and these have power to erect a school-house, engage a teacher and obtain all school requisites. A great difficulty connected with both church and school attendance is the sparse settlement of the country. Even in the few cases where all the land in a township is owned by actual settlers, the land hunger of the people made them secure farms for their children as well as for themselves. The church and school are consequently at a distance from all but two or three families. Various plans are being tried to overcome this great practical inconvenience, but it is found rather difficult to eat your cake and have it. Notwithstanding the comparative poverty of immigrants and many other obstacles in the way, however, there are already between one and two hundred schools in Manitoba, where there were not a dozen seven years ago. Religious exercises and instruction are prominent features in the Roman Catholic schools. In all others, portions of Holy Scripture are read, and prayers, according to forms in the bylaws and regulations, are offered at the daily opening and closing.

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MANTOYA COLLEGE, WINNIPEG.



Neither High Schools nor Colleges have been established under the School Law. All work of higher education has been done by the Churches. Intermediate education at any rate must soon be publicly cared for in Winnipeg and other large towns, and ample provision can be made for it and probably for Colleges too, out of the magnificent land endowment wisely reserved by the Province, for Educational purposes, at the outset. A few years ago the Board of Education proposed to sell these lands at one dollar an acre. Fortunately their proposals were overruled. The lands are now worth from four to ten dollars an acre. At present, the three Denominational Colleges do High School work, and two—St. Boniface and St. John's—have even Primary departments, but of course such a primitive state of things cannot be permanent.

St. John's College, in connection with which are St. John's College School for Boys and St. John's College Ladies' School, is under the auspices of the Episcopalian denomination. These institutions are situated in the Parish of St. John, one of the modern suburbs of the city. St. John's School was established in 1820 and incorporated as a College in 1871. It was commenced by the Rev. John West, and rose to importance under the management of the Rev. John Macallum, M.A. The College is governed by a council under statutes given by the Bishop and sanctioned by the Synod. The Ladies' School is an institution of later date. A handsome new brick building erected for its use has accommodation for thirty young ladies and also for the matron and assistants required. The College and School are well attended, boys coming to them from the posts on the Mackenzie River, three thousand miles away. The Bishop of Rupert's Land is at the head of these institutions, and is indefatigable in his efforts to promote their welfare.

Manitoba College—in connection with the Presbyterian Church in Canada — was established in 1871, in Kildonan

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and was shortly afterwards removed to more suitable premises in the city of Winnipeg. These were disposed of in 1881, and handsome new buildings erected in the western part of the city between Portage Avenue and Notre Dame Street. The corner stone of the new College was laid by the Governor-General, Lord Lorne, in August last. The structure is of brick, rock stone foundations, and three storeys in height. Four acres and a quarter of land form the College grounds. The cost, including furnishings, will be about \$40,000. The Board of Management consists of the following:—Hon. A. G. B. Bannatyne, Chairman; Prof. Bryce; Prof. Hart; Revs. Thos. McGuire, A. Matheson, James Robertson, Alex. Campbell, Allan Bell; Hon. D. A. Smith; Hon. G. McMicken; H. McMillan, M.P.P.; A. W. Ross, M.P.P.; Messrs. D. McArthur, and John Sutherland. The faculty consists of: Rev. George Bryce, M.A., LL.B., Professor of Science and Literature; Rev. Thomas Hart, M.A., B.D., Professor of Classics and French; Rev. R. Y. Thompson, B.A., Lecturer in Science and Literature; Mr. R. G. MacBeth, University of Manitoba, Lecturer in Classics and French; Mr. R. W. Jameson, B.A., (Cantab.), Lecturer in Higher Mathematics; Mr. A. M. Campbell, University of Manitoba, Lecturer in Ordinary Mathematics. The Senate consists of Rev. D. M. Gordon, B.D.; Professor Hart; Professor Bryce, James Robertson, C. B. Pitblads, and Alex. Campbell. The objects of the College are to give such higher education as the requirements of the country may demand, and to prepare students for the ministry under the supervision of the Presbytery of Manitoba. This College takes a foremost place among the educational institutions of the country.

In 1877, the University of Manitoba was established with its seat at Winnipeg, "for the purpose," as set forth in the preamble to the Act of Incorporation, "of raising the standard of higher education in the Province, and enabling

all denominations and classes to obtain academical degrees." The three denominational Colleges are affiliated to the University, and as the country develops, others will spring into existence and take advantage of its privileges. The University is governed by a Council consisting of a Chancellor and Vice-Chancellor, of representatives for each of the Colleges that may be affiliated, three representatives elected by the Convention of Graduates, and two representatives of the Board of Education. Degrees in Arts, Law, and Medicine are conferred by the University, and power is given to the several Colleges, with the consent of the religious bodies with which they are connected, to establish separate faculties in theology, and grant the Degrees of Bachelor of Divinity and Doctor of Divinity. The Chancellor of the University is the Bishop of Rupert's Land; the Vice-Chancellor, Hon. Joseph Royal, M. P.; Registrar, Thomas Bernier, Esq.; Board of Studies—Chairman, The Bishop of Rupert's Land; Secretary, Prof. Hart, M.A., B.D.

Manitoba has shown that it is possible to organize University education on a basis that does equal justice to denominational and to non-denominational efforts. The harmonious co-operation of the Colleges, and their willingness to make changes in their respective ideals, are signal proofs of the wisdom and catholic spirit of the men who govern them. Thus, St. Boniface College introduced more mathematics and more of physical and natural science into its curriculum than the Archbishop thought desirable, in order to meet the views of the other Colleges. Manitoba College, again, gave more prominence to classics than it might otherwise have done. The tolerant spirit of the council is also shown by its allowing separate papers on logic, natural and moral philosophy, and history to be set for the students of St. Boniface who come up to the University examinations. Educational problems considered insoluble in other countries and provinces have thus been quickly solved in Manitoba. The evil spirit of

sectarianism has been exorcised, not by the ostrich like wisdom of ignoring sects, but by frankly acknowledging the good work they have done, and securing their co-operation in common objects. Justice is done to all, and in consequence, Colleges with different histories, ideals and modes of government gladly send their alumni to one centre to be stamped with the common stamp of the University of Manitoba. May the spirit that has presided over the University in the days of its poverty not desert its authorities when through the development of the country it becomes wealthy and powerful!

Roman Catholic Missions of St. Boniface, Manitoba.

[THIS ARTICLE WAS WRITTEN BY ARCHBISHOP TACHE'S SECRETARY.]

It has been the scene of heroic efforts for general good which have brought about the most distinguished feature of the locality, that of its religious, educational, and benevolent Institutions.

Lord Selkirk, anxious to attract to his colony the French Canadians dispersed throughout the country, took the necessary steps to secure the services of two priests. Bishop Plessis, the then Bishop of Quebec, willingly acceded to the request and proposed the important mission to the Reverend J. N. Provencher, and the Reverend S. Dumoulin, who generously accepted it. The Reverend gentlemen travelled in birch canoes and reached Point Douglas, now Winnipeg, on the 16th of July, 1818. Shortly after they crossed the Red River and began the settlement to which they gave the name of St. Boniface, the Apostle of Germany, as a mark of regard for the Catholic German soldiers who had accompanied Lord Selkirk and who were located in the neighborhood.

The Reverend Mr. Dumoulin went to Pembina where there was at the time a large settlement of French Canadians and Half-breeds.

The Reverend Mr. Provencher was consecrated Bishop on the 12th of May, 1822, and remained in St. Boniface until his death which occurred on the 7th of June, 1853. Consequently he had been thirty-seven years at the head of the diocese of St. Boniface. He sent missionaries to the Saskatchewan country, to Athabasca, to British Columbia and Oregon. The establishment of St. Boniface may be justly considered as the head-quarters of the immense field which extends to the Pacific and Arctic Oceans.

The first Church in the country was erected by Bishop Provencher, shortly after his arrival, in 1818. It was a modest wooden building and served at the same time as a dwelling and school-house. Five years later the prelate raised a more spacious construction, and in 1832 laid the foundation stone of the handsome cathedral which was destroyed by fire in 1860.

After having toiled during twenty-six years with a very limited clergy, Bishop Provencher succeeded in securing for his diocese the services of the Oblate Fathers. The Reverend Father Aubert, the first Oblate missionary of Red River, arrived at St. Boniface on the 25th of August, 1845, in company with a novice of the same order, then in his 22nd year, consequently under age to be promoted to the priesthood. This novice was, by the leadings of Providence, to become the immediate successor of the first Bishop of St. Boniface. In October, 1845, the Reverend Father Taché was ordained priest and appointed to the remote mission of Isle à la Crosse. The zeal and ability of the young missionary could not fail to be noticed and the fast declining health of Bishop Provencher rendering it necessary to obtain a co-adjutor, the choice fell on the Reverend Father Taché, then only twenty-six years of age. The elect received the episcopal consecration in the Cathedral of Viviers (France) on the 23rd of November, 1851. The new and exalted dignity only served to invigorate the ardor of the missionary-bishop for the salvation of souls. He speedily returned to his mission of Isle à la Crosse. They only, who have witnessed or experienced the like, can form an idea of the fatigue and sufferings he endured while travelling, especially during the long and severe winters of the far north. Equally difficult would it be to enumerate the privations endured in every shape.

After the death of Bishop Provencher, Bishop Taché succeeded to the see of St. Boniface. The diocese then compre-

hended an immense extent of territory. It has been divided since, and in 1871 Bishop Taché was named Archbishop of a new ecclesiastical province, which includes the Archdiocese of St. Boniface, the diocese of St. Albert, the districts of Athabasca and Mackenzie and British Columbia.

Archbishop Taché has been in the country thirty-seven years. Fire, floods, and famine have, in turn, spread destruction and desolation, but at the same time served to give striking proof of the energy and self denial of the father of his flock and the friend of all.

As already stated the Cathedral of St. Boniface was consumed by fire in 1860. Bishop Taché had it replaced by a stone edifice of fine design to be entirely completed this year. It possesses a splendid organ, the gift of the numerous friends of the Archbishop in the province of Quebec, on the occasion of the twenty-fifth anniversary of his election to the episcopate in 1875.

East St. Boniface.

What Brooklyn is to New York, Birkenhead to Liverpool, and Oakland to San Francisco, East St. Boniface will be to Winnipeg. Already a large number of fine private residences and manufactories as well as business premises, the property of citizens belonging to Winnipeg, have been erected. The ground on which the rising city is to be built is high, dry and particularly inviting for suburban residences. A fine iron bridge has been constructed across the Red River, connecting Broadway in Winnipeg, and Provencher Avenue, in St. Boniface, in which it is expected tramways will be in operation in a few months. St. Boniface, undoubtedly was one of the most interesting settlements of Lord Selkirk in the Red River country.

The Archbishop's residence, which replaces that burnt with the Cathedral in 1860, is a nice dwelling-house built of stone, having in front walks planted with trees.

It is not only the abode of the Archbishop and his clergy, but the hospitalities of the dwelling are also gladly proffered to missionaries worn out by hardships and toil.

Residents: His Grace the Most Reverend A. Taché, Archbishop of St. Boniface; Rev. Father J. Tissot, O. M. I., Vicar-General; Rev. Father A. Maisonneuve, O. M. I.; Rev. G. Dugast; Rev. Father J. McCarthy, O. M. I., Secretary.

SCHOOLS OF ST. BONIFACE.

From the beginning of the establishment of St. Boniface peculiar advantages have been afforded for the instruction and education of youth.

THE COLLEGE.

A portion of his residence was reserved by Bishop Provencher on his arrival in the country to begin the first college of St. Boniface, and the devoted prelate all his life time, added the teaching of children to his other numerous and important occupations. To his successor, Bishop Taché, it was reserved to build the College still to be seen on the banks of the Red River, and, within the two last years, the magnificent edifice just completed, for the same purpose. While the location, the construction, the playgrounds, and everything connected with the new college are conducive to health and comfort, nothing is spared, on the other hand, to promote the mental advancement of the pupils.

The course of studies is all that is necessary to fit a young man for commercial and scientific pursuits. It also includes all the branches of science required by the University programme for taking degrees, thus preparing the student for the study of the liberal professions.

Members of the Corporation: His Grace the Most Reverend A. Taché, Archbishop of St. Boniface; Rev. A. A. Cherrier, B. S., Principal of the College; Rev. G. Dugast;

Rev. J. T. Lavoie, O. M. I., and Rev. J. McCarthy, O. M. I.; Staff: Rev. A. A. Cherrier, B. S., Professor of Divinity and General Superintendent of Studies; Rev. G. Cloutier, Professor of Mental and Moral Philosophy and High Mathematics; Rev. S. Moreau, Professor of Natural Science and French Literature; Rev. T. Quevillon and Rev. J. Dufresne, Professors of Classics and Modern Languages; Messrs. Meloche and Morin, Professors of English Literature and English Commercial Course. Assistant teachers: Messrs. Rev. T. L. René, J. Messier, J. O. Barrett, and A. Berubé; Prefect of Discipline; Rev. N. Jutras. The musical department is under the direction of the celebrated violinist, Mr. F. Boucher; Rev. J. Doucet is Bursar and Steward. His Grace Archbishop Taché, in addition to building the College, has founded several scholarships in favor of promising students. His Excellency the Governor General of Canada yearly grants a medal of honor to the most successful student in Greek.

The collegiate year embraces two terms. The first beginning in August and the second in February.

CONVENT OF ST. BONIFACE.

Sisters Valade, Lagrave, Coutlee, and Lafrance, members of the Grey Nunnery of Montreal came, at the call of the first Bishop of St. Boniface, in 1844, to found a branch of their Order in St. Boniface. The Convent generally known as the General Hospital of St. Boniface is the mother house of the establishments of Sisters in St. François Xavier, St. Vital, and St. Norbert. The Superior has also jurisdiction over the Convents of St. Albert, Lac la Biche, Isle à la Crosse, and MacKenzie River. There are at present in the province of Manitoba 37 professed Sisters and 6 novices. Principal officers: Sister Hamel, Superior; Sister Lany, Assistant and Mistress of Novices; Sister Curran, Secretary; and Sister St. Placide, Bursar.

ST. BONIFACE ACADEMY.

The chief object Bishop Provencher had in view when inviting Sisters to his diocese was to afford means of instruction to youth. Upon their arrival, in 1844, the Sisters opened their school, which has been largely attended ever since, crowning their efforts with complete success. Besides upwards of 40 boarding pupils there is an average attendance of over 100 day scholars. The course of studies is made in English and French, vocal and instrumental music, drawing, and plain and fancy needlework are also taught. In a word, everything that tends to form accomplished young ladies is attended to. Sister Royal, Directress; Teachers: Sisters Dunn, McDougall, Desnoyers, Bourassa, Brouillet, and Trudeau.

CHARITABLE INSTITUTIONS.

Although the Sisters of Charity were called upon chiefly for the instruction of youth, they have constantly exercised corporal works of mercy,—taking care of the aged, infirm and orphans, visiting and attending the sick.

The Hospital.—The Sisters of St. Boniface have their hospital for curable patients, and its eleven beds are almost constantly occupied by sick, irrespective of creed or nationalities. Sister Cleary, Directress; Sister St. Ann and other members of the Sisterhood assist when required.

The Orphanage.—From 35 to 40 little girls of various nations and tribes are the object of the most tender solicitude of the Sisters in this ward. All the children of school age attend the classes regularly. Sister Boire and Sister Derome.

The Refuge.—Seven infirm and helpless females are here under the care of Sister Cusson.

Visitation of the Poor and Sick.—Many families are benefitted by the ministrations of the Sisters of Charity.

CHAPTER XXIX.

Indians of the Prairie and the Forest.

The Intention of the Chapter—Extinction of Indian Titles—Enumeration of Different Indian Treaties—Location of the Lands Ceded—General Terms of the Various Treaties—Indian Characteristics—Former Habits—Horse Stealing no Crime—Considered a Virtue and still Indulged in—How Conducted around the Cypress Hills in 1880—How I Saved my Horses—The Union Jack Versus the Stars and Stripes—Settlers need have no Fear—Indians and their Occupations on Lakes Manitoba and Winnipegosis—Food, Game, and Furs—Potatoes and Garden Vegetables—Indian Reserve at Fort Pelly—Cote's Medal—Reasons for Marrying more than one Wife—Minnesota Sioux—Generally Hard Working and Peaceable—Plain Crees—Their Feuds with the Blackfeet—Extract from Palliser—Peace made Ten Years Ago—Big Bear—His Desire for Better Terms—The Wood Crees—Quiet and Industrious—The Chipweyans as Farmers—Food of the Indian Tribes—The Assinibolnes—Anecdotes Regarding their Peculiarities—Conclusion.

It is not my purpose to write an exhaustive treatise on the Plain and Forest Indians, but merely to enumerate the principal tribes, define as nearly as possible their present locations, and relate a few anecdotes that may be interesting and suggestive to my readers. At present it can scarcely be said that any one tribe is still on its old hunting grounds, and hence to arbitrarily define limits would require more space than I have for the subject.

When the Canadian Government obtained possession of the North-West Territories by the extinction of the Hudson's Bay Company's title, they inaugurated their authority by a solemn declaration that the rights of all should be respected. As an earnest of this a large tract of land in Manitoba was set apart for the Half-breeds and their children. In 1870 the Indians of Manitoba, seeing a great influx of white men into their country, asked that a treaty should be made with them guaranteeing certain privileges. The following enumeration of the Treaties will show the successive steps taken by the Government to extinguish the Indian titles to the North-West lands:—

Treaty No. 1 was made at the Stone Fort on the 3rd August, 1871, between the Canadian Commissioner Wemyss M. Simpson, Esq., of the one part and the Chippewa and Swampy Cree Indians on the other. This treaty included the Province of Manitoba and extended from the Lake of the Woods on the east to the Assiniboine Rapids, near Brandon, on the west, and from the International Boundary on the south to a line drawn due west from the mouth of the Winnipeg River on the north.

Treaty No. 2 was concluded the same year, August 21st, 1871, at Manitoba House on Lake Manitoba, by the Canadian Commissioner Wemyss M. Simpson, Esq., of the one part and the Chippewa tribe of Indians of the other part. The tract ceded at this time lay partly north and west of Treaty No. 1. It commenced at the mouth of Winnipeg River and passed north to Beren's River, thence west across Lake Winnipeg to the mouth of the Little Saskatchewan, thence up this stream, Lake Manitoba, Water Hen River and Lake, thence west across Lake Winnipegosis to the sources of Shell River, thence down this stream and the Assiniboine to Fort Ellice, and thence southwesterly to Moose Mountain, and thence southwards to the International Boundary. This tract included a large area, not being much less than 40,000 square miles.

The North-West Angle Treaty, or Treaty No. 3, was concluded October 3rd, 1873, and extinguished the Indian title to all lands lying between Lake Superior and the eastern limit of Treaty No. 1. This treaty was made by the *Saulteaux* branch of the Chippewa nation and tied the hands of a turbulent and exacting people. The number of square miles included in this treaty were 55,000.

Treaty No. 4, or the *Qu' Appelle* Treaty, was concluded after a great deal of difficulty on the 15th September, 1874. By this treaty the Cree, *Saulteaux* and other Indians ceded a large tract of valuable territory, and the basis for treaties

with the other plain Indians was laid down. The eastern boundary of the district ceded, coincided with that of Treaty No. 2. Its northern boundary passed through the middle of Lake Winnipegosis to the mouth of Red Deer River, thence up this river to the source of its western branch. From this point, it extended in a southerly direction to the western extremity of the Cypress Hills, including all the land drained by the northerly branch of the Qu'Appelle. The remainder of the western boundary extended due south from the Cypress Hills to the International Boundary, which formed the southern one.

This led the way for another treaty the succeeding year, which was concluded at Beren's River and Norway House, in the month of September, 1875. A very large extent of territory lying east, north, and west of Lake Winnipeg, was ceded at this time, and not less than 100,000 square miles were added to the treaty limits. This last treaty included the mouth of the Saskatchewan, and extended westwards as far as No. 4 Treaty.

The Treaties of Fort Pitt and Carlton are called Treaty No. IV, and were concluded in the Autumn of 1876. By these treaties the Plain and the Wood Cree Indians, and all other Indians inhabiting the territory, resigned their claims to the lands. Within the limits of this treaty are included all the lands within the following limits, that is to say :—

“Commencing at the mouth of the river emptying into the northwest angle of Cumberland Lake, thence westerly up the said river to the source, thence on a straight line in a westerly direction to the head of Green Lake, thence northwards to the elbow in the Beaver River, thence down the said river northerly to a point twenty miles from the said elbow ; thence in a westerly direction, keeping on a line generally parallel with the said Beaver River (above the elbow), and about twenty miles distance therefrom, to

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"And also all their rights, and privileges whatsoever, to all other lands, wherever situated, in the North-West Territories, or in any other Province or portion of Her Majesty's Dominions, situated and being within the Dominion of Canada;

"The tract comprised within the lines above described, embracing 121,000 square miles, be the same more or less;

"To have and to hold the same to Her Majesty the Queen and her successors for ever."

The text of Treaty No. VII is given in the succeeding chapter, and may be taken as a fair example of the text of each.

The habits and mode of life of the various Indian tribes vary with their locations and the character of the animals on which they subsist. The Chippewas which inhabit the shores of Lake Superior, and frequent the lakes and rivers lying between it and Lake Winnipeg, differ in no particular in their mode of life from the Swampy and Chipweyan

Indians found in the forest country stretching from Lake Winnipeg to Portage la Loche. The chief article of diet for all these Indians is fish, and their mode of cooking is the same everywhere. During the summer they are found encamped in small parties at the discharges of lakes or on the shores of small bays where there are sandy or gravelly shallows or at the foot of rapids or rivers. Here they set their nets and draw from the water day by day their necessary food. Excursions are frequently made for the purpose of hunting, but their chief dependence is on fish. Cooking amongst the Indian tribes is a very simple process, yet they can roast a duck or other fowl to suit the taste of any gourmand. Should a little flour be obtained at a fishing station, a number of fish are cut up and put in a pot with water and a handful of flour, and boiled for a short time. The pot is then taken off and all gather round, and the contents are eaten with great gusto, and they drink the liquid with evident relish. Seeing a family eating in this way after you have had a hearty meal is certainly disgusting, but should you be hungry you are altogether oblivious to the mode, as you see only the food. In 1869 I saw the Indians at the Pic on the northeast coast of Lake Superior eat fish as I have described and considered their habits filthy in the extreme, yet in 1875, when starving at Buffalo Lake, I considered boiled fish and fish broth without flour a rich treat, and could see nothing wrong except in its scarcity.

Very little dried fish seems to be eaten by the eastern Indians, but those west of the Rocky Mountains dry enormous quantities for winter use. As these fish are dried without salt, and eaten without being cooked, I may say that dried fish "straight" was the most unpalatable food I ever ate. An old Frenchman at Fort St. James on Stewart's Lake told me he had lived on dried fish for nearly forty years, and showed how his teeth were worn chewing them. His son and an Indian boy when travelling with us caught

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fish for a few days, every evening and morning, for their breakfast and supper, but when they found that these meals came independently of the fish they ceased to catch them.

Indians know very little of being prepared for a scarcity, and they are therefore either in a state of affluence or in want. Their work consists in procuring food, and if they can beg it from a white man or get it from a relative, they will lie around all day and make no effort to help themselves. In one sense Indians are not lazy as they will travel immense distances for very little, but in these cases a proper incentive was held out to them. As soon as Indians can be awakened to a sense of individual rights in property, and that lazy relatives must depend upon themselves, an improvement will take place. At present food seems to be common property, and as long as it remains such little attempt will be made by the majority to get out of their periodic states of semi-starvation. Their apparent laziness springs from precisely the same cause as that of a child whose wants are all supplied by the parent. Cut off the supply and nature asserts her wants and necessity causes action. Indians, if incorporated with the whites as Negroes have been, would work just as well, but being isolated and partly supported by the Government, they seldom rise above the level of dependents. A change of policy will cause a change in their character, and when missionaries learn to teach the young people to speak, and therefore think, in English, much of the work will be performed. The present system only perpetuates their misery, and the christianized Indian who cannot speak English is apparently—if not lower—as low in the scale as his pagan neighbors. Indians can be raised in the social scale by teaching them English, but I question very much the benefits arising from mere preaching, without the civilizing influence of our language and literature. There is no reason why an Indian child should not read the same stories, see the same pictures,

have the same teaching, and, therefore, think the same thoughts, as our own children. As a rule, Indian children are more intelligent looking than those of the lower class of Whites, and certainly they show a greater aptitude to learn, but they get no chance, and hence, they remain as their fathers were, or worse. The Indian language must be dropped, and nothing spoken but English, and as a result, in two years the Indian question would be settled. Throughout the North-West, wherever I found an Indian could talk English, I found one who wore white man's clothing, and who tried to attach himself to the Whites. Should the Government compel every Indian child, under sixteen, to attend the schools, either established on the Reserves or about to be established, the Indian question would settle itself in the course of the next ten years; but should their education not be compulsory, very little change will be effected, as Indian nature resembles human nature the world over. Missionary enterprise must take a more practical shape than it has hitherto done, before much permanent good will be effected. I speak from a knowledge of Missionary work from the Pacific to the Sault Ste. Marie, and I write advisedly when I say that only earnest, wise, and practically good men should be sent into the Mission field. Good men are very well in their place, but *more* than goodness is wanted in a western Missionary.

Indians have been accused of having loose morals, as regards the marriage relation, of being liars, of being thieves, of being malicious cut-throats, of being lazy, and of being drunkards. Before answering this question, I would say that the majority of the Whites, having dealings with the Indians in past years, were of this type. At present, when an Indian is worse than his fellows, at whose door is the fault laid? Certainly not at that of the untutored savage, but of the evil-minded white man who led him astray for his own selfish ends.

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Marriage amongst the Indians has never been looked upon by them in the same light as it has been by us. All Indian women are slaves, and they know it and act accordingly. The will of the man is supreme, and no woman ever thinks of opposing him in the slightest. Men, as a rule, take as many wives as they can feed, and too often, when they are tired of them, "throw them off." This is the universal custom, and is practised from Lake Superior to the Pacific. The husband hunts, and the women do all the other work. Very often, one wife will be the favorite, and the others will have to provide for themselves and children. Last season, I saw one man who had five wives and a very large number of children, and who, on this account, was a rich man, as the Government paid him five dollars (\$5) a head for his wives and children. The woman is little less than a beast of burden, and amongst converted Indians, her condition is very little improved. As regards the chastity of the Indian women, much could be said in their favor. They, as well as the men, are modest, and if their morals are not as elevated as ours, the fault is not theirs, but the state of society in which they are compelled by present circumstances to live.

In all my travels, I never found an uncivilized Indian who could not be depended upon, but I have seen Indians, who were deceived by white men, try to follow their example. The northern Indians still retain their truthfulness, and Mr. Macfarlane, the Chief Factor in charge of the Mackenzie River District, warned me to keep my promises to the Indians, and I might depend on them doing the same to me. The Hudson's Bay Company's officers have always been particular in keeping faith with the Indians, and to-day the Indians look up to them and trust them in everything. It is a fact that no men are more particular about paying their debts than the Indians, and those having dealings with them, before they learn the ways of the Whites,

are unanimous in speaking of their promptness in paying their debts.

I have travelled among the Indians on both sides of the mountains, and have found them *always* honest. I have gone into the Blackfeet camp, when they were dying of starvation, and left my provisions in the carts, exposed to the gaze of every person, and yet not a bit of anything was touched. I have been for months on the prairie with my provisions always in the carts, and although at times surrounded by prowling bands of Indians, I have gone to rest in peace and have risen to find signs of their presence, but not an article touched. If an article were lost on the prairie, it was almost sure to be returned in a day or two, and a small present of tea would be accepted as ample remuneration for their trouble.

Some parties reading the above paragraph will say that their experience is altogether different from mine. I do not doubt it, as Indians invariably treat others as they have been treated. I went into their country as an employee of the Government, and always carried a small Union Jack on a pole on one of my carts, and although they did not recognize me, they knew the flag and respected the emblem. Traders take advantage of the natives, and no Indian should be blamed if he should treat them all as he does the Americans. Ten years since, no white man, passing from Montana into our North-West Territories, was safe; but if he were travelling south, both himself and his horses were respected. Just as long as our people treat the Indians like men, and keep faith with them, just so long will peace reign in the land; but let justice cease to prevail, and bitterly will our people rue the day they forgot that in God's sight the Indian has equal rights with the white man.

Formerly horse stealing was looked upon by the plain Indians as an essential part of their education. No young

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man was considered fit to take part in any matter which came before the tribe, who could not show a brilliant record in this line. War parties and horse stealing parties were altogether different, and any traveller could tell the one from the other at a glance. When a war party is organized the braves are mounted on their best horses, they are daubed all over with paint and depart with much ceremony. It is not so with horse stealers. One or two or more start off on foot, often without arms, furnished only with a *lariat* wound round their loins. These men thus poorly equipped will push into the heart of the enemies' country, lie around a camp and take the horses tied at a lodge door from under the very eyes of the guard.

While exploring in the summer of 1880 I came to a camp of Assiniboin on the western end of the Cypress Hills. The camp consisted of about 120 tents arranged in a circle. Each chief had his own band near himself, but no opening was over ten feet wide. Within the circle of tents the horses were picketed every night, and during the day every hill top had one or more sentries posted on them to watch the herds and give notice of the approach of danger. One night two Pagans who had been lying around for days approached the camp, and one stripping himself naked crawled into the midst of the enclosure and cut the picket rope of two of the horses. All around him were the tents of his enemies, and in the centre the soldiers tent (guard house) where they were on watch. After cutting the ropes he moved off to one side until the ropes tightened when he pulled gently. The horses came towards him eating as they came, and by degrees he brought them to the edge of the enclosure, when bounding on the back of one and leading the other he dashed away. This feat was performed by an unarmed Indian before the very eyes of his deadly enemies, armed with Winchester rifles, not merely for the sake of the horses, but that he might be considered an honorable man in his tribe.

I for one honor him for his pluck, and consider such heroism just as worthy of being recorded as any of the doughty deeds of our ancestors.

Two weeks before I reached Fort Walsh the Pagans (as was supposed) stole every horse in the valley belonging to traders, but took none that belonged to the police. I was advised to place a guard over my horses at night or I would be left without any, but believing that I understood the Indian character better than my informants, I merely indicated by the Union Jack that I was no trader and my horses remained unmolested. More than once we have observed traces of Indians having been around us in the night, but none ever attempted to take anything from us. One day in the month of September, 1880, we were suddenly surrounded by Indians. Simultaneously every hill top was instinct with life, and an Indian and his horse were picketed on the summit. Without paying any attention to them we kept on our way and stopped for dinner shortly after. I took a shot gun and started for the nearest one, who when he saw me approach mounted his horse and came towards me. When he came up I saw by his dress he was one of Sitting Bull's Sioux and invited him to dinner. As soon as we met the others disappeared and were seen no more. Three days before this same party stole nearly all the horses from Setter's Reserve at the north side of the Cypress Hills. No attempt was made to molest us because they respected our flag.

Settlers need have no fear on account of injury from Indians. They respect the law everywhere better than the white men, and good treatment will always be reciprocated. Should the American doctrine be adopted that all Indians are mere cumberers of the ground, and have no rights that a white man is bound to respect, then will there be danger from the aborigines.

Food and clothing are the necessities of the Indians.

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Supply them with these and they will pass through life with scarcely an effort. For many generations they have lived and died without any higher aim than the physical promptings of nature. To eat, smoke, and sleep has been their sole end in life, and this it will be until, as I have shown in another place, they are lifted into our civilization. An Indian clothed as a white man is half civilized, and when he acquires a good command of English he is ready for work.

The Indians on Lakes Manitoba and Winnipegosis may be taken as a fair sample of the forest Indians all through the north. As soon as spring comes and the rivers and lakes are open, innumerable water fowl fill every pond and lakelet. The Indian leaves the forest and pitches his tent near one of these resorts, and a time of feasting sets in which lasts up to the end of May. During June and the latter half of May the marshes yield myriads of eggs, and these with white fish are their principal, if not their sole food. The summer is spent near a good fishing ground. A sufficiency of nets is kept in the water to enable them to have a constant supply of fresh fish of the very best quality. Should a family make an excursion to any part of the lake a net, a tin pail or two, and a few rolls of birch bark, complete their equipment.

On the approach of winter, they go to the regular fishing grounds, and take white-fish in such numbers that, were any one to give figures, it would seem fabulous. These are dried and packed for winter use, and when the ponds are frozen, each family retires to its winter hunting ground, and procures furs for the purpose of paying off their score with the Hudson's Bay Company. In spring, the same round commences again, and thus it has gone on for generations. The cultivation of potatoes has been introduced of late years, but the usual improvidence of Indians causes them, in too many instances, to eat up their seed, so that every spring, a fresh supply has to be sent to them by the Government.

Of late years, many Indian farms have been established, and these are teaching the natives much more than many cursory observers would believe. Living for a great part of the year in the neighborhood of the farm, they soon learn the white man's mode of doing things, and begin to imitate him. Coté's Reserve, near Fort Pelly, is an instance in point. About three miles from the Indian farm is Coté's residence, and here he carries on farming in the most approved style. I visited his farm last autumn, and found an excellent root-house in which to store his potatoes, turnips, carrots, and other roots. His potatoes were well hoed, his peas roded, his carrots and turnips in drills, and properly thinned, and all he had done was after the most approved fashion. With evident pride he showed me over his possessions, and chuckled in proper Indian style when I praised what he had done.

When the Governor General was on his North-West tour last year, he called together a large number of Indians, and gave a beautiful silver medal to the best farmer amongst them. Coté received the medal, and now he shows it to his visitors with as much pride as any white man. Where there is pride there is hope, and were the Indians on the Reserves given a slight recognition for successful farming each year, a wonderful improvement would be seen in a short time.

At present, marriages are more frequent than formerly, and not a few Indians take more than one wife. One old fellow, on Lake Winnipegosis, had six wives, and when questioned about it, admitted that they were a source of profit. According to the terms of the Indian Treaties, all members of an Indian's family are entitled to five dollars per year each, and one with four or five wives and twenty children or less, would draw a large sum from the Government. Taking advantage of an Indian's natural desire for gain, much might be done by opening up sources of profit to

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him, which, in no way, would conflict with the white laborer. No better herdsmen could be found, as their powers of observation are far superior to those of a white-man and their wants are extremely few. As farm laborers, however, the present generation are, with few exceptions, useless.

After the Minnesota massacre, in 1862, a large number of Sioux came across the border, and since then have remained on our side of the line. Many of these are now settled on a Reserve, southeast of Fort Ellice, on the left bank of the Assiniboine. They are generally industrious, and are gradually becoming farmers. On our side of the line, their character is completely changed, and they are civil, peaceable citizens.

The Crees are divided by their place of abode into the Plain and Wood Crees. Those who inhabit the plain live chiefly on the buffalo, and disdain the use of a shot gun, while their brothers in the north, having few horses, little large game, and plenty of ducks and fish, prefer it to the rifle. The Blackfeet were the hereditary enemies of the Crees, and many a battle ground is pointed out where these tribes met and killed each other. In former years, when reading of Indian fights, I could not understand why all the massacres took place in daylight. The cause arises out of a superstition amongst the Indians, that any person killed in the dark, does not pass to the happy hunting grounds. It was not their enemies they cared for, but their fear was for themselves. Battle River, the Eagle Hills, the Hand Hills, and many other localities are noted for their massacres in the past. Numerous instances of heroism and undaunted courage are related by the Half-breeds, as they sit around the camp-fire in one of those places, and one almost thinks he hears the stealthy tread of the savage, as he listens to the soul harrowing recital. Palliser relates a characteristic anecdote of the nature of Indian

fight, on page 53 of his Report, which illustrates more than one point of Indian character :—

“The Doctor had slept in an adjacent Indian camp on the Coteau, in one of the tents of which was suspended an Indian scalp, and amongst other women the wife of the unfortunate Blackfoot, who had been murdered, was obliged to dance round her husband’s scalp. The whole of this forenoon was occupied in crossing over a succession of ridges or prairie rolls, among which are a number of lakes. We then met another Indian, who informed us that he was in pursuit of his wife, with whom a young man had run away a few days previously. There was also among the party who had accompanied the Doctor an Indian who had been scalped not very long before, when in an encounter with the Blackfeet he lay wounded, and when insensible from loss of blood and left for dead; but after his enemies had departed and his consciousness returned, he made his way back to his friends. He wore a handkerchief bound tightly round his head, and did not wish to show it to the Doctor, nor did he like that his misfortune should ever be talked of. Nichiwa told us that he was one of four young men who had escaped from a massacre of his friends by the Blackfeet in a ravine near the elbow of the south branch of the Saskatchewan last spring. It appears that the Crees and Blackfeet had been at peace, and were tenting together, but after the return of the former twenty-five young Crees formed a horse-stealing party, and having previously constructed rafts, succeeded in stealing the Blackfoot horses, and by crossing themselves on the rafts succeeded in leading off the horses, swimming in their wake. When the Blackfeet missed their horses they set off in pursuit, and following up the track came to the bank of the river whence they had been taken across. While they were still there one of the young Crees actually had the hardihood to reveal their position by glancing a small looking-glass, and as it were chaffing the Blackfeet. The season being so

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early (just after the breaking up of the ice), the water was intensely cold and the river very high, wide, and rapid, so that these young Crees never dreamt of the possibility of the Blackfeet pursuing them without rafts across the South Saskatchewan, and during the time consumed by the Blackfeet in the construction of these they thought they had abundance of time to escape with their stolen horses far beyond the fear of pursuit. The Blackfeet, however, turned about and departed as if returning to their camp, and then made a detour to a point higher up the river where, concealed by a bend, they swam their horses across. At sunset they fell upon the young Crees, surrounded them in the couléé in which the men encamped, and killed seventeen of them on the spot with bows and arrows, and by rolling large stones on them. A few got away wounded under cover of the night, and only three or four ultimately recovered. Several old Indians were still in mourning; these were related to some of the young men whose fate I have recorded. An old man who had thrown away almost the whole of his attire, and was now only clad with a very old robe, and with his head plastered with mud, implored me not to go farther among "these wicked men." They also alarmed my men considerably with various tales, more or less true, concerning the prowess of the Blackfeet."

In 1871 a permanent peace was entered into between the Crees and the Blackfeet, which, with the exception of a little horse stealing, has been kept ever since. No man without being fully acquainted with the country and people can at all estimate the value of the police during the past eight years. Indians and Whites estimate them at their real value, and although many of the latter in the South-west complain of them being one-sided in their dealings with them and the Indians, they frankly admit that the police are men of peace.

One Cree chief—Big Bear—refused "to take the treaty," and in the fall of 1878 caused some trouble by gathering to

himself a band of discontented Indians and roaming over the buffalo plains to the south of Battleford. Buffaloes disappeared in 1879, and he threatened that he and his band were going to live on the whites, and that he would not starve as long as things were to be had in the country. As food became scarcer his men left him and joined other bands. Last year he accepted the treaty, and now every Indian from Manitoba to the Rocky Mountains admits he is amenable to the laws, and governs himself accordingly. At present there is no more danger in travelling over the Indian country than there is in passing through any part of Ontario. Big Bear like many others thought a little bluster would enable him to make better terms, but the disappearance of the buffalo left him without resource, and like many a hero of old he succumbed to starvation.

The Wood Crees living chiefly north of the Saskatchewan are quiet and as a rule industrious. Except occasional trips to the south in pursuit of buffalo they generally live in the forest and subsist on fish, fowl, and the smaller game. For many years they have cultivated the ground in the neighborhood of the various missions, and raised potatoes and a little barley. Still farther north, in the valley of the Churchill or English River, the Chipweyans are found. This people occupy the country along the lower Athabasca and to the eastward of that river. They generally dwell in houses, and seem to raise potatoes in every part of their territory. Their chief food is White-fish, but they are excellent hunters and seldom know what it is to be in want.

While travelling in the country north of Isle la Crosse Lake in 1875, I reached Chipweyan House, at the "Narrows" that connect Buffalo Lake with Clearwater Lake. That same evening I made the following entry in my journal:—

Chipweyan House is situated at the eastern end of the "Narrows" and at the head of Clearwater Lake. Here the Chipweyans have built themselves a number of houses.

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The evening we arrived one old fellow named Edward Bigbelly was busy making a table, and appeared quite expert with plane and chisel. The Indians here live entirely on fish and potatoes. I examined two large patches of potatoes which showed the greatest growth of stalks I had seen in the country. They had been badly nipped by frost on the night of the 8th, but were still growing.

Our supper to-night was somewhat peculiar. I sat at a table and ate fish and potatoes with a knife and fork. The men sat on the floor and ate them with their fingers. Old Edward Bigbelly and his wife sat in a corner eating pemmican, while all around on the floor were Indians smoking and staring at the eaters. The Chipweyan women look more like men than their husbands. They are very coarse and masculine looking, while the men are the very opposite. Of course the former do all the work, while the latter only hunt, eat, and smoke.

The Chipweyans are the only Indians, east of the mountains, who build houses and have fixed abodes. They seem to appreciate the comforts of civilization, and probably it would not be difficult to induce them to settle on the land, and support themselves by agriculture.

All the plain Indians have, up to the present time, subsisted entirely on the buffalo, and disdained the use of a shot gun.

These are the tribes which are now dependent on the Government for subsistence. The Mountain Stonies live partly on the buffalo, but principally on the Mountain Sheep and Goat. Wapati and Moose are occasionally obtained, but these are very scarce at present. It has already been mentioned that the Chipweyans and Wood Crees subsist chiefly on birds, fish, and the smaller species of game. The Peace River Indians — Beavers — hunt the moose and bear, and live on their flesh during the summer. In winter, they trap many fine beaver, and during this

season eat little else other than their flesh. Still farther to the north, we find the tribes, between Lake Athabasca and the Arctic Circle, subsisting almost entirely on Caribou flesh. This animal, in its spring and autumn migrations, passes in countless thousands over certain districts of country. At these times, the Indians congregate in the vicinity and slaughter them in thousands. Should the fall hunt be a failure, the fisheries must supply the deficiency, and not unfrequently famine and actual death from starvation result.

Sir John Richardson, speaking of the Esquimaux, gives an excellent picture of their mode of life, and shows plainly why they lay up a store of provisions for the winter, and why the 'Tinnè (Chipweyans) do not. I reproduce the description, as a fitting conclusion to the chapter :—

“Year after year sees these people occupied in a uniform circle of pursuits. When the rivers open in spring, they resort to rapids and falls, to spear the various kinds of fish that ascend the streams at that period to spawn. At the same date, or a little earlier, in more southern localities, they hunt the rein-deer, which drop their young on the coasts and islands while the snow is only partially melted.

“Vast multitudes of swans, geese, and ducks, resorting to the same quarters to breed, aid in supplying the Esquimaux with food, during their short but busy summer of two months. In the beginning of September, the rein-deer assemble in large bands and commence their march southwards, and then the Esquimaux reap a rich harvest by way-laying them at established passes on the rivers or narrow places of a lake. On parts of the coast frequented by whales, the month of August is devoted to the exciting pursuit of these animals, a successful chase ensuring a comfortable winter to a whole community. Throughout the summer, the families, associated by twos and threes, live in tents of skins, and generally enjoy abundance of food, while

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they carefully lay up what they cannot consume for after use. In this respect, they are more provident than the Hare Indians, or Dog-Ribs, who seldom trouble themselves with storing up provisions. This difference of the habits of the two nations, which greatly influences their general characters, has perhaps originated in the different circumstances in which they are placed. The Esquimaux, wintering on the coast, are in darkness at mid-winter; the reindeer and musk-oxen have then retreated into the 'Tinnè lands, and fish cannot at that season be procured in their waters; life, therefore, can only be maintained in an Esquimaux winter by stores provided in summer.

"In the country of the 'Tinnè, on the contrary, the winter fishery is productive, and animals are by no means scarce at that season, but they require to be followed in their movements by the hunter and his family often to a great distance. In such a case, any surplus of food that has been procured must be placed *en cache*, as the term is, where it is exposed to the depredations of *wolverines*, or the still more irresistible attacks of their hungry fellow-countrymen, who are wont to track up a successful hunter, in order to profit by his labors. The 'Tinnè, therefore, have practically decided that it is better for them to live profusely while they have venison, and then to go in search of more. Were they to be content with the product of their fisheries, they might build villages, and live easily and well, so productive are the boundless waters of the north; but they like variety of diet, and prefer the chase, with the hazard of occasional starvation which follows in its train.

"The villages of the Esquimaux are, therefore, a feature in their domestic economy in which they differ wholly with their neighbors. The houses framed strongly of drift timber, are covered thickly with earth, and are used only in winter. They have no windows, and are entered by a low side door, or, when they stand in situations where the

drift-snow lies deep, by a trap-door in the roof. The floor is laid with timber, and they have no fire-places; but a stone placed in the centre serves for a support to the lamp, by which the little cooking that is required is performed. For the site of a village, a bold point of the coast is generally chosen where the water is deep enough to float a whale; and to the eastward of Cape Parry, where we saw no whales, we met with no villages, although solitary winter-houses occur here and there on that coast. The association of a number of families is necessary for the successful pursuit of the whale. When the villagers of the estuary of the Mackenzie, or of Cape Bathurst, are fortunate enough to kill one or more of these marine beasts, they revel in greasy abundance during the dark months, and the ponds and the soil around are saturated with the oil that escapes.

"In March the seals have their young, and soon afterwards they become the principal objects of chase to the Esquimaux, who greatly esteem their dark and unsightly flesh, reckoning it as choice food. The seal, being a warm-blooded animal, respiring air, requires a breathing-hole in the ice, which it has the power of keeping open in the severest frosts by constant gnawing. It is a watchful creature, with acute senses of sight and hearing; but it is no match for the Esquimaux hunter, who has carefully studied all its habits from his infancy. As the days lengthen the villages are emptied of their inhabitants, who move seaward on the ice to the seal hunt. Then comes into use a marvellous system of architecture, unknown among the rest of the American nations. The fine, pure snow has by that time acquired, under the action of strong winds and hard frosts, sufficient coherence to form an admirable light building material, with which the Esquimaux master-mason erects most comfortable dome-shaped houses. A circle is first traced on the smooth surface of the snow, and the slabs for raising the walls are cut from within so as to clear a space

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down to the ice, which is to form the floor of the dwelling, and whose evenness was previously ascertained by probing. The slabs requisite to complete the dome, after the interior of the circle is exhausted, are cut from some neighboring spot. Each slab is neatly fitted to its place by running a flinching-knife along the joint, when it instantly freezes to the wall, the cold atmosphere forming a most excellent cement. Crevices are plugged up and seams accurately closed by throwing a few shovelfulls of loose snow over the fabric. Two men generally work together in raising a house, and the one who is stationed within cuts a low door and creeps out when his task is over. The walls being only three or four inches thick are sufficiently translucent to admit a very agreeable light, which serves for ordinary domestic purposes; but if more be required a window is cut, and the aperture fitted with a piece of transparent ice. The proper thickness of the walls is of some importance. A few inches excludes the wind yet keeps down the temperature so as to prevent dripping from the interior. The furniture, such as seats, tables, and sleeping-places is also formed of snow, and a covering of folded reindeer skin or seal skin renders them comfortable to the inmates. By means of antechambers and porches in forms of long, low galleries, with their openings turned to leeward, warmth is insured in the interior; and social intercourse is promoted by building the houses contiguous, and cutting doors of communication between them or by erecting covered passages. Storehouses, kitchens, and other accessory buildings may be constructed in the same manner, and a degree of convenience gained which would be attempted in vain with a less plastic material. These houses are durable, the wind has little effect on them, and they resist the thaw until the sun acquires very considerable power.

“The success of the seal-hunt depends much on the state of the ice, and should it fail, great misery results; the

spring being, in fact, the time of the year in which the Central Esquimaux incur the greatest risk of famine. When the thaw lays the ground in the valleys bare, rein-deer and wild-fowl return to the sea-coast, and plenty follows in their train."

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CHAPTER XXX.

The Western Indians and the North-West Mounted Police.

[THIS CHAPTER IS WRITTEN BY ALEXANDER BEGG, ESQ.]

Indians Previous to 1874—The Blackfeet—Their Number—Report of Rev. C. Scollen in 1876—Whiskey Traffic Destroys Many—Small-Pox—Results of Illicit Liquor Business—Mounted Police to the Rescue—Treaty in 1877—Location of the Tribes—Instructors in Agriculture and Stock-Raising—Text of Treaty—Yearly Subsidies—Ammunition—Salary of Teachers Paid—Supply of Tools, Stock, and Agricultural Implements—Agreement on Part of Indians—Success of this Policy—Opinion of Lord Lorne—Conduct of Hudson Bay Company Eulogized—Also that of Mounted Police—Increase of Latter to Five Hundred—Cost of Indians and of Police—Officers of the Force—New Headquarters—Indian Question still a Delicate one—Extract from *Toronto Mail*—Account of Distribution of Food—Contractors for Food Supply.

Up to the year 1874 the whole country adjacent to the Rocky Mountains, or the eastern slope, was occupied by Indian tribes. Buffalo and other large game had made those beautiful plains and fertile slopes their chosen home for unnumbered years, and had fattened and multiplied on the succulent and nutritious grasses which grow there in such luxuriance. Food was abundant; buffalo robes and skins for clothing, tents and lodges were plentiful. The aborigines were rich and happy after their own fashion, until the introduction of the whiskey traffic from the United States' territories bordering on the south.

The Indian tribes in this section of the Canadian North-West are the Blackfeet, Bloods, and Piegans, all branches of the same tribe; the Stony Indians and the Sarcees, a branch of the Peace River Indians, called Beavers.

In 1861 the Blackfeet, north of the international boundary line, numbered about ten thousand. They are represented as being "then a proud, haughty people, having a regular politico-religious organization, by which their thirst for blood and their other barbarous passions were constantly

fired to the highest pitch of frenzy. Since then their systematic organizations have fallen into decay, and they have been utterly demoralized as a people.

Their numbers at the last treaty payment in 1881, stood as follows:—

Bloods	3,000
Piegans	960
Blackfeet	1,700
Sarcees	479
Stonys	619

The aggregate number of Blackfeet, Piegans and Bloods it will be observed, was then only 5,660.

This great change and decadence are accounted for by the Rev. C. Scollen, who had for many years labored amongst the Blackfeet Indians as Roman Catholic missionary, and consequently was well acquainted with their habits and character. In a report which he made to Lieut.-Governor Laird, in 1876, he says, it was brought about by two causes: "First, about ten years ago the Americans crossed the line and established themselves on Belly River, where they carried on to an extraordinary extent the illicit traffic in intoxicating liquor to the Blackfeet. The 'fire-water' flowed as freely, if I may use the metaphor, as the streams running from the Rocky Mountains, and hundreds of the poor Indians fell victims to the white man's craving for money—some poisoned, some frozen to death while in a state of intoxication, and many shot down by United States bullets. Second, then in 1870 came that disease so fatal to Indians, the small-pox, which told upon the Blackfeet with terrible effect, destroying between six and eight hundred of them. Surviving relatives went more for the use of alcohol, they endeavored to drown their grief in the poisonous beverage. They sold their robes and horses by the hundred for it, and then began killing one another, so that in a short time they were divided into small parties, afraid to meet.

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"Fortunately for them the Government were aware of the state of affairs in the country and did not remain indifferent to it. In the summer of 1874, I was travelling amongst the Blackfeet. It was painful to me to see the state of poverty to which they had been reduced. Formerly they had been the most opulent Indians in the country, now they were clothed in rags, without horses and without guns. But this was the year of their salvation. That very summer the Mounted Police were struggling against the difficulties of a long journey across the plains to bring them help. The noble corps reached their destination that same fall, and with magic effect put an entire stop to the abominable traffic of whiskey with the Indians. Since that time the Blackfeet Indians are becoming more prosperous. They are now well clothed and well furnished with guns and horses. During the last two years I have calculated that they have bought 2,000 horses to replace those they had given for whiskey."

Treaty number seven was made at the "Blackfeet Crossing," Bow River, on the 22nd September, 1877, and included the Blackfeet, Blood, Piegan, Sarcee, Stony, and other Indian inhabitants of the territory north of the United States boundary line, east of the centre range of the Rocky Mountains, and south and west of treaties numbers six and four.

Those Indians have settled on their allotted Reserves—the Bloods on Belly River, south of Fort McLeod; the Piegans, on Old Man's River, west of McLeod; the Blackfeet at "Blackfoot Crossing;" the Sarcees on Irish River; and the Stonys at Morleyville, west of Calgary, on Bow River. The reserves assigned are of sufficient area to allow one square mile for each family of five persons, or in that proportion for larger and smaller families. Their title to the balance of the country is extinguished by the treaty, except "that they shall have right to pursue their voca-

tions of hunting throughout the tract surrendered, subject to such regulations as may be made by the Government, and saving and excepting such tracts as may be required or taken up from time to time for settlement, mining, trading, or other purposes by the Government or by any of Her Majesty's subjects duly authorized therefor by the Government of Canada.

On each Reserve there is an instructor, with one or two assistants, who are entrusted by the Government to impart instruction to the Indians, in reference to cultivating their Reserves, and in Stock-raising. Since the buffalo disappeared from this section of the country recently, rations of beef and flour are issued on Reserves to those who are unable to obtain supplies by hunting, or who have not raised enough produce to furnish required food. On several Reserves farther east, sufficient grain, roots, etc., have been grown to render the bands almost self-supporting.

The text of Treaty No. 7, which is somewhat similar to that of the former Treaties with other tribes, is as follows :—

“In view of the satisfaction of Her Majesty with the recent general good conduct of Her said Indians, and in extinguishment of all their past claims, she hereby, through the Commissioners, agrees to make them a present payment of twelve dollars each, in cash, to each man, woman, and child of the families here represented.

“Her Majesty agrees that next year, and annually afterwards, forever, she will cause to be paid to the said Indians, in cash, at suitable places and dates, of which the said Indians shall be duly notified, to each Chief, twenty-five dollars, each minor Chief or Councillor (not exceeding fifteen minor-chiefs to the Blackfeet and to the Stony Indians,) fifteen dollars, and to every other Indian of whatever age, five dollars; the same, unless there be some exceptional reason, to be paid to the heads of families for those belonging thereto.

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"Further, Her Majesty agrees that the sum of two thousand dollars shall hereafter, every year, be expended in the purchase of ammunition for distribution among the said Indians; provided, that if at any future time, ammunition become comparatively unnecessary for said Indians, her Government, with the consent of said Indians, may expend the proportion due to such band otherwise for their benefit.

"Further, Her Majesty agrees that each head-chief and minor-chief, and each chief and councillor duly recognized as such, shall, once in every three years, during their term of office, receive a suitable suit of clothing; and each head-Chief and Stony Chief, in recognition of the closing of the treaty, a suitable medal and flag; and next year, or as soon as convenient, each head-chief and minor-chief, and Stony chief, shall receive a Winchester rifle.

"Further, Her Majesty agrees to pay the salary of such teachers to instruct the children of said Indians, as to her Government of Canada may seem advisable, when said Indians are settled on their Reserves, and shall desire teachers.

"Further, Her Majesty agrees to supply each head and minor-chief, and each Stony chief, for the use of their bands, ten axes, five hand-saws, five augers, one grindstone, and the necessary whetstones.

"And, further, Her Majesty agrees that the said Indians shall be supplied, as soon as convenient, after any band shall make due application therefor, with the following cattle for raising stock, that is to say: For every family of five persons, and under, two cows; for every family of over five persons, and less than ten persons, three cows; for every family of over ten persons, four cows; and every head and minor chief, and every Stony chief, for the use of their bands, one bull; but if any band desire to cultivate the soil, as well as raise stock, each family of such band

shall receive one cow less than the above mentioned number, and in lieu thereof, when settled on their Reserves and prepared to break up the soil, two hoes, one spade, one scythe, and two hay-forks; and for every three families, one plough and one harrow; and for each band, enough potatoes, barley, oats, and wheat (if such seeds be suited for the locality of their Reserves), to plant the land actually broken up. All the aforesaid articles to be given, once for all, for the encouragement of the practice of agriculture among the Indians.

“And the undersigned Blackfeet, Blood, Piegans, and Sarcee head chiefs and minor-chiefs, and Stony chiefs and councillors, on their own behalf, and on behalf of all other Indians inhabiting the tract within ceded, do hereby, solemnly promise, and engage to strictly observe this treaty, and also to conduct and behave themselves as good and loyal subjects of Her Majesty the Queen. They promise and engage that they will, in all respects, obey and abide by the law; that they will maintain peace and good order between each other and between themselves and other tribes of Indians, and between themselves and others of Her Majesty's subjects, whether Indians, Half-breeds, or Whites, now inhabiting, or hereafter to inhabit, any part of the said ceded tract; and that they will not molest the person or property of any inhabitant of such ceded tract, or the property of Her Majesty the Queen, or interfere with or trouble any person passing or travelling through the said tract or any part thereof; and that they will assist the Officers of Her Majesty, in bringing to justice and punishment any Indian offending against the stipulations of the treaty, or infringing the laws in force in the country so ceded.”

Hitherto the Dominion Government has been highly successful in their dealings with the Indians. Their policy has been conciliatory and patriarchal. By prudent arrange-

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ment peaceful possession has been obtained of the whole territory. Wild and cruel savages have been brought under the influences of civilization. Many tribes are abandoning the precarious mode of living by the chase, for the more reliable returns from the cultivation of the soil and raising domestic herds.

Lord Lorne, Governor General of Canada, in his admirable speech delivered at Winnipeg on his return from a round tour by the Rocky Mountains, in July, August, September, and October, 1881, embracing a drive of nearly 1,500 miles across the western prairies, refers to the subject as follows:—"Let me advert for one moment to some of the causes which have enabled settlers to enjoy in such peace the fruits of their industry. Chief amongst these must be reckoned the policy of kindness and justice which was inaugurated by the Hudson's Bay Company in their treatment of the Indians. Theirs is one of the cases in which a trader's association has upheld the maxim that 'honesty is the best policy,' even when you are dealing with savages. The wisdom and righteousness of their dealing on enlightened principles, which are fully followed out by their servants to-day, gave the cue to the Canadian Government. The Dominion to-day through her Indian officers and her mounted constabulary is showing herself the inheritress of these traditions. She has been fortunate in organizing the Mounted Police Force, a corps of whose services it would be impossible to speak too highly. A mere handful in that vast wilderness, they have at all times shown themselves ready to go anywhere and do anything. They have often had occasions demanding the combined individual pluck and prudence rarely to be found amongst any soldiery; and there has not been a single occasion on which any member of the force has lost his temper under trying circumstances, or has not fulfilled his mission as a guardian of the peace. Severe journeys in winter and difficult arrests have had to

be effected in the centre of savage tribes, and not once has the moral prestige, which was in reality their only weapon, been found insufficient to cope with difficulties which, in America, have often baffled the efforts of whole columns of armed men. I am glad of this opportunity to name these men as well worthy of Canada's regard—as sons who have well maintained her name and fame.”

His Excellency paid a high and deserved compliment to the Hudson's Bay Company, and one equally deserving to the Mounted Police Force. But for them the country, at least in the far west, would have yet been a *terra incognita*, in a state of anarchy and demoralization. There would have been no safety for either life or property. The officers of the North-West Mounted Police are men of experience and tact. Their prudence and courage have been proved on many occasions. The names of the Commissioner, Col. Irvine, Superintendent and Adjutant Cotton, and Superintendent Crozier, have frequently been mentioned in the public press in connection with the meritorious discharge of their duties.

In view of an expected large increase of population, and a great importation of cattle, sheep, and horses, it has been decided by the Government to increase the force to 500 men. To meet the cost of the consequent expenditure, \$90,000 have been placed in the supplementary estimate for the year ending 30th June, 1882. The estimated expense of the management of the Indians in Manitoba and the North-West Territories for the year ending 30th June, 1883, is set down at \$830,500. The sum required for the Mounted Police for the same year is \$413,000.

The present officers of the North-West Mounted Police, as gazetted January 28th, 1882, are as follows:—

Commissioner: Acheson Gosford Irvine, appointed 1st November, 1880.
Superintendents: James Murrow Walsh, 1st June, 1874; Lief N. Fitzroy Crozier, 11th September, 1874; William Macaully Herchmer, 1st August, 1876; Albert Shurtliff, 24th January, 1882; John Henry McIlree, 26th January, 1882; Alexander McKenzie, 24th January, 1882.

Superintendent and Adjutant, John Cotton, 1st January, 1882.
 Senior Surgeon : Augustus Jukes, M.D., 24th January, 1882.
 Assistant Surgeons : Robert Miller, M.D., 20th October, 1875; George A. Kennedy, M.D., 1st October, 1878.
 Inspectors : John French, 30th March, 1874; Sévère Gagnon, 3rd April, 1874; Edmond Fréchette, 11th September, 1874; Francis Jeffrey Dickens, 4th November, 1874; Arthur Henry Griesbach, 1st June, 1875; William D. Antrobus, 1st March, 1876; Percy Reginald Neale, 1st July, 1876; Samuel B. Steele, 31st August, 1878; Alexander R. Macdonell, 1st September, 1878; Thomas Dowling, 15th September, 1878; Aylesford Bowen Perry, 24th January, 1882; Henry Romeo Prévost, 25th January, 1882; Frank Norman, 24th January, 1882.

The distribution of the Force will be changed from time to time, according to the movements of the Indians and the tide of immigration. During the years 1882 and 1883, the chief locations will be at Fort McLeod and at Fort Calgary. Fort Walsh, the present headquarters, will be reduced to a few men, if not abandoned altogether, as the causes which necessitated its establishment, namely, the arrival of refugee Indians from the United States, have passed away.

The Indian question continues to be one of great delicacy. The natives have to be dealt with like children. It will require some years of careful, patient management to bring them fairly within the pole of civilization. As yet the Blackfeet, Bloods, and Piegans practise polygamy, and have their annual "sun dance," when all their brave deeds are recounted.

The correspondent of the "Toronto Mail," writing from Fort McLeod, in September, 1881, says: "Farther down the Old Man's River, about twelve miles west of Fort McLeod, I reached the Piegan Indian Reserve, where there are about 900 Indians, under the superintendence of Mr. Kettles. On this Government farm there is a good crop this year, and a few of the Indians on the Reserve have raised some oats, potatoes, etc. They seem well disposed and willing to help themselves, but it is no easy matter to get rid of their old habits and fall into new. I happened to be present at one

of the regular semi-weekly ration distributions. Four fat cattle were killed on this occasion—two carcasses were to be kept over until next day. The butchering was speedily performed by the Indians. A bullet fired at the head of each of the cattle, produced instantaneous death. Mr. Kettles brought down one by a bullet which struck direct in the animal's forehead. Three Indians followed suit with their rifles, and brought down the other three. In less than two minutes, the work of skinning commenced. Three or four Indians around each beast soon took the hide off, and before the flesh had ceased to quiver, the entrails were out, and divided amongst the hungry crowd. They seemed very fond of tripe, and appropriated every solid particle, except the horns and hoofs. Fires were kindled, and pieces of meat partially cooked over the burning sticks, were eaten with great relish. Choice portions were chewed raw and considered a good treat. It took the greater portion of the forenoon to apportion the rations of beef and flour to each family, but the agent seemed quite at home in the work."

The beef and flour for the different reserves, included in treaty number seven, have hitherto been supplied under contract by Messrs. I. G. Baker & Co., of Fort Benton, Montana.

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CHAPTER XXXI.

Steamboats and the Development of our River and Lake Navigation.

First Steamboat on Red River—Attempts to Establish a Trade—Want of Success—Opening of the Northern Pacific—Regular Trade Established on Red River in 1872—In Three Years it Increases to 50,000 Tons—Doubts cast on the Navigation of the Red and Saskatchewan Rivers in 1876—Mr. Trow's Statement made in 1877—Red River Fleet in 1879—Navigation of Lake Winnipeg—Assiniboine Opened up—Its Capacity and Present Facilities—The Qu'Appelle and Souris—The South Saskatchewan—North Saskatchewan—Steam Navigation on the Athabasca, on Peace River, on the Mackenzie—Lake Athabasca and Great Slave Lake—Impediments to Navigation—The Future of the Lake and River Trade—Summary of Navigable Waters.

UP to the year 1859 no attempt had been made to put steamboats on Red River, and not a few in the colony derided the idea as preposterous, and maintained that the river was too shallow, too crooked, and too full of snags. One morning early in June of that year the colony was unexpectedly greeted with the whistle of the steamboat, and the "Anson Northrup" tied up at Fort Garry. This boat was brought at great expense by the proprietors from the St. Peter's River, and taking advantage of the spring floods reached the Fort. Its arrival was treated as a great event. The cannon of the fort thundered out a welcome, and bells pealed forth a merry chime as a signal of rejoicing.

The arrival of the "Anson Northrup" inaugurated a new era for the trade of the Red River Colony. When the Hudson's Bay Company saw the success of this venture they determined to try the river for their trade. With this object in view they acquired some property opposite River au Boeuf, 200 miles south of Fort Garry, and commenced a town which they named Georgetown, in honor of Sir George Simpson. Messrs. Burbank & Co. of St. Paul, established a stage line between Georgetown and

St. Paul, and communication was opened with the outside world.

A few trips were made in 1860. During the next season the boat made regular trips between Georgetown and Fort Garry. The stages continued to run to St. Paul, so that the trip from Red River to Montreal could be made in twelve days.

In the spring of 1862 the "International" was launched at a cost of \$20,000, and commenced to make regular trips. Owing to the Sioux massacre and various other causes, the navigation of the river was not a success, and little freight offering, her trips almost ceased. Trade languished until 1872, when the Northern Pacific Railway reached Moorehead from Duluth. As soon as the railway was opened the trade on the river took a fresh start, and Kittson at once took advantage of the new impulse given by the railway to perfect arrangements for regular traffic.

During the year 1872 immigrants began to pour into Manitoba, some going by the Dawson route, while others came by railway to Fargo and thence down the Red River to Winnipeg, which now began to be spoken of in connection with the west. In 1875 trade had increased to such an extent that Kittson, or the Red River Transportation Company, carried no less than 50,000 tons of freight on Red River that year. I heard him make the remark that on the Red River, between Fargo and Winnipeg, more merchandise had been carried that season than on the Mississippi between St. Paul and St. Louis.

So little did our own people know of our resources and the capabilities of the country, that in February of the next year, when delivering a public lecture in the City of Ottawa, I was publicly contradicted for stating that the Red River in Canadian territory was navigable the whole season. In the fall of 1875 I happened to be at Carlton when the "Northcote" reached that Fort with a heavy load of freight.

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That same winter I was examined before a Committee of the House of Commons, and stated in answer to a question regarding the navigation of the Saskatchewan, that in my opinion, the navigation of that river was an accomplished fact, with the exception of the Portage, at the Grand Rapid.

Again my statements were called in question, and one of the Members from Manitoba, actually charged me with falsehood in making the assertion.

In the summer of 1871, Mr. James Trow, M.P., Chairman of the same Committee before which I had been examined the preceding year, wrote as follows from Carlton, where I had seen the boat two years ago: "The North Saskatchewan is a much larger stream than the south branch. It is between 400 and 500 yards broad at Carlton, from ten to twenty feet in depth, and runs with a swift current. This noble river is navigable from Lake Winnipeg, or from the head of the Grand Rapids, far beyond Edmonton. The Hudson's Bay Company's steamer "Northcote" made several successful trips during the present season, and carried immense cargoes to the various forts along the river to Edmonton. This gives the Company a monopoly over traders. Freight charges by land carriage from Winnipeg to Carlton, are from five and a half to six cents per pound. A barrel of flour that cost ten dollars, would readily sell in Carlton for twenty-five dollars. Freight charges are regulated at so much per pound, therefore a pound of nails would cost precisely the same for freighting as a pound of flour or pork. Mr. Clarke and others have informed me, that with an expenditure of from \$10,000 to \$15,000, the river could be made navigable for ordinary sized vessels, from Grand Rapids to the foot of the Rocky Mountains. The Hudson's Bay Company have, this season, constructed a steel steamboat at Grand Rapids, 100 feet in length by 18 foot beam, for the carrying trade between Carlton and Edmonton. This boat is of light draught, and was made by

a firm in London, who are also engaged constructing similar vessels for navigating the rivers of Central Africa and Brazil. The Hudson's Bay Company have, during this season, constructed a railway across the portage connecting Lake Winnipeg with the Saskatchewan, above Grand Rapids. These falls are a succession of rapids for several miles. Tobin Falls, near Cedar Lake, and the falls at Fort la Corne, consist of loose boulders which could easily be blasted and removed. Some dredging would be requisite at places where the waters of the river are subdivided by islands, shoals, and sand-bars."

Scarcely another year passes, when a gentleman, residing in St. Paul, takes up the subject, and in the winter of 1878 writes: "There are now in the waters of the Province and its tributary trade, a fleet of seventeen steamers. They are the "Manitoba," "Dakota," "Selkirk," "Minnesota," and fourteen barges of 1,800 tons capacity, of the Kittson or Red River Transportation Company, which will run from the Northern Pacific Railway, crossing the Red River at Fargo, and from Fisher's Landing, on the Red Lake River, the terminus of a branch of the St. Paul and Pacific Railway, on that river, down the Red to Manitoba. The steamer "Grandin," an independent boat, is owned by the Great Grandin Farm, on the Red River, thirty miles below or north of Fargo. The above are American boats—and the "Alpha" and "Cheyenne" of the Winnipeg and Western Transportation Company, running in the Assiniboine and lower Red River, together with the "Swallow," "Prince Rupert," "Keewatin," "Ellen," and a new boat just building, which will also run in the lower Red. These are Canadian boats, while a boat is nearly finished to run on Lake Manitoba."

The Hudson's Bay Company own the Propeller "Colville," that runs up Lake Winnipeg to their various posts, and forms a connection at the mouth of the Saskatchewan,

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with their two river steamers, the "Northcote" and "Lilly," the latter a steel hull. These two boats are the beginning of a regular line up the latter river. Beside the above named boats, two other boats have been built, one for the Red River, called the "Maggie," now used as a barge, and the "Chief Commissioner," for the lake trade; the latter's model being defective, she is now doing duty as a river wharf boat. So that in all, there are and have been some nineteen steamers in these waters. The regular passenger steamers in these lines are models of beauty, speed, and comfort, with officers who are gentlemen, as well as thorough and experienced boatmen.

Early in the spring of 1879, the cars reached Winnipeg, and at once, the attention of steamboat owners was turned to the Navigation of the Assiniboine. The preceding year, Rapid City had been founded, and to supply the settlers and carry up immigrants, boats were chartered for the foot of the Assiniboine Rapid, eight miles above the mouth of the Souris. Captain Webber, of the steamer "Marquette," examined the Rapid, and decided to ascend it the next trip, if he could secure freight for Fort Ellice. On his return to Winnipeg, he stated what he believed he could do, and the Hudson's Bay Company at once furnished the freight. His trip was successfully accomplished, and on his second trip I accompanied him. A few days after, the "Alpha" also ascended to Fort Ellice, and the navigation of the river was an accomplished fact.

As is usual, with all new ventures many wise men expressed opinions in opposition to the success of the enterprise, but their wisdom was completely at fault. In their estimation, the river was too narrow, too crooked, and too shallow, but experiment once made set all these objections at rest, and an immense trade was done during the summers of 1879-80-81. In September of the latter year, the Canadian Pacific Railway was opened to Brandon, 145 miles west of

Winnipeg, and six miles above the Assiniboine Rapid. The steamer "Alpha" continued her trips between Brandon and Fort Ellice, until winter set in, and now lies in the river above Brandon.

Of the Assiniboine, above Fort Ellice, very little was known other than that in general appearance it was like that below Fort Ellice. Last July, during high water, the "Manitoba" was taken up to Fort Pelly, a distance in a direct line from Fort Ellice of 120 miles. Little difficulty was experienced other than that occasioned by high water, but owing to the extreme crookedness of the river above the mouth of the White Sand, it is likely navigation will cease fifteen miles south of Fort Pelly.

Many contrary opinions are expressed regarding the navigation of this river, but, having descended it from Fort Pelly to Winnipeg, I can state with perfect truth, that no worse obstructions exist above Fort Ellice than are to be found below Brandon. These have been overcome without any attempt to remove the obstructions, and the same can be said of those above. The upper rapids are composed of sand and gravel, and no difficulty will be experienced in making a good channel. During the last week in September of last year, the water on the rapids was swift, but not broken, and neither danger nor difficulty was experienced in running them in a small canvas boat.

Current opinion makes the Souris navigable for a long distance, even to the International Boundary. At its mouth it is 135 feet wide, and over three feet deep in the channel. Prof. H. Y. Hind, in his report on this and the adjoining regions, says of this river: "At its mouth, the Little Souris is 121 feet broad, three feet six inches deep in the channel, with a mean sectional depth of two feet four inches, and a current of half a mile an hour. Near Snake Hill, sixty-one miles from the outlet, the river valley is only 110 yards broad, and sixty-six feet deep, with

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open prairie on both sides. The river here is 100 feet broad, and four feet deep in the channel. The length of the Souris, within British territory, is 106 miles. At the mouth of the Souris, the Assiniboine was found to be 230 feet broad, with a mean depth of six feet, and a current of a mile and a quarter per hour." Palliser found it a considerable stream, and in his Journal says: "It is a considerable stream, being about 150 feet wide and about four feet deep at the shallowest place (August 11th, 1857,) we could find to ford it. We were obliged to skirt the river for several miles before making this discovery, and even then a portage was necessary before we could reach the opposite bank." From the foregoing it is obvious that in general the river is quite deep enough for river steamers, and should the rapids which are said to exist some distance above its mouth be found passable, another 100 miles will be added to the river navigation.

The Qu'Appelle region and river at present attract much attention, and the feasibility of navigating this river is likewise talked about. Of late years exploration has not been directed to the waters of the country, so that in our attempts to get at the truth regarding this and other streams, we must call to our own aid the work of twenty-five years since. In July, 1858, Mr. Dickinson descended the river from Qu'Appelle, and carefully noted its mean depth and breadth. With the exception of a boulder rapid at the foot of Round Lake, about fifty miles from Fort Ellice, no obstructions to navigation were noted. "For the whole distance from the Fisher, Lakes to the mouth of Big Cut Arm Creek River was found to vary in breadth from seventy to one hundred feet, with a depth of from four and a half to two feet. The bed for the most part consisted of soft mud and was quite free from boulders, as is the case the whole way to the mouth, excepting the rapid below Round Lake. About two and a half miles below the lake the river

bed is filled, for about 100 yards, with large and small granite boulders, rendering it quite impassable for the smallest canoe when the water is low. From the mouth of Big Cut Arm Creek, a distance of twenty miles, the river varies in breadth from seventy to ninety feet, and is from eight to twelve feet deep, with a current of about one and a half miles per hour."

The Qu'Appelle Lakes, partly on account of their position and value as fisheries in the future, are worthy of a passing notice. It will be remembered that the Qu'Appelle valley varies from a mile to a mile and a half in breadth, and from 250 to 300 feet in depth. Less than fifty miles from the mouth of the river is Round Lake, which varies from one mile to half a mile in width, and about five miles in length. Its mean depth is about twenty-eight feet. At its head are sand banks, which are the resort of large numbers of water fowl. Eight or ten miles higher up the river is Crooked Lake—a most lovely spot but nearly all included in an Indian Reserve. This lake is rather longer than the other but scarcely so wide and much deeper, having a mean depth of thirty-one feet, though some soundings give forty feet.

The Four Fishing Lakes are very beautiful, and as if it were to enhance their value and add to their beauty, the Qu'Appelle Mission and Hudson's Bay Company's Stores, the Police Barracks, and many other buildings are placed between the Second and Third Lakes. The consecutive length of the four lakes is over twenty-four miles, with the village nearly in the centre. The mean depth varies from thirty-two feet in the second lake to fifty-two feet in the first lake. In the future many fine residences will be built along these lakes, and yachts and steamboats will be seen gliding over their waters.

Unless a channel be cleared out in the rapid below Round Lake, no steamboat can ascend higher than that point, which as I said above, is fifty miles from the mouth of the river.

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While exploring the great Buffalo Plains in 1879, I was particular to make inquiries regarding the navigation of the South Saskatchewan, and in my report to the Government for that year made allusion to it in the following words:—
“ We pitched our camp on the hill-top, about a mile and a half from the river, near a good spring in a coulée. Beneath us lay the mighty Saskatchewan, rolling its turbid flood between banks 250 feet high, seeming altogether out of place in this arid region. The river at our crossing was 770 yards wide, and the main channel over which our horses had to swim was not less than 500 yards. Shoals and sand-bars were numerous, with occasional islands, but nothing to indicate that the river at this point was unsuited for navigation.”

Why the south branch should be thought unfit for navigation, I cannot understand. Mr. Hind who passed down the river in August, 1858, never speaks of its depth as being less than seven and a half feet; and the current as never more than three miles an hour, except when close to the North Branch.

Palliser, who crossed the river about twenty miles above me, on 28th September, 1857, states that the water in the middle of the channel, where they lost their waggon, was twenty feet deep.

While on the plains I never heard of the river being fordable below the mouth of the Red Deer River. Palliser crossed it on a raft, 22nd July, 1859, about sixty miles above that point where the river was 250 yards wide, and from five to eight feet deep. When at the Blackfoot Crossing of the Bow River, a branch of the South Saskatchewan, 27th August, 1879, I found that it was with the utmost difficulty that horses could cross without swimming. No person ever mentions a rapid being anywhere in the river below this, so that I have come to the conclusion that there is nothing to prevent all the supplies wanted for the southwest being

sent up the South Saskatchewan. Coal is abundant in the river banks at the Blackfoot Crossing and farther eastward, so that there will be no difficulty as to fuel for steamers. Should an attempt be made to navigate the river, it will be found to have better water for a longer period of the year than the North Saskatchewan, as its head waters drain a greater extent of the mountains.

Further on in the same report I say: "In my Journal, I showed why I believed the South Saskatchewan was navigable, and I now reiterate the statement, after a careful review of all said for and against it. When its navigation is an accomplished fact, all supplies for the police and Indians can be taken to within less than thirty miles of Fort Walsh at Cypress Hills, and those for Fort McLeod, landed at the Forks of Bow and Belly Rivers within two short days' journey of the Fort. Here (at the Fort) is abundance of coal, so that there will be an ample supply of fuel for all purposes. It is currently reported that all the settlers in the vicinity of the Fort, burn this coal. Messrs. Patrick and Nelson, two surveyors whom I met at Morleyville, told me that they had discovered coal in numerous places south of my line of exploration. In view of the difficulty of supplying the Indians, and the importance of opening up the country, I would suggest that an attempt be made, at an early day, to solve the problem, by sending one of the steamers now plying on the Assiniboine on that service. That the ascent can be made without any more difficulty than that experienced in ascending the North Saskatchewan, I am quite sure, as I have had an opportunity of seeing both rivers. Red Deer, Bow, and Belly Rivers, all issuing from the mountains, must send more water into the main channel late in the season, than the north Branch, and, therefore, this river will be longer open for navigation every season. If the coal deposits can be developed by this means, all the prairie land seen by me will become, in the course of years,

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thickly settled with a prosperous population, as there is no physical defect in the country but the want of wood."

For five years past, an iron steamboat, named the "Lily," has been running on the North Saskatchewan, and has been generally successful. No survey of the river having ever been made, it is a matter for congratulation that success, so far, has crowned the efforts of the Hudson's Bay Company. During the coming year, owing to the extension of settlement and the increase of trade, a number of boats are to be placed on the river above the Grand Rapid, part of which are intended to run on the South Saskatchewan, and part on the North Saskatchewan.

The Grand Rapid alluded to above is situated less than three miles from Lake Winnipeg. Its total length is two miles and three quarters, and the total descent forty-three feet and a half. The breadth of the river varies in the rapid, being at the head about twenty chains, at the narrowest part ten chains, and at the foot of the rapid twenty-five chains. The above measurements are taken from the Report of Mr. John Fleming, C. E., who thus relates his experience in running the rapid:—

"In running the rapid, we followed, as closely as possible, the instructions given to us by our old guide on the Plains (John Spence), who had often piloted the old North-West Company's "North" canoes down its entire length. In attempting, according to his directions, to cross from the north to the south side of the rapid, in order to get into what was reported, to be the best channel for a small canoe, such was the fierceness of the current, and the turbulence of the great surges and breakers in the middle, that we were nearly engulfed; and although every nerve was strained, we were swept down with impetuous velocity, and did not get near the other side till we were about three quarters of a mile below our starting point. We were then impelled with astonishing swiftness along the south side of the ter-

rent, often in dangerous proximity to the rugged wall of rocks bounding the channel, and now and then whizzing—almost grazing—sharp rocky points jutting out into the river, against which the thundering waters seethed and foamed in their fury. During the descent, the voyageurs exerted themselves to the utmost of their strength, and evinced an admirable degree of coolness and dexterity.”

An approximate estimate of the number of cubic feet of water passing down the South Branch, the North Branch, and the Main Saskatchewan, made by Prof. H. Y. Hind, in 1858, gives the following result:—

CUBIC FEET PER HOUR.	
South Branch.....	123,425,616
North Branch.....	91,011,360
Main Saskatchewan, at Fort à la Corne.....	214,441,290
“ “ near Dearing River.....	206,975,000

The Athabasca, like the Saskatchewan, is a first-class river, and being without rapids, is far more suitable to steamboat navigation than the latter. This river rises in the Rocky Mountains, above Jasper House, and shortly after issuing from the mountains, becomes an important stream. At Fort Assiniboine, ninety miles northwest of Fort Edmonton, the Athabasca is a much larger stream than the North Saskatchewan. Here it is not less than 300 yards wide, and so deep that our horses had to swim from bank to bank. From here to Lake Athabasca, a distance of over 400 miles, there is not the slightest impediment to steamboat navigation, except a short rapid a little north of Lake la Biche.

While at the Forks of the Athabasca and Clear Water, in 1875, Mr. Moberly, who was in charge of Fort McMurray at the Forks, informed me that he had sounded the Athabasca, at the instance of the Hudson's Bay Company, all the way from the Forks to the Lake, a distance of 180 miles. The soundings were made at the lowest stage of water, and he reported that a steamboat drawing six

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feet of water could run at any stage of the water. Below the Forks it is a majestic stream, and flows with a quiet, steady motion, with an average breadth of a quarter of a mile. Its current is so slight that, in 1875, we sailed up the river with three York boats belonging to the Hudson's Bay Company. No difficulty, so says Mr. Moberly, will be experienced in ascending the river far above Fort Assiniboine, as the river is remarkably free from bars and other obstructions.

The same steamboat could run from the forks of the Athabasca and Clearwater, a distance of 180 miles, the whole length of the Lake Athabasca, at least 250 miles, up the Peace River to Little Red River as far as the rapids, in all, not less than 700 miles of river navigation could be performed without any difficulty by the same boat. When we consider the development that would follow from the opening up of the Athabasca we can easily conceive that this matter will not be long delayed. Seven years since the Hudson's Bay Company contemplated placing a boat on this route, but it is presumed that the great and sudden development of the eastern part of the country has left this section in the background for the present.

Peace River, between Hudson's Hope and Little Red River, a distance of 500 miles, is without an obstruction of any kind except occasional short rapids or strong currents caused by gravel bars in the river. These disappear about 100 miles east of Dunvegan, and until the Falls at Little Red River are reached, the majestic stream is without the slightest obstruction. It winds in graceful curves with scarcely any current through a beautiful valley, and having a lovely country on either hand.

The volume of Peace River is evidently greater than that of the united Saskatchewan, and owing to its sources being far west of the mountains and in a country with a greater rainfall than that to the eastward, it ought to be less sub-

ject to low water. That this is the case seems probable from the fact that the water was so high in October, 1872, that the Hudson's Bay Company's boats could not be taken above Dunvegan, the bars being all covered with water. Having descended the river from the mountains to Lake Athabasca, I can speak with certainty of its value as a navigable stream.

After passing the rapids on Slave River there seems to be no further impediment between that point and the Arctic sea, a distance of nearly 1000 miles, except the "Rapid" which is north of the Arctic Circle. Much has been written about the advantage to Siberia of the opening up of the rivers Lena and Yenesei, yet the accessibility of the Mackenzie from Behring's Straits has been strangely overlooked. No Arctic explorer ever found any difficulty in bringing his ships to the eastward of the mouth of the Mackenzie, and there is no valid reason why steamships could not run between Behring's Straits and the mouth of the river every season. These vessels could ascend the river possibly 1000 miles and winter at Fort Simpson if necessary, or they could spend the summer catching whales off the coast, and retreat to the river before winter set in. Very few years will elapse before some adventurous person will prove the ease with which the voyage can be made, and the mists that have hung for ages over this distant region will forever be dispelled.

Sir John Richardson writes of the navigation on the rivers at the "Rapid" in the following words:—"In the earlier part of the summer a steamboat could ascend the rapid without difficulty, and this great river might be navigated by vessels of considerable burden, from the Portage of the Drowned in Slave River, down to its junction with the sea, being a navigation of from 1,200 to 1,300 miles.

"In a dilatation of the river, about ten miles below the rapid, bituminous shale lies horizontally in the hollows of indulated beds of limestone. Having cooked supper at this spot we embarked to drift for the remainder of the night.

"At five in the morning of the 28th we were at the commencement of the Ramparts, where the river is hemmed in to the width of from 400 to 800 yards, and has a strong current. This is the "second rapid" of Mackenzie, who states that it is fifty fathoms deep; but in obtaining such soundings his lead must have fallen into a crevice or have been carried down the channel of the stream by the strength of the current; for gentlemen of the Hudson's Bay Company, who are well acquainted with the locality, informed me that a bed of stone crosses the stream, and at the close of the summer when the river is at the lowest, produces a fall, except on the east side where there is a channel that boats can ascend by towing."

Scarcely ten years have elapsed since steamboats began to run regularly on Red River, and now there is a large fleet, which is every year increasing and extending its lines of traffic. The following summary of the lake and river navigable waters of the interior may be interesting if not instructive. At present the construction of railways, and the activity imparted to many lines of business on that account, will cause more attention to be paid to numerous rivers, which have been scarcely thought of for the purpose of trade.

Summary of Navigable Waters.

	MILES.
Lake Winnipeg.....	300
Lakes Manitoba and Winnipegosis.....	230
Red River, (within Manitoba).....	90
Assiniboine River.....	350
Souris River (Probable).....	120
Qu'Appelle River and Lakes.....	200
Long Lake.....	40
Main Saskatchewan.....	400
North Saskatchewan.....	800
South Saskatchewan.....	1000
Athabasca River and Lake.....	500
Peace River.....	700
Mackenzie River and Slave Lake.....	1500
Little Slave Lake.....	75
Total.....	6305

As a fitting conclusion to this chapter, I give the following extracts from the evidence of Prof. H. Y. Hind, before a Committee of the House of Commons, in the year 1878. The pamphlet from which they are taken is entitled: "Navigation of Hudson's Bay," and was published by authority in Ottawa, in that year. The extracts are condensed, but the words are those of Prof. Hind, who certainly knows of what he speaks:—

Letter to Colonel Dennis.

"DEAR COLONEL DENNIS,—Your very interesting letter of the 18th inst., is just received, and I hasten to reply to the enquiry as to whether I have any information to communicate, gathered on the Labrador coast or elsewhere, as to the facilities for effecting commercial communication with the North-West Territories *via* Hudson's Bay

"The subject is one to which I adverted in a paper read May, 1864, or fourteen years ago, before the Statistical Society, in London, a copy of which I now send. You will find the reference at page 101. I still consider that York Factory will become the 'Archangel of the West.'

"During the past three years, my views on the subject have undergone a progressive change, all tending towards confirming the opinion of the adoption ultimately of the Hudson's Bay route as a commercial highway between Central British America and Europe. The facts which have led to this decided opinion are briefly, as follows:—

"1st. The general and successive employment of large steamers properly constructed for ice-encounter, by the Newfoundland, British, and Norwegian sealers. The safety of these vessels, and the experience required in the management of a steamer in ice-encumbered seas.

"2nd. The present cheapness and easy management, on board a steamer, of the magneto-electric light, for use on such steamers, and for temporary powerful light-house purposes.

"3rd. The alleged discovery, on high authority, of lignite coal over wide areas, from Cape Walsingham to Frobisher Bay, just north of Hudson's Straits, as well as on the West Greenland Coast.

"4th. The better knowledge now possessed of the proper mode and time for navigating Davis' Straits, in approaching Hudson's Straits.

"5th. The great fishing resources of Davis' Straits, in and towards Frobisher Bay.

"6th. The sources of the ice drift on the Labrador coast, its course in Hudson's Straits, and the mode of avoiding it in summer and autumn, or crossing it where it is narrowest.

"7th. From all I have gathered respecting the navigation of Hudson's Straits and its approaches from the east, there appears to be no difficulty in navigating them, from July to October, with a *sealing steamer*, especially if provided with a magneto-electric light for use in September and October.

"When we consider that York Factory is actually nearer to Liverpool than New York, it surely becomes a question of the greatest moment to determine how far existing information would warrant minute enquiry into this very important subject. As

the result of a prolonged but desultory study of the question, I have no doubt that continuous and safe navigation by steamers, constructed as sealing steamers are, can be carried on between Port Nelson and Liverpool, for at least four months in the year—that is, from Liverpool to Liverpool again, leaving three months, or perhaps a little more for Hudson's Bay.

"Such a navigation, would, in effect, bring a thousand miles of sea coast line, now included in Ontario and Keewatin, into direct water communication with the outer world, and develop new interests in the North-West, apart from the outlet it would afford to its grain. The lignite coal, on the west side of Davis' Straits, is of importance in this connection.

"I enclosed a tracing of a map, prepared some time since, showing the alleged position of some of the coal beds, and the two routes to Liverpool.

"It is needless to say that the proper amplification of the points advanced in preceding paragraphs would occupy considerable time. I have marked in pencil Back's drift in H. M. S. "Terror," imbedded in ice, from Cape Comfort, Southampton Island, past Nottingham Island, and into Hudson's Straits, from the 1st September, 1836, to July 17th, 1837. The literature on the physics of these waters is not condensed, and must be collected and arranged from many different but available sources.

"Yours, very sincerely,

(Signed,) HENRY Y. HIND.

"COLONEL DENNIS, Surveyor-General, Ottawa.

"Question 2.—Where would be your point of departure in Hudson's Bay, and what are the objects proposed to be gained by the route you contemplate?

"Answer.—On the 15th August, 1612, Captain Thomas Button, seeking for a harbor on the west coast of Hudson's Bay, in which he might repair damages incurred during a severe storm, discovered the mouth of a large river which he designated Port Nelson, "from the name of the master of his ship, whom he buried there."

Port Nelson River, or as now termed Nelson River, is the outlet through which drains the whole of the rivers and lakes included within the basin of Lake Winnipeg, extending from the Rocky Mountains on the west to within one hundred miles of the shores of Lake Superior on the east, and covering a drainage area of about 360,000 square miles.

Port Nelson is about eighty miles nearer to Liverpool, *via* Hudson's Straits, than is New York. It is at the mouth of a river of the first class, carrying a body of water double that of the north and south branches of the Saskatchewan combined, and it reaches the sea through a narrow depression in the Laurentides, having a descent of about twenty inches in a mile, or, in round numbers, seven hun-

dred feet in a little more than four hundred statute miles from the spot where it debouches from Lake Winnipeg.

Port Nelson, moreover, is about the same distance from the edge of a vast fertile region in the North-West, exceeding two hundred millions of acres in area, as Quebec is from Toronto.

For more than two hundred years, from two to five sailing vessels, on an average, frequently with war ships conveying them, have sailed annually from Europe and America to Port Nelson, or other ports in Hudson's Bay, and returned with cargoes the same season, *viâ* the only available route, Hudson's Straits.

In view of the growing interests of the North-West, from whatever point these may be regarded, the time for enquiry has arrived, whether communication with the Atlantic Ocean, with Port Nelson as a starting point, may not be made safe, speedy, and economical. The enquiry has become a natural consequence of the extended knowledge now made public respecting the vast area in the North-West, suitable for grain-growing and for pasturage, which the Government surveys have supplied. It is also encouraged by the great changes which have taken place during the last ten years, in the prosecution of the sealing industry, which have established the fact that properly constructed vessels of large capacity are, in skillful hands, perfectly adapted to push their way through ice-encumbered seas. It has been pressed forward by the new industry, so rapidly rising into importance, which gives additional wealth to the prairies of the west and southwest in the United States, by the European demand for their live products as well as for their grain.

The establishment of a cheap and speedy means of communication between the North-West and the open Atlantic, *viâ* Hudson's Straits, would not only secure the rapid settlement of Manitoba, but open to successful immigration a fertile

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area twenty times as large as that province. The proximity of this vast extent of country to its own seal card would, under such circumstances, also secure the carrying trade of its own productions under one and the same flag.

The following abstract reviews in succession the leading points in this enquiry, namely:—

- I. The geography of Hudson's Straits.
- II. The character of the navigation in Hudson's Straits.
- III. The ice in Hudson's Straits and Bay and on the Labrador.
- IV. Nelson River.
- V. Port Nelson as an objective point.
- VI. The natural marine resources of Hudson's Straits and Bay.

The Geography of Hudson's Straits.

Commander Beecher states that the western entrance to the Straits is not more than fifteen leagues, or forty-five miles in width; but this must include only the open water between Cape Best and Button's Islands, which are at least ten miles from the mainland of Labrador, making the entire width of the main entrance to the Straits fifty-five miles. Between Button's Islands and the mainland there is a group of eleven islands, two of which are large, and the channels between these are four in number. Cape Chidleigh or Chudleigh is represented to be on Chudleigh Island, and of the nature of the passage between this Archipelago and the coast of Labrador, no reliable information appears to be published.

Cape Best, which forms the northern limit of the main entrance to the Straits, is on Resolution Island; but between this Island and the mainland, or Terra Nivea, on the north side of the Strait, there is a wide passage represented on the chart to be about ten miles in breadth. There are,

therefore, no less than three entrances into Hudson's Straits, the first and the most northerly lying between Resolution Island and the East Bluff, styled on Captain Beecher's chart, "Gabriel Strait" (?), about ten miles in breadth; the second or the main entrance between Cape Best, forming the southern extremity of Resolution Island and the Button Islands, forty-five miles in breadth; and lastly, the several channels lying between the islands on the coast of Labrador, of which four are marked within a breadth of ten miles. It will be shown subsequently that the east entrance to the Strait once passed, the navigation is comparatively easy to the westward; and as the difficulty of effecting an entrance in the summer with sailing vessels arises from drifting floe ice, the establishment of a signal station on Resolution Island, and one on one of Button's Islands, to indicate the position of the open channels, is of the first importance in the navigation of these waters early in the season. Winds may press the floe ice on the south or north shore, according to their direction, and while the north passage may be closed by westerly winds driving the ice on to the south-easterly coast, the south or Labrador shore may be free from ice, and open water may exist early in June. On the other hand, northerly winds will drive the ice to the southern or Labrador shore, and the channels on the north side, or near Cape Best, or through Gabriel Straits, will be open. Once within the entrance the navigation becomes comparatively easy. * * *

The Character of the Navigation in the Hudson's Straits.

In 1814 Lieutenant Edward Chappell, R.N., of H. M. S. "Rosamond," visited Hudson's Bay, and in the narrative of his voyage, published in 1817, he pointedly adverts to the advisability of merchants sending a strongly-built brig into Hudson's Straits *early in the month of June*, so as to reach Cape Saddleback before the Company's ships arrive,

Hudson's Straits, Green Resolution Beecher's chart, width; the second strait, forming the entrance to the strait, and the Button strait, the several straits of Labrador, of ten miles. It is an easy entrance to the strait, being an entrance from drifting floe on Resolution to indicate the importance in the season. Winds here, according to the passage may be from the south-east may be free in June. On the north side, or the southern side, will be open. It becomes compara-

Hudson's Straits.

N., of H. M. S. the narrative fully adverts to the newly-built brig June, so as to the ships arrive,

with a view to trade with the Esquimaux of those coasts. He also states that a vessel intended for this trade should not remain later than the beginning of October in the Straits. The period included between "early in June" and the "beginning of October" within the limits of Hudson's Strait, sufficiently establishes the fact that, in the opinion of Lieutenant Chappell, as derived from practical observation in the "Rosamond," and a careful study of the subject, the navigation of the straits is safe for a strong brig for a period of about four months, or during June, July, August, and September—say from the 10th June to the 5th October, or four lunar months. If for a "strong brig" we substitute a strong steamer, and fit her with modern and really inexpensive magneto-electric lights for night work, the difficulties Lieutenant Chappell encountered would be vastly diminished and very probably an additional ten days added thereby to the season for navigation in October, making the period exceed four calendar months, for Lieutenant Chappell states that *it is not to be expected that ships* during their return to Europe from Hudson's Bay will ever meet with loose ice; that is with floe or pan ice. He is writing of the Hudson's Bay Company's ships, which are stated to start from York Factory homewards by the 20th of September, and so exact is he in his statements that ice is not to be expected to be met with by sailing vessels on their homeward voyage, that he enumerates the different kinds of work done on arrival at York Factory, close to Port Nelson, in the following words:—

"It is not to be expected that ships during their return to Europe will ever meet with loose ice; therefore as soon as our ship anchored on York Flats, we *undid* all the preparations which had been made for manœuvring while amongst the ice; such as re-stowing our anchors and putting below ice-ropes, ice-anchors, ice-axes, &c., and we rejoiced in being rid of them."

This is a most important consideration in relation to the navigation of the Hudson's Straits in the fall of the year. In fact, it reduces ice precautions to the early or summer voyages only, and besides conferring unexpected safety upon the homeward voyage, it prolongs the season of navigation, so that steamers may remain at York Factory or Port Nelson, until the new ice begins to be formed about the harbor or mouth of Nelson River. The use of the magneto-electric light, on approaching either entrance to the straits, or the establishment of land signal stations there, provided with powerful magneto-electric lights, would greatly assist in promoting safe and speedy navigation during the long nights of the fall of the year. In June and part of July, there is little or no night.

Once within the eastern entrance, the Straits are seen to expand into a broad open Bay, well-known as Ungava Bay. Green Island lies about half-way between the North or Terra Nivea shore and Akpatok Island, at the entrance to Ungava Bay, the clear sea way, on either side of Green Island, being about fifty miles in width. In traversing the Straits, Ellis says: "If I have to give any directions for avoiding the thickest of the ice in these Straits, it would be to keep pretty near the North Shore, for we always observed that side much the clearest, as not only the winds blow mostly from thence, but currents too come out of most of those large openings which are on that side. * * *

The Ice of Hudson's Bay and Straits, and on the Labrador.

The extent to which ice forms in Hudson's Bay is not known, but judging from the statements of Hearne, whose opportunities for acquiring information were excellent, ten miles from the shore may be the extreme limit in the deeper and northwesterly portions. The southern part of the bay, and the eastern portion probably freeze over a much larger area than the northwest portion, where the

a relation to the fall of the year. early or summer expected safety season of navigation. York Factory or be formed about The use of the other entrance to signal stations electric lights, speedy navigation of the year. In night.

Straits are seen to as Ungava Bay. in the North or the entrance to the side of Greenland traversing the various directions for Straits, it would for we always only the winds come out of most side. * * *

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son's Bay is not Hearne, whose excellent, ten the limit in the southern part of freeze over a tion, where the

water is not only deep, but there are excellent reasons for supposing that a warm under-current comes to the surface there, forming a polynia, as in some parts of the extreme north, such as at the entrance to Smith's Sound, also in Bellot's Straits, in the Spitzbergen Seas, and on the west coast of Behring's Straits. The cause of these polynias will be found in any of the recent Arctic explorations by sea.

Hearne states that in the northern part of Hudson's Bay and Straits, "the sea is frozen over several miles from the shore." He is referring to a statement of the ornithologist Pennant, who, when describing the habits of the Black Gullems, or Sea Pigeons, remarks that these birds, "brave the coldest winters in those parts by keeping at the edge of the ice in the open water." This passage, as illustrating a physical phenomenon of great importance in the navigation of Hudson's Bay in the early summer months, is of especial interest, and may be cited at length. "Black Gullems, are known in Hudson's Bay by the name of Sea Pigeon. Those birds frequent the shores of Hudson's Bay and Straits in considerable numbers, but more particularly the northern parts, where they fly in large flocks; to the southward they are only seen in pairs. * * * My friend, Mr. Pennant, says they brave the coldest winters in those parts, by keeping at the edge of the ice, near the open water; but as the sea at that season is frozen over several miles from the shore, I believe no one's curiosity ever tempted him to confirm the truth of this, and it is well known they never make their appearance near the land after the frost becomes severe." Hearne had so many opportunities at the Prince of Wales Fort, near the mouth of Churchill River, of making observations upon the ice in the northwestern part of Hudson's Bay, that his statement respecting the distance it is formed from the coast line, may be accepted without fear of exaggeration one way or the other.



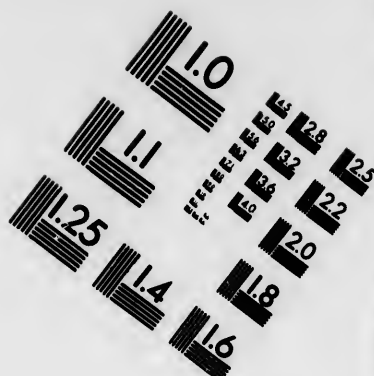
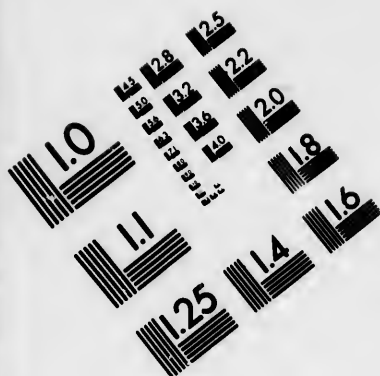
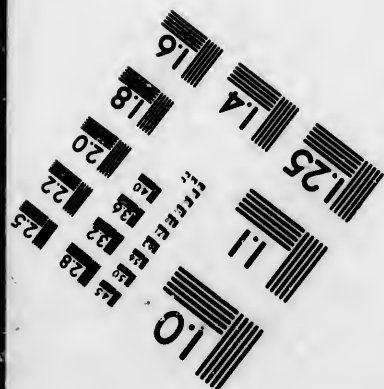
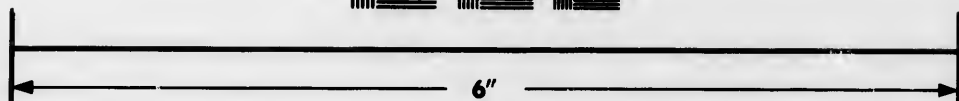
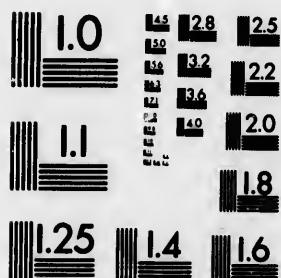


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The objective point in Hudson's Straits, it is desirable to attain at the earliest possible date in the summer, is North Bluff, in the rear of the Upper Savage Islands, from which place, as already stated, the Hudson's Bay Company's ships generally take their departure across the Straits into Hudson's Bay. Baffin anchored here, in 1615. On Parry's Chart, the Savage Islands are represented as a small group, eleven in number, protecting the entrance to North Bay, a deep opening in their rear. In his work is a sketch of the largest island, which he examined and described, in 1821. The cliffs of the eastern island rise between four and five hundred feet above the sea, and the highest portion to which Parry ascended, is from six to eight hundred feet above the ocean, hence the group is a conspicuous object, and affords anchorage ground. Here, Parry took his observations on the tides, which shewed them to rise, neaps about thirty feet, as stated elsewhere. North Bay, in the rear, was entirely free from ice.

The great rise and fall of the tides in such a narrow strait, give color to the statement that ice never forms entirely across it, for it is well known that no agent is so powerful in preventing the formation of ice in northern latitudes as strong and continual tidal currents. Hence the suggestion of Lieutenants Chappell and Robson, that Hudson's Straits should be entered early in June, before the ice breaks up in the Bay and is carried into the Straits, acquires special importance in connection with the shelter afforded by the Savage Islands and North Bay. Here, if necessary, steamers might wait for the disruption of the ice in Hudson's Bay, supposing that open water does not exist throughout the winter or in the early spring between Mansfield and the adjacent large island thirty miles distant. It is, however, extremely improbable that at this entrance to Hudson's Bay, where the water is deep, ice forms a continuous barrier at any period. The statement of Hearne that in the northern

it is desirable to summer, is North lands, from which Company's ships traits into Hudson's Bay. On Parry's a small group, to North Bay, is a sketch of and described, in between four the highest portion hundred feet conspicuous object, took his observation to rise, neaps North Bay, in the

such a narrow never forms even no agent is so ice in northern parts. Hence the reason, that Hudson's Bay, before the ice Straits, acquires shelter afforded there, if necessary, ice in Hudson's Bay exist throughout Mansfield and the It is, however, to Hudson's Bay, a continuous barrier at in the northern

parts ice forms only "several miles" from the shore is entirely opposed to this view, and conjointly with the great range of the tides it may reasonably be supposed Captain James alleges that where he wintered, in the southern part of James Bay, ice was formed as far as the eye could see. This is very probable, for James Bay, though much farther to the south, is very shallow, and its waters for miles from the shore are brackish only. * * *

Danger Arising from Ice.

Sir Edward Parry states that "the effects to be apprehended from exposure to the swell of the main ocean constitute the peculiar danger of first entering the ice about the mouth of the Hudson's Straits, which is completely open to the influence of the whole Atlantic. A very considerable quantity of loose ice is sufficient to shelter a ship from the sea, provided it be closely packed; but when the masses are separated by wind and tide, so as to admit the swell, the concussion soon become too violent for a ship, strengthened in the ordinary way, to withstand for any length of time. On this account it is prudent not to enter the ice without a fair prospect of getting seven or eight leagues within the margin. For the same reason also, when likely to be beset near the sea, it is better to make a ship fast to small rather than to large pieces, in order to avoid the heavier concussions occasioned by the latter.

The Newfoundland, the Dundee, and the Norwegian sealing steamers being properly protected, push their way into the apparently illimitable fields of ice in March and April in pursuit of seals, seeking the ice, for it is there only that they can capture the seals. There are now five and twenty sealing steamers of large size in Newfoundland waters, and during the past ten years they have nearly driven the sealing craft from this, formerly-styled, hazardous enterprise. It is not unreasonable to suppose that at the present

day, when ice navigation is so thoroughly understood, not only by the captains of sealing vessels but by steam whalers, that the passage through Hudson's Strait, successfully accomplished for 200 years by bulky and unwieldy sailing vessels and vessels of war, should now become an easy problem. Two and often three Hudson's Bay ships have for a period of nearly two centuries annually passed through Hudson's Straits and Bay, and for a considerable part of the time they were conveyed by the cumbrous men of war of old times. Numerous whaling vessels have also traversed these waters, and it is announced that this year an American house is about to send again a whaler to that well-known ground north of Charchill, Marble Island, and the coast towards Rowe's Welcome, to seek for the reported remains of Sir John Franklin. The French not unfrequently sent vessels of war into Hudson's Bay, and once they destroyed the forts. All these facts show that old-fashioned sailing craft successfully accomplished for nearly two centuries, for the purposes of a limited trade, a supposed obstructed and hazardous navigation which the interests of a country as large as the empire of Germany now invite us to encounter with the modern protected steamer, the magneto-electric light, and the experience of trained and skilled men. * * * *

It is doubtful whether the northern portion of the Bay ever freezes more than "several miles" from the shore, and it remains to be seen whether much or indeed any ice does come out of Hudson's Bay. It is probable that the ice spoken of as coming from the Bay really comes down Fox Channel, as shown by the drift of H. M. S. "Terror," represented on the accompanying Admiralty chart. There are two reasons for supposing that very little ice comes from Hudson's Bay; the first is, it would imply the constant occurrence of strong southerly winds and a considerable space of time to carry the ice from so large a surface as Hudson's Bay through the confined channels leading into Hudson's Straits, and experience

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teaches that ice is rarely met with after passing Charles Island, except towards the centre of the Bay. Moreover, from the description of the ice met in Hudson's Straits, it is largely composed of hummocky or heavy arctic ice, which comes down Fox Channel from the north. It is more probable that the Hudson's Bay ice melts and disappears within the limits of the Bay itself. The second reason is, that the early opening of the ice on the west coast of the Bay, admitting the salmon and caplin to the shores in the latter part of June, even so far north as Churchill, and six weeks before the Northern Labrador is free from coast ice, appears to show that local dissolution is the chief if not the only cause of the disappearance of the Bay ice, and its remnant is occasionally found in the eddy near the centre of the Bay in July. If the Bay ice found its way into Hudson's Straits, these would be most liable to be blocked up between Mansfield and Digges Islands, but this part is represented to be always clear. * *

CHAPTER XXXII.

The Past, Present, and Future of our Railway Systems.

Palliser's Expedition—His Report on the Country and Mountain Passes—Canada acquires the Hudson's Bay Company's Territories—British Columbia unites with the Dominion—Sandford Fleming appointed Chief Engineer—Yellow Head Pass—Trip of the Chief Engineer—My trip to Peace River—"Ocean to Ocean" published—My report on the Flora and Climate—Continuation of the Surveys—My second Report—Called before a Committee of the House—My third Report considered Extravagant—Surveys draw to a Close—Diverse Opinions regarding the Country—My views regarding Peace River Confirmed—Exploration of the Buffalo Plains—Sir Charles Tupper Endorses my Statements—A General Awakening as to the Value of the Country—Railway Communication Effected with Winnipeg—Formation of the "Syndicate"—Review of the Surveys and their Results—Construction of the Lake Superior Branch—Lines Surveyed—Cost of Surveys—Increased value of the Country—"Syndicate" carry the Road South—Brandon Located—Lines Located by the "Syndicate"—Lines in Operation—South Western Colonization Railway Company—A net work of Railways Contemplated—Only Two Outlets Calculated at Present—The Future Traffic—The Nelson River Route—The Churchill and Saskatchewan Route—Prince Albert and Peace River—The Great City of the Future.

HER Majesty's Government being anxious to obtain correct information with respect to the facilities or difficulties of communication between the Canadas and the country west of Lake Superior, and north of the 49th parallel, sent out an expedition under the command of Captain Palliser in the summer of 1857, to explore the interior and see if any means could be adopted to shorten the route to it, or if there were any practicable passes in the Rocky Mountains by which horses could cross to British Columbia. After spending the summers of 1857, 1858, and 1859 in exploring the country, he reported on his mission. His conclusions regarding the passes through the mountains, were *as accurate* as his conclusions regarding the lands. On page sixteen of his report is this paragraph: "The connection therefore of the Saskatchewan plains, east of the Rocky Mountains, with a known route through British Columbia, has been effected by the ex-

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pedition under my command, without our having been under the necessity of passing through any portion of the United States Territory. Still the knowledge of the country on the whole would *never* lead me to advocate a line of communication from Canada, across the continent to the Pacific, exclusively through British Territory. The time has now *forever gone by* for effecting such an object, and the unfortunate choice of an astronomical boundary line has completely isolated the Central American possessions of Great Britain from Canada in the east, and also almost debarred them from any eligible access from the Pacific coast on the west."

The years came and went. Canada acquired control of the interior, united with British Columbia, and as a part of the contract agreed to build a railroad through the mountain barrier declared by Palliser impassable. Parties were organized in the month of June, 1871, for the purpose of making an instrumental survey and gathering that knowledge of the vast tract of little known country extending from Ottawa to the Pacific, that would enable our engineers to locate a railway line that would combine directness with an easy grade from west to east.

Mr. Sandford Fleming, was appointed Chief Engineer, and with characteristic energy, he set to work. Parties were at once organized and the first detachment left by the River Ottawa for the interior on the 10th June. Those for the region north of Lake Superior left Collingwood on the 20th June. In the west, a portion of the staff left Victoria for the mountains the very day that British Columbia entered the Union, July 20th, 1871. Besides examining the country generally, two of the Rocky Mountain Passes were to be carefully explored; the Yellow Head Pass entering the Mountains by the Athabasca River and Howe's Pass, which is the source of the North Saskatchewan.

The discovery of a practicable and very favorable route from the summit of the Rocky Mountains to Kamloops, in

the interior of British Columbia, *via* the Yellow Head Pass and Tête Jaune Cache, caused the further examination of House Pass to be abandoned, as it had been ascertained that the approaches, on the west side, were of a very difficult nature. The year 1871 closed with the knowledge that no insuperable barrier prevented the union of British Columbia with the east, by an iron road. The magnitude of the undertaking now became apparent, and the insanity of building a road for 2,730 miles, through a hitherto almost wholly unknown region, was laughed at in the United States, and the project was looked upon as chimerical by the people of the Mother country.

Early in the summer of 1872, the Chief Engineer decided on crossing the continent himself, so that he might form some idea of the general character of the country through which the railroad was to pass. The Rev. G. M. Grant, M.A., of Halifax, Nova Scotia (now Principal of Queen's College, Kingston, Ontario), accompanied him as Secretary, or rather took that title in his admirable work, "Ocean to Ocean," which gave an account of the trip. I had the good fortune to be attached to the party as botanist, and by a mere accident became an actor in the development of the North-West. On our arrival at Edmonton the party separated, and Mr. Charles Horetzki and myself were sent to explore the country bordering on the Great Peace River, examine its Pass, and reach the Pacific Coast by the best means in our power.

Learning all we could about the country, at Edmonton, we started for Peace River, and reached it after infinite difficulty, on October 1st, near the mouth of Smoky River. Another month of hardship found us west of the Rocky Mountains, and instead of one Pass, we had found two—the Peace River and Pine River Pass.

On his return the Rev. G. M. Grant published his work—"Ocean to Ocean,"—and at once the eyes of the reading

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public were turned to this wonderful country which he de-
 scribed in such glowing terms. My report of what I saw was
 published in 1874, and as I frequently stated what I believed
 my report was much criticised, my statements and con-
 clusions being at variance with popular opinion. In that
 report I showed from the flora that the summer climate of
 Peace River in lat. 56° north, was almost equal to, if not
 better than, that of Belleville, Ontario, in lat. 44°.

Two years more passed away, line after line had been sur-
 veyed, and knowledge had spread regarding the country. I
 had been in British Columbia, had seen the Peace River
 country in summer, and had gone down the mighty stream
 to Lake Athabasca. Again, I reported on the country and
 this time stronger than ever, showing at the same time the
 products of the soil in testimony of my statements. In the
 spring of 1876 I was called before a committee of the
 Dominion Parliament to give evidence as to the character of
 the country between Winnipeg and the Pacific, and although
 held up to ridicule by some of the members for my extrava-
 gant statements, Mr. James Trow, chairman of the committee,
 endorsed the greater part of my *extravagancies* and next year
 crossed the country to the Saskatchewan and saw for himself.

By the year 1877, the surveys were apparently drawing
 to a close, and this year I was invited to write a report on
 the whole country for the information of the Minister of
 Public Works, and cautioned in plain words not to draw on
 my *imagination*. In response to this I wrote as much *truth*
 about the country as I dared for I saw that even yet my
 best friends believed me rather wild on the "illimitable
 possibilities" of the country. When summing up the various
 areas I reached the enormous figures 200,000,000 acres, I
 recoiled from their publication on the ground that their
 very immensity would deny me that amount of credence I
 desired, so as a salve to my conscience I kept to the large
 number of 200,000,000 acres but said that there were

79,920,000 acres of arable land, and 120,400,000 acres of pastures, swamps, and lakes.

At this time politics engrossed the minds of the people, the surveys seemed endless, the expense was enormous, the construction of the Lake Superior Branch was found to be a slow and extremely costly undertaking, and many members of the house and at least one leader became so conservative that he considered British Columbia was bought at too high a price. My statements were looked upon as those of an honest but crack-brained enthusiast and little attention was paid to them. The country was declared to be largely an irreclaimable waste. Where not too arid for the growth of grain there would be extreme danger from frost, and the severity of the winter and periodical visitations from grasshoppers were brought in to do duty in aid of the speaker, who might oppose me.

A change of ministry took place and Sir Charles Tupper at once called for a report on the state of our knowledge of the country. It was seen to be extremely limited and as my statements regarding the Peace River and the north generally lacked corroboration, a number of parties were sent north of the Saskatchewan and Doctor George M. Dawson, Assistant Director of the Geological Survey was instructed to report on the Peace River region. I was sent to the prairie region with instructions to examine the Great Buffalo Plains, lying between the Qu'Appelle and the Rocky Mountains. During the summer myself and assistant travelled over 3,000 miles in making traverses through this immense wilderness. Instead of it being an arid desert, as Palliser had described it, we found it covered with tall rich grass, with often a scarcity of water on the surface, and for hundreds of miles an almost total absence of wood. Very little observation was necessary to correct Palliser's mistake, which at best was a hasty conclusion come to by the absence of trees and scarcity of water.

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On my return to Winnipeg I announced the discoveries I had made, and in the presence of nearly one thousand of her citizens with the Chief Justice of Manitoba as chairman, fearlessly announced that the so called arid country was one of unsurpassed fertility and that it was literally the garden of the country. I then called attention to the Qu'Appelle country and showed that at least 12,000,000 acres of farming lands were in one solid block on both sides of the river. During the winter of 1879 all our reports were laid before the Government, and Dr. Dawson more than confirmed my former report of the Peace River country. Sir Charles Tupper, as Minister of Railways, formally acknowledged his belief in my statements, and in his great speech on the Pacific Railway in the spring of 1880 accepted my figures as the basis of his calculations, but not before he had satisfied himself that my statements were not the guesses of an ill-informed enthusiast. A number of gentlemen had taken up the Railway Route by Pine Pass in preference to that by the Yellow Head Pass, and considered it their duty to belittle my statements, and in one or two instances to make counter ones. In my report of this year I classified the lands on the basis of all the knowledge hitherto obtained, and showed that there were 150,000,000 acres suitable for pastures and wheat culture.

The country was now thoroughly aroused. Americans for some years had cast longing eyes to the north, and the citizens of Minneapolis and St. Paul had pushed a railway up through Minnesota to the boundary, while our own people completed the Pembina Branch, and in the spring of 1879 Railway communication with the east was opened up to Winnipeg. In the fall of that year Manitoba wheat reached Minneapolis and St. Paul and at once throughout the length and breadth of the Union, the "New North-West" was proclaimed as the Eldorado from which the supply of wheat for the manufacture of fine flour was to come. With the

eye of prescience the directors of the St. Paul and Manitoba Road saw that the country, which Consul Taylor of Winnipeg and many others, had pronounced the wheat garden of the world, was about to become so in reality. Without any delay they set to work and consolidated their lines and as soon as the announcement was made by the Government that they were going to ask for tenders for the building of the whole road they were at the front with their offer. It is needless to say that owing to political necessity or a state of chronic obliviousness the discussions on the Pacific Railway resolutions brought out the fact that a large section of the House of Commons doubted, or affected to doubt, my carefully compiled report on the extent and fertility of the country.

As a proof of this I may state that in an interview I had with the Premier in May, 1880, he said, "Mr. Macoun, I think you are very enthusiastic regarding the country." I said, "It may be so, Sir John, but my enthusiasm is bred of belief." Both Mr. Mackenzie and Mr. Blake had showed that the country was of little value in their speeches during the session just closed. Sir John, I could see, scarcely allowed himself to accept as fact that which was so ardently to be desired, but Sir Charles Tupper entertained no doubts, but encouraged me to do my duty and stick to what I conceived to be the truth.

During the summer of 1880 I was sent still farther south, and again I returned with increased faith in the value and fertility of the country. In the meantime negotiations had been opened with the "Syndicate" for the construction of the road, and the parties entered into the arrangement with every element in favor of the "Syndicate" making a good bargain. Our own people had done their best to show that the road would never pay running expenses when built, and that the country through which it would pass was in many places a howling wilderness and would remain so. With

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these weapons in their hands, and in addition, with a knowl-
edge of the country, which when laid before them, one sec-
tion of our people had persistently rejected and refused to
believe, the "Syndicate" entered the fight.

Instead of being astonished at the liberal terms granted
the "Syndicate," we ought to feel the country came off well,
when we realize the amount of ignorance and misrepresenta-
tion, which combined to strengthen their hands when they
asked for the terms of the contract. By its terms they got
certain parts of the road which are now completed, and other
sections, now under contract, when completed, 25,000,000
acres of land and \$25,000,000 in cash. They agree to com-
plete and operate the road between Ottawa and the Pacific
within ten years, and afterwards operate it for ten years
longer under forfeiture of their charter. Thus after almost
ten years of constant anxiety to the Government, the great
undertaking passed from their control to that of a Syndicate,
consisting of men of known financial ability and business
habits.

So that the magnitude of the undertaking may be properly
estimated, we will give a review of what had been done
during the continuance of the surveys from their inception
to the close of 1879. In June, 1871, the country was still
in the state it had been in for ages. Annual fires crossed
the plains, periodical quarrels occurred amongst the Indian
tribes, the buffalo came and went, and the long cold winter
passed away, and was succeeded by the genial warmth of
spring. In 1873 the Boundary Commission commenced
operations at the Lake of the Woods, and in the two succeed-
ing years continued their work west to the Rocky Moun-
tains. Early in 1874 the Mounted Police were organized
and sent out, and law and order at once reigned on the plains.

The first money appropriated for the survey of the Cana-
dian Pacific Railway was in the session of 1871. Callander
Station, close to Nipissing, was the initial point fixed upon.

From this point the line was projected to go north of Lake Superior, and from thence passing the Lake of the Woods reach Red River at Selkirk. As soon as the state of the surveys permitted, work was commenced at the eastern end of the Lake Superior branch, and immediately afterwards at Selkirk the western end. Owing to the morasses, lakes, rivers, and generally rocky character of the country immense sums were sunk in the works and apparently little progress was made, but in the end the eastern and western sections were completed, and during the coming summer the whole line from Thunder Bay on Lake Superior to Selkirk, a distance of 410 miles will be completed, and before the end of the present season immigrants will travel all the way to Winnipeg on our own highway.

West of Winnipeg on the prairie section the line was projected to cross the Narrows of Lake Manitoba, pass through the low country along the base of Duck Mountain, up the valley of Swan River, and westward from Livingstone (Swan River Barracks) to the elbow of the North Saskatchewan, and from thence westward to Battleford, Hay Lakes (Edmonton), and so on to the Rocky Mountains at Jasper's House. Between Thunder Bay and Tête Jaune Cache the actual measured distance is 1,452 miles or over 1,000 miles west of Winnipeg. In the spring of 1879 other surveys were made of the country south of Lake Manitoba for the purpose of running the line south of the Riding and Duck Mountains, and therefore through a region better suited for settlement. Two summers were spent on these surveys, and the line definitely located for two hundred miles and one hundred of this placed under construction.

West of the Rocky Mountains the surveys were carried on year after year for nine successive summers, and eventually that known as the Burrard Inlet Route was adopted. This line passes from Port Moody to Yale and thence by the valleys of the Fraser and Thompson Rivers to Kamloops,

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and thence to Tête Jaune Cache at the summit of the Rocky Mountains. In the spring of 1880, 127 miles of this section was placed under contract, and up to the present considerable progress has been made.

By the route above given the distance from Lake Nipissing to Burrard Inlet is 2,500 miles. In surveying the various lines 12,000 miles were actually chained, and over 40,000 miles of lines examined at a cost to the country of not less than \$3,000,000. The various reports form a small library in themselves, and the surveys although costing so much leave a country which was purchased for \$1,500,000 in 1869, worth at least \$250,000,000 in 1881. Had the Canadian Pacific Railway never been mooted very little improvement would have taken place, and to-day no American Railway would be near the frontier.

The bargain with the "Syndicate" was scarcely concluded, when they showed their determination to carry the road still farther south. Acting on my report of the preceding year, they sent Engineers south of the Assiniboine, and examined the country westward. Brandon was located, and their examination of the country was so satisfactory, that they sent engineers into the Rocky Mountains to examine the Bow River Pass, or as it is called in the reports, the Kicking Horse Pass. These engineers have reported, and it is believed that the road may be carried through the mountains at that point. At present, the road is located from Winnipeg to Moose Jaw Creek, a distance of 404 miles. From this point they can go west to Calgary, or turn to the northwest in the direction of Battleford.

A branch extends southwesterly from Winnipeg, passing to the vicinity of Turtle Mountain, and thence westward to the Souris coal fields. This line is located 220 miles, and construction is far advanced on eighty-nine miles. From Brandon, another branch leads out southwesterly, for a distance of 195 miles. In all, since the Company got posses-

sion, on the first of May, 1881, they have located 819 miles, constructed about 300 miles, and have regular trains on 161 miles. During the coming summer, they are going to push on the work still more rapidly, so that by the fall of 1883, they may reach the base of the Rocky Mountains.

As soon as the Syndicate obtained control, last spring, they set to work with an energy which astonished many, and before winter, had regular trains running from Winnipeg to Brandon, a distance of 145 miles. This place had no existence last spring, and, at present, has a population of over 1,000. Churches have been built, schools have been organized, and all the machinery of civilization has been put in force in the comparatively short space of six months. Grading has been pushed on with great vigor beyond Brandon, and it is confidently expected that the line will be opened to Qu'Appelle by the first of June, which point is at least 200 miles west of Brandon, and in the heart of a rich cultivated region.

With the opening of the Lake Superior Branch, and only that part of their lines which are graded, this one Company will have, before the end of next summer, not less than 1,000 miles of railway in operation in the Canadian North-West. These lines are built in the very best manner, the ties are nearly all larch (tamarac), the rails are all steel of the best quality, and furnished with fish plates, bolts, and spikes of superior make.

For some years, the South Western Railway Company has held a charter, to build a road from Winnipeg to the Souris coal field, southwest of Manitoba. Acting on their charter, they built or assisted to build the magnificent Louisa iron bridge, across the Red River, within the limits of the city of Winnipeg. Over this bridge, the whole railway traffic, both east and west, passes. It may be mentioned here, that Winnipeg is on the left or west bank of the Red River, and that St. Boniface is exactly opposite, on the east

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or right bank. Owing to financial difficulties, the road made little progress until last summer, when it passed under a new management, and this, with the aid of unlimited cash, has pushed the grading of the road rapidly to the south.

Last spring, another railway was projected to run from Portage la Prairie to the western boundary of Manitoba. It was named the Westbourne and Rocky Mountain Railway, and is intended to pass by Westbourne, Gladstone, Odanah, and westward to Prince Albert, on the Saskatchewan. Part of this line has been placed under construction, and as the whole line for 600 miles has been projected through a rich and, to my knowledge, fertile country, there can be no doubt of its ultimate success.

In view of future possibilities, a charter was obtained, two years since, to run a railway from Hudson's Bay to Lake Winnipeg. This road is called the Nelson River Railway, and explorations carried on last summer, show that the road can be easily built. This is not the only projected road, as numerous others are chartered or will be chartered this winter, and with the branch lines that the Syndicate are permitted to build under their charter, the country will be filled with a complete network of roads.

At present, there are only two outlets in contemplation: one to the south leading to St. Paul, 480 miles distant from Winnipeg; the other to the east, which will be completed during the present year, leading to Prince Arthur's Landing, 430 miles from Winnipeg. A charter was granted last year by the Local Legislature of Manitoba, to a company to build a road called the Winnipeg and South Eastern Railway. The termini of this road are Winnipeg and Duluth. As this road was altogether in the interests of the Americans, and intended to draw the trade of our North-West to Chicago and New York, it was very properly disallowed by the Governor in Council. Sooner or later this road will be built, and not it alone, but others not yet thought of. If

the trade of the interior is going to require so many branch lines to fulfill its requirements, it follows, as a matter of course, that two roads are not enough to carry the products of the interior to eastern markets. There being no wood nor very great manufacturing facilities in the North-West, the western bound freight will be very nearly equal to that going east, for many years to come. All manufactured articles having to be brought into the country, would it not be well for the people of Ontario to awake to this fact, and make preparations to supply them? Ten years will not elapse when the wheat, barley, and oats of the West, will come pouring into this Province, and whether prepared or unprepared, the farmers must take the consequences. Tariff or no tariff, manufactured articles must be sent West, and the sooner the Ontario people wake up to the fact that their supremacy, as a farming people, is in danger of passing away, the better it will be for them. While there is time, then put more money in factories and other industries, and be prepared to reap the golden harvest which is already at your doors!

The northern outlet, at present, engages the attention of many far-seeing men, but, up to the present time, nothing certain is known regarding the navigation of Hudson's Bay. Dr. Robert Bell, of the Geological Survey, in his coming report, is expected to throw considerable light on the subject, but the report not being published, it is not available at present. In the preceding chapter will be found the latest published notices of the navigation, and other matters pertaining to that great inland sea. Two years since, a charter was obtained from the Dominion Government, for the purpose of connecting the navigable waters of Hudson's Bay with those of Lake Winnipeg, by a railway up the valley of the Nelson River. Careful examination has shown that the route is practicable, but the harbor of Port Nelson, at the mouth of the Nelson River, is far from being

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as good as reported. The promoters of the route are still sanguine of its ultimate success, but later explorations point to the Churchill as the real outlet of the interior plains.

In view of the adoption of the Churchill route, a charter has been obtained to run a railway from the mouth of that river to some point on the Saskatchewan. From various articles which have appeared from time to time, in our leading papers, it seems that the intention is to strike the Saskatchewan at some point east of Cumberland House. Should this be attempted, it will result in failure, as east of that point, the country is very low on both sides of the river for many miles. The true route is to ascend the right bank of the Churchill to the mouth of the Little Churchill, and then strike southwest almost in a straight line to Fort à la Corne. From information I have picked up from various sources, there will be no difficulty in finding a suitable route, as there is a tract of rather sandy country which stretches almost continuously from near Fort à la Corne to the southern bend of the Churchill, on the 100th Meridian. The proposed line would keep north of the chain of lakes which form the Burntwood River, a tributary of the Nelson.

A short distance above Fort à la Corne, there is an excellent crossing of the Saskatchewan, to which many lines will converge in the future, as no attempt will be made to bridge the South Saskatchewan nearer than the Moose Woods, one hundred miles to the south. All roads intended to pass to the northwest or north of the Saskatchewan, must start from this point. This being the case, and I speak from a full knowledge of the subject, the future distributing centre of the North-west, will be located below the Forks of the Saskatchewan, close to or above Fort à la Corne. Granting the successful navigation of Hudson's Bay, of which there can be no reasonable doubt, it follows, as a natural consequence, that the mouth of the Churchill

will be selected as the terminus for the railway which will shortly follow. My other point, below the Forks of the Saskatchewan, of necessity must be the next objective as here the country is high and dry, and there is a good crossing of the main river. Many parties, who have only a partial idea of the subject, point to Prince Albert as the real objective point for the terminus on the Saskatchewan, but its claims for this distinction pass away, when the subject is only partially understood. Prince Albert, being on the North Saskatchewan, is cut off from all participation in the eastern or southern railway traffic and the trade of the South Saskatchewan. The more that is known of the country, the greater will appear the engineering difficulties in regard to river crossings west of the 106th Meridian, and fewer will be the points selected by practical men for that purpose.

In conclusion, I desire to call the attention of thinking men to the prospective future of our interior Plains. Skepticism regarding the capabilities of the country has nearly passed away, and the future lines of trade are being studied and examined with a critical eye. Englishmen are awaking to an appreciation of the evident future of our country, and it were well that amongst other less momentous matters, the value of the North-west, as a store-house for meat and grain, obtain greater consideration. In case of a war between England and Russia, it is scarcely a remote possibility that the United States might be tempted to stop the supply of England with food, and in that event, two years would scarcely be necessary to bring the people of the islands to the verge of starvation. Such a contingency could not happen were the Hudson's Bay proved to be navigable, as the whole of the resources of our vast interior would be at the disposal of Britain, and cattle and grain under convoy could be carried thither in a very few days. This is only a prospective matter, but there is another that is a reality, and one which, in a year or two, will attract much attention. Let any person

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take a map of North America, and look at the situation of San Francisco. By following the line of the Union Pacific Railway eastward, he will see Ogden over 900 miles east of San Francisco, and 1,000 miles farther east, Omaha, on the Missouri. Chicago is about 2,500 miles by rail from San Francisco, and five days continuous travel is necessary between the two points. This is the present short line to the east, and when the Canada Pacific is opened, we know that it will be much shorter, as it crosses the Meridians where they have less breadth. The route of the future is much shorter.

From Ogden a branch line has been built northward and has now reached Helena the capital of Montana, and is expected to reach Fort Benton during the coming year where it will intersect the Northern Pacific. Between Benton and the Canada Pacific Railway as now projected there is only about 200 miles, which in a very few years will be open for traffic. By keeping the Canada Pacific for over 100 miles to the eastward and building a branch line from near Old Wives Lakes to Fort à la Corne, direct communication will be obtained with the line leading to Hudson's Bay, and by the time a passenger or freight going east reaches Chicago either one or the other going north will be close to Hudson's Bay. The construction of the two short lines spoken of will be extremely easy as there are no water courses to cross nor hills to ascend. It is so self-evident that this is the future line of traffic that nothing further need be said in its favor except to note that this line will tap the Union Pacific, the Northern Pacific, and the Canada Pacific, and carry for a certainty all freight destined for the European market. When this line is opened our stockmen will kill their own cattle and send the meat to Europe as the northern route will be colder and the meat not subject to a high temperature in transit. The above is the main line of the future, and Saskatchewan City will be the capital of the North-west, and Fort Churchill the New Archangel of Canada.

CHAPTER XXXIII.

Advice to Immigrants both as Regards Reaching the Country and What to do when They get there.

Where Information can be Obtained—Fare to Canada—Articles Required on the Voyage—From Whom to get Information—A Government Officer at each Shipping Port—How to Label Bonded and other Goods—How to Act on Board Ship—Articles Needed for the Voyage—Household Articles to be Bought—Mechanics' Tools—Farmers Should bring no Furniture—Warm Clothing to be Brought—Routes from Quebec to Manitoba—Agent at Duluth—Agents in Manitoba—Fare from Quebec to Manitoba—Carrying Heavy Freight a Mistake—Agents' Duties—Dominion Land Offices—Correspondence with Officials—How to Address Letters—Points to be Noted—Cautions to Immigrants—No Purchase of Homestead Land Valid until Title is Obtained—All Titles or Assignments should be Registered at Ottawa—Bounty Warrants and Land Scrip—Duties of Homesteaders—Make Entry of Homestead as soon as Possible—See that no One has any Claim to the Land Selected—Titles to all Lands Purchased should be Examined into—Land Guides will Assist at Selections of Lands—How to Select Good Land—How to get Good Sweet Water—Hay and Wood Secondary to Good Soil and Water—Spring best Time to Emigrate—Good Crops Raised on Spring Ploughing—New Plan of Sowing in Spring—Old Country People should fall into the Ways of the Country—Deep Ploughing in Manitoba a Mistake—How to Bring Money and Where to Place it—Illustrations of How much can be Saved in Five Years—Success Depends on the Settler—Canadian North-west Compared with Dakota and Minnesota—Opening of Canadian Pacific Railway—Statements of Settlers Regarding Outfit—Mode of Procedure—Prices—Amount of Money Necessary Success—in Farming—Climate—Wintering Cattle, Oxen, and Horses—The Kind of Settlers Needed.

How to reach the North-west is a question constantly asked by emigrants, and one not easily answered in their own country, but very easily answered in Canada. Should the questioner live in Great Britain or Ireland the necessary information can be obtained by writing to any one of the following gentlemen, who are the accredited agents of the Dominion Government in the mother countries:—

London.—Sir A. T. GALT, G. C. M. G., &c., High Commissioner for the Dominion, 10 Victoria Chambers, London, S.W.

MR. J. COLMER, Private Secretary (same address).

Liverpool.—MR. JOHN DYKE, 25 Water street.

Glasgow.—MR. THOMAS GRAHAM, 40 Enoch Square.

Belfast.—MR. CHARLES FOY, 29 Victoria Place.

Dublin.—MR. THOMAS CONNOLLY, Northumberland House.

Reliable information having been obtained on the points desired, the next step is to purchase a ticket if possible before leaving home. Always take your ticket, if in summer, to Quebec or Montreal, not to Halifax, or St. John's, and never to any point in the United States, because should you do so you have a long railway route ahead of you. The better plan if going to Manitoba direct is to book right through, but never *go faster than your luggage*.

The greater part of the following instructions taken from recently issued publications, may be relied on for their accuracy :—

When it has been decided to go to Canada, one of the Canadian steamship lines, whose advertisements can be found in the newspapers, should be written to, so as to secure a berth. There are vessels sailing from Liverpool, London, Bristol, Glasgow, Londonderry, and Cork.

The fare from any of the places named to Quebec, depends upon the class of passage taken. The saloon fare ranges from £10 to £18; the intermediate is £8 8s.; and the ordinary steerage passage is £6 6s., but agriculturists and domestic servants have the benefit of a lower rate. This can be ascertained from the steamship offices, and they will also supply the necessary forms to be filled up; children under ten years are charged half fare, and infants under one year a nominal sum. The fares include a plentiful supply of food, and good sleeping accommodation on board.

To Manitoba *through* tickets are issued by the steamship companies. The fare from London or Liverpool to Winnipeg ranges from £9 5s. assisted steerage, to £28 the saloon passage. Passengers are advised to take advantage of these tickets.

To secure a berth in the steamer it is necessary to send a deposit of £5 for a saloon passage ; £1 for an intermediate or a steerage passage.

Twenty cubic feet of luggage are allowed to *each* saloon passenger, ten to *each* intermediate, and ten to *each* steerage.

Any information or advice as to the most useful things to take to Canada, or upon any other subject, may be obtained at the offices of the Steamship Companies, or at any of the Canadian Government offices.

Steerage passengers have to provide bedding and certain utensils for use on board, which are enumerated in the bills of the Steamship Companies. They can be purchased at the port of embarkation, or hired for the voyage, from some lines—for a few shillings—leaving bed-covering only (a rug or blanket) to be provided by the passenger.

Government agents are stationed at the principal places in Canada, and they should be enquired for on arrival. They will furnish information as to free grant and other lands open for settlement in their respective provinces and districts, farms for sale, demand for labor, rates of wages, route to travel, distances, expenses of conveyance ; receive and forward letters and remittances for settlers, and give any other information that may be required.

Persons with capital should not be in a hurry to invest their money. They can get good interest for it by depositing it in the banks, and can give themselves time to look around before settling. There is good banking accommodation in most of the towns, and letters of credit can be obtained from any of the English banks

An officer of the Canadian Government, at Liverpool, will see the emigrants on board the ocean steamers in condition to ensure their comfort and safety during the passage to America. He will render them any advice and assistance in his power.

The name and address of this officer is—

JOHN DYKE,

15, Water Street, Liverpool.

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This officer may be written to for any desired information
respecting removal to Canada.

Intending settlers in the Canadian North-west will be
met on their arrival, either at Quebec or Halifax, by a re-
gular authorized officer of the Dominion Government, who
will at once take them in charge, have their luggage properly
looked after, and will see them safely on board the railway
train for the West.

Settlers effects, in use, will be passed free through the
Custom House, and any necessary bonding arrangements
will be made which will thus prevent any delay, inconve-
nience, or loss occurring. Each passenger, before his de-
parture from the port in Great Britain, should be provided
with address cards as follows:—

Mr.....

of.....England,

Passenger to Winnipeg, Manitoba, Canada.

.....In Bond.....

and he should see that one is pasted on each of his packages
of luggage.

As soon as the passenger gets on board he should read the
rules he is expected to obey whilst at sea. He will find
them hung up in the steerage, and should do his best to
carry them out, and to be well-behaved and keep himself
clean, as this will add much to his own comfort and health,
as also to the comfort and health of others.

If he have any grievance or real cause of complaint during
the passage, he should go and make it known at once to the
Captain. The arrangements, are, however, now so perfect
for securing comfort and speed on the great ocean steam
lines, that complaints are seldom or never heard.

All boxes and luggage should be plainly marked with the
passenger's name and the place he is going to. They will
be stowed away in the hold of the vessel, so whatever is
wanted on the voyage should be put into a trunk, carpet

bag, or small box, which the passenger will take with him into his berth.

Emigrants are often induced to make a clean sweep and part with everything they have before leaving the Old Country, because it is said the charges for extra luggage are so large that they would come to more than the things are worth. Now there are many little household necessities which when sold would not bring much, but these same things if kept would be exceedingly valuable in the new country or the bush, and prove a great comfort to the family as well. It is not, therefore, always advisable to leave them behind; they would not take up much room, and the cost of freight would be little compared to the comfort they will bring. The personal effects of emigrants are not liable to custom duty in Canada. Extra luggage (unless very bulky) is seldom charged for on the Canadian railways.

Lay in as good a stock of clothes before leaving home as you possibly can. Woollen clothing and other kinds of wearing apparel, blankets, household linen, etc., are cheaper in the United Kingdom than in Canada. The emigrant's bedding, if it is good, should be brought; and if he has an old pea jacket or great coat he should keep it by him, for he will find it most useful on board ship.

Agricultural laborers need not bring their tools with them, as these can be easily got in Canada, of the best description, and suited to the needs of the country.

Mechanics are advised to bring such tools as they have, particularly if specially adapted to their trades.

Both classes must, however, bear in mind that there is no difficulty in buying any ordinary tools in the principal towns at reasonable prices, and that it is better to have the means of purchasing what they want after reaching their destinations, than to be hampered with a heavy lot of luggage on their journey through the country. It must also be borne in mind that the tools bought in Canada will likely be specially adapted to the use of the country.

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Farmers and others with means, going out as saloon passengers, sometimes take with them the greater portion of their household furniture, bedsteads, tables, pianos, and other heavy and cumbersome articles. Nothing could be more absurd than this. The cost is very great, the articles are liable to be damaged on the voyage; and even should they reach Canada uninjured, many of them will be found to be out of place and next to useless. All heavy household furniture should be sold off; it is much better to make a clean sweep of it and to go out, so to speak, "in high marching order." Furniture of all kinds can be bought in Canada as cheaply as in England. The pianos made in Canada are second to none. Everything in the way of house furnishing is to be had at reasonable prices, and much better suited to the country than the English-made articles.

By following out the advice given above, one may go to Canada with ease and comfort. The voyage is a short one, from eight to ten days; the steamships are of the very best class, and the wants and welfare of the passengers are carefully and constantly looked after. In fact it is little else than a pleasure trip on a large scale.

It may be mentioned that there are two routes by which an intending settler can reach Manitoba from Quebec, or any other Canadian port, namely: the "all rail route," *via* Detroit, Chicago, and St. Paul to Winnipeg, or by what is called the Lake Route, that is by railway to Sarnia or Collingwood on Lake Huron, thence by steamer to Duluth on Lake Superior, and by rail from Duluth to Winnipeg. The journey by the former route is quicker by about a day, but the latter is more economical. By either of these routes the settler will be met by the agents of American land and railway companies, who will endeavor to persuade settlement in the United States as preferable to Canada; but the settler is advised to proceed direct to his intended destination, and decide upon his location after personal inspection.

In 1882, a line of railway will be completed from Thunder Bay (Lake Superior) to Winnipeg, and westward. It will pass entirely through Canadian Territory, and its benefits both to new and old settlers will be very great. It may be added that most of the rivers and lakes in Manitoba and the North-west are navigable, and that steamers now ply during the season on the River Saskatchewan, between Winnipeg and Edmonton, a distance by water of about 1,200 miles, with passengers and freight, calling at Prince Albert, Carlton, Battleford, and other places on the way. Steamers also run regularly between Winnipeg, St. Vincent, and other places on the Red River. There is also steam communication on the river Assiniboine, between Fort Ellice and Winnipeg.

At Duluth, during the season of navigation, a special agent is placed, Mr. W. C. B. Grahame. He will be in attendance on the arrival of all steamers, to assist emigrants in the bonding of their baggage, and otherwise to give them information. All emigrants should be implicitly guided by his disinterested official advice, in preference to listening to persons whom they do not know, who may have interest to deceive them.

Agents in Manitoba.

Emerson.....	J. E. Tétu.
Winnipeg.....	W. Hespeler.

These agents will give emigrants all possible information and advice.

The emigrant, or second class fare, in 1880, from Quebec to Winnipeg *via* Duluth was \$25.50, and by the rail route *via* Chicago and St. Paul, \$30.50. First-class tickets are from \$52.00 to \$59.25. Children under thirteen are taken at half price, and 150 pounds of luggage is allowed to each adult. There will probably be very little, if any, difference in the above rates, in 1882. In the case of a colony going together, the settlers might hire a railway car for the

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carriage of their effects, other than their luggage, to the point of the steamboat port, or continuously, and by this means, get a cheaper rate of freight. Many of the settlers from the older parts of Canada do this.

It is not recommended to the settler who is travelling to Manitoba, to burden himself with heavy furniture and luggage, as the freight of these would probably cost him as much as they are worth. As a rule, the emigrants should be advised not to take with them either furniture or agricultural implements. The latter particularly, specially adapted to the country, can be cheaply purchased at Emerson or Winnipeg; but a plentiful supply of clothing and bedding should be taken, together with such articles of general use as can be conveniently and easily packed. Of course, artisans who go will take their own special tools with them; but they must remember that this may be expensive if they are heavy.

The emigrants will be met at Winnipeg by Mr. Hespeler, the Government Agent, who will give them every possible information and assistance, and give them directions how to proceed to their lands; or if they take Emerson, as the point in the Province from which they start, they will find a shed at the Railway Station, and buildings at Dufferin at which they can rest, while Mr. Tétu, the Government agent, will give them information.

Dominion Lands Offices.

The following is a list of the official names of the Local Districts, together with the Post-Office address of the Local Agent :

Winnipeg.....	Winnipeg.
Gladstone.....	Gladstone.
Birtle.....	Birtle.
Dufferin.....	Nelsonville.
Turtle Mountain.....	Turtle Mountain.
Souris	Souris-Mouth.
Little Saskatchewan.....	Odanah.
Prince Albert.....	Prince Albert, N. W. T.

The Head-Offices of the Dominion Lands is at Winnipeg, being a branch of the Department of the Interior.

Correspondence with Officials.

Observance of the following hints for conducting correspondence with officers connected with the Department of the Interior, will save time and trouble to the official staff, facilitate the submission of applications for decision, and, consequently, tend to diminish the period in which replies may be looked for:—

I. Address no letters on official business by name to the Minister, or any one else connected with the department, as letters so personally addressed may be deemed private correspondence, and, in the possible absence of the person to whom they are directed, remain unopened till his return.

II. All letters to the Authorities at Ottawa on land matters should be addressed, in a plain hand, to

THE HON. THE MINISTER,
Department of the Interior,
OTTAWA.

Dominion Land Branch.

No stamp is required for letters directed to the official head of the Department, such communications being "free."

III. In correspondence with any of the local Officers, a letter should be addressed as follows

THE LOCAL AGENT,
Dominion Lands Office,

Three-Cent
Stamp.

.....

In this case the ordinary postage rules apply.

IV. Write in a concise and courteous manner, upon foolscap paper, on one side of the paper only, leaving a margin of at least an inch on left-hand side.

V. In the right-hand top corner of the first page write distinctly the official name of the post office to which a reply is to be addressed, together with the date of your letter. If the matter occupies more than one page, see that the pages are numbered; and be sure that your signature is legible.

VI. Never deal with more than one subject in a single communication; but write a separate letter for each.

VII. On receiving a reply, if you respond to it, do not fail to quote the reference number of the official file, which you will observe on the left-hand top corner of the first page (i. e., at the head of your letter put.....In reply to No.....)

VIII. Keep copies of all your correspondence with the Department or Local Offices.

IX. All remittances to pay for Dominion Lands should be made in lawful money of Canada, by registered letter. A Local Agent is not bound to accept any person's cheque.

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Useful Hints to Emigrants.

Strangers going to the North-west, should be extremely cautious in purchasing the abandonment of any one's homestead claim, as all assignments and transfers of the homestead right (until recommended for patent) *are absolutely invalid*, though, so far as the party assigning is concerned, such assignment may be deemed by the Dominion Lands Authorities as evidence of voluntary abandonments.

Any person, however, whose homestead has been recommended by the local Agent for letters patent (proofs of fulfilment of conditions having, of course, been filed with him) may legally convey, assign, and transfer his right and title therein. There is a book kept in the Department of the Interior for the registration, at the option of the parties interested, on payment of a fee of \$2.50, of any such assignment of legally assignable rights (proof of which must accompany the application to register), and the law holds every assignment so registered as valid against any other assignment unregistered or subsequently registered, even if previously made. Every assignment must, for the purpose of registration, be entirely unconditional.

Bounty Land Warrants, whether issued to men who have served in the North-west Mounted Police or the Militia force formerly performing duty in Manitoba, are accepted in payment of all lands for the amount they represent, viz: 160 acres; but purchasers of warrants should be careful to see that the assignment to themselves, as well as all previous assignments, are duly registered at Ottawa. It is essential to its validity that the first assignment of a warrant should be endorsed on the document itself.

Land scrip, whether that issued to Half-breed heads of families or of the kind granted to "old settlers" in the Settlement Belts, to extinguish certain claims, is of the same value as cash, to the *bearer*, in any purchase of Dominion Lands, for the amount represented on its face.

Settlers who take up homesteads are required to become actual residents and improvers of their claims, within six months from date of entry. In the case, however, of immigrants applying to the Minister of the Interior for leave to settle in a community, and showing good cause, the Governor General in Council has power to extend the period to twelve months.

It is important, in every case, to make a homestead entry as soon as possible, because no patent can issue (as a free grant) until three years *from the date of entry* have expired; and it is essential to reside on the homestead and cultivate the same *continuously*, in order that no delay may be occasioned at the expiration of the above period. Further, it is important, because, should circumstances require the settler to reside elsewhere, a continuous fulfilment of the homestead conditions for twelve months would give him the right, under a special clause of the Act, to purchase such homestead at the current price of the adjacent Government lands. The Department holds residence to have been "continuous" in the legal sense, notwithstanding the settler may have been absent from his homestead for a period not exceeding six months altogether in any one year of his occupation; cultivation must, however, have been carried on each season by himself or his representatives.

In the case, however, when a certain number of homestead settlers, embracing not less than twenty families, with a view to greater convenience in the establishment of schools, churches, &c., ask to be allowed to settle together in a hamlet or village, the Minister may vary the requirement as to residence on, but not as to the cultivation of, each separate quarter-section.

Immigrants will act wisely in making sure that the land for which they propose to enter is not already claimed in any way by a prior occupant. As a general rule, it will be found safer to take up land to which no legal or equitable claim is

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likely to be asserted, than to go into disputed possession of
a superior location. In the one case, the settler can con-
fidently proceed with his improvements; in the other, he
will be hindered by the delay and uncertainty involved in
obtaining a decision.

Purchasers of land in Manitoba and the North-west Ter-
ritories that has been already patented from the Crown,
should never pay any portion of the price agreed upon,
without first satisfying themselves, by obtaining an abstract
of title from the Registry Office for the Registration Dis-
trict in which the lands are situated, that no agreements,
mortgages, judgments, or other incumbrances are recorded
against it; also, that no arrears of taxes are due upon such
property. It should also be remembered that, as the law
attaches the greatest possible importance to priority of
registration, no delay should be allowed to intervene be-
tween the signing of the deed and seeing that it is duly
registered. A Registrar's fee, in Manitoba, for registering
an ordinary conveyance is \$2.20; he charges fifty cents for
a search, and for an abstract, according to the number of
the entries of documents affecting the property.

Persons travelling in the North-west are required to be
particularly careful to extinguish their camp-fires before
leaving them, so that the destructive consequences of a
prairie fire may be prevented. Both in Manitoba and the
Territories, legislation has provided adequate penalties for
the punishment of criminal negligence in this respect.
Should it happen, however, that a party of immigrants are
threatened by a prairie-fire approaching them, and no other
means of escape are available, the danger may be effectually
overcome by setting fire to the prairie to leeward of the
party, and moving the travellers, with their outfit, into the
ground so burnt over.

When one or more persons have reached a district where
they purpose looking for land, the better plan is to go at

once to the Agent and ask for the numbers of vacant sections in the various townships. Attached to each agency is a "Land Guide," whose duty is to take charge of strangers and show them where the vacant lands are, and give them information as to the quality of the soil, the presence of water, and any other matter about which he may be questioned.

As most people prefer to select lands for themselves, advice on this point may seem out of place, still a few hints may benefit some. The first requisite is a dry level or gently rolling surface free from brush on at least two-thirds of the lot. The next necessity is permanent and pure water. Should there be ponds on the lot an examination is absolutely necessary, to see whether the water is pure or saline. The best and simplest test is to wash with soap in the water. If it forms a suds the water is good, if curds in the dry season, the water is bad. I speak of ponds in this connection, as brooks and rivers contain *hard* water in nearly every case. Another test is the grass. Should grass in the middle of a pond be green at the latter part of September the water is permanently good, if rotted the water is unfit for use at that time.

Wood and hay lands are really secondary objects, as it is much better for a farmer to have a good wheat farm which he can at once break up and from which he can begin to make money, than to clear the land of brush and young wood, and waste time in draining. As is shown in another place any party taking a prairie lot is entitled to twenty acres of wood land. Few lots are without hay lands, as all hollows contain more or less hay.

Now, when railways are extending into the country, it is much better to come out in early spring if a crop is desired the first year. Any party reaching their land by the middle of May can have potatoes, wheat, and garden vegetables that same season. All that is necessary is to procure the land, pitch a tent, and set to work.

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Recently it has been discovered by successful experiments, that seeds sown on the prairie grass and then ploughed lightly, will yield good crops the same season. This is a most important discovery, as it shows that an immigrant arriving on his claim in the spring can begin to realize a return from his labors almost as quickly as if the land had already been cultivated and improved. The following is an account of the experiments made in this respect, and they will be found worthy the consideration of every farmer contemplating the "breaking" of new lands.

An experiment in raising grain on fresh sod has been tried in the vicinity of Big Stone Lake for the past two seasons with such marked success, that it is worthy of extensive trials. We are not informed who the first experimenter was, but at any rate, in the vicinity of Big Stone City, there are farmers so confident of success that they have put in considerable quantities of small grain in the fresh sod during the past season, and in every case, so far as we could learn, with the most beneficial result. The novelty of the operation is that the grain is first sown on the prairie grass, and then the "breaking" is done. A rather light sod is turned, and the buried grain quickly finds its way through. In a few weeks the sod is as rotten as need be, and can be kicked to pieces easily with the foot. Now for an illustration: A Mr. Daly, near Big Stone City, in the vicinity of Big Stone Lake, sowed ten acres of oats this last year. He put two bushels and a peck to the acre, and broke his land. Last fall, from ten acres he harvested 420 bushels of oats which were worth sufficient to pay for the breaking, and leave him some seventy-five dollars besides. This year he sowed forty-five acres in this way with equally good success, the yield, according to estimate, as he had not threshed when we got there, not being less than 1,000 bushels on the piece. Another gentleman near him sowed buckwheat in the latter part of May in the same way, and he has every promise of

a magnificent crop. Another tried corn, dropping a few kernels in every fourth furrow. Wheat has not been tried, but will be another year. It has been found that grain can be sowed on the prairie early and the sod rotted as readily as if sowed in June, as the growing crop shades it and but little grass starts. This is a valuable discovery and will be worth much to new beginners who, thus far, with the exception of potatoes, have not expected anything before the second year. It will be of value also to larger farmers who are obliged to go to a heavy outlay each year for breaking, for the oat crop not only pays for the labor, but leaves a good margin besides. It is an experiment certainly worth a trial.

The immigrant settling in a new country will understand the value of this discovery which will enable him to realize sufficient for his expenses the first year, and perhaps will enable him to place a sum of money aside for future use. The new settler when he arrives in the country ought to locate his farm with as little delay as possible, and then set to work to break as much land as he can for the ensuing year's seeding. If he should be in time to sow on the sod as already described, by all means let him do so, but if not he should break as much as possible for cultivation the following year. He and his family can very well camp out in tents during the summer, and in the fall there will be plenty of time to erect a warm house and stables for the winter.

It is of the greatest importance that old countrymen should fall into the methods of old settlers on the prairie. Too often they allow their prejudices to lead them into practices which the experience of practical men show to be altogether unsuitable to a prairie country.

For instance, with respect to ploughing, or as it is called, "breaking" the prairie, the method, in Manitoba, is quite different from that in an old country. The prairie is covered with a rank vegetable growth, and the question is how

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g, or as it is called, Manitoba, is quite The prairie is covered the question is how

to subdue this, and so make the land available for farming purposes. Experience has proved that the best way is to plough not deeper than *two inches*, and turn over a furrow from twelve to sixteen inches wide. This is well done during the months of June and July. It is found that the sod is effectually killed when turned over during these two months. It has happened that some farmers from older countries, in love at home with deep ploughing, have despised the methods of the country, and tried deep ploughing in Manitoba. These men have come to learn wisdom from practical disappointment, but this is an unnecessarily expensive lesson.

We have already advised intending settlers to avoid burdening themselves with an unnecessary amount of luggage. We would, however, recommend them to bring with them as much of their clothing as they conveniently can, as it packs in small compass, and saves outlay in the new land.

Be sure, however, to bring your money, or that portion of it which you will not require to use on the way, in the form of a draft or bill-of-exchange. If you lose the draft or bill, you can always have it replaced. If you bring gold, silver, or bank notes, and lose it, you will probably never recover your loss. There are four large banking institutions in Winnipeg, any one of which will be able to cash your draft or bill on your arrival. As soon as you reach Winnipeg, by placing yourself in the hands of the Government guides, you will be able to make your purchases at reasonable prices, and will be secure from any imposition in that respect.

The following figures may prove of interest to intending settlers, as showing what can be done in the Canadian North-west. Farms can be purchased at almost any price from one dollar per acre upwards, and one hundred and sixty acres can be secured as a homestead free, on payment of ten dollars entry fee. We will, however, base our cal-

culations on the Government price for pre-emptions of one dollar, and we will illustrate a term of five years occupancy :

First Year.

Expenditure of settler with family of say five, for provisions, &c., one year.....	\$250.00
One yoke of oxen.....	125.00
One cow.....	35.00
Breaking plough and harrow.....	35.00
Waggon.....	80.00
Implements, &c.....	25.00
Cook stove, &c., complete.....	25.00
Furniture.....	25.00
Tent.....	10.00
Sundries, say.....	50.00

Outlay for First Year..... \$660.00

At the end of the year, he will have a comfortable log-house, barn, &c., cattle implements, and say twenty acres of land broken, ready for seed.

Second Year.

Will realize from twenty acres—600 bushels of grain at 60c., which is a low figure.....	\$360.00
Expenditure, say.....	300.00

To the good..... \$60.00

And he will have an additional twenty acres of land broken.

Third Year.

Forty acres will give him 1,200 bushels of grain, at 60c.....	\$720.00
Will pay for land.....	\$160.00
Expenditure, including additional stock and implements..	500.00
	<hr/> 680.00

To the good..... \$60.00

And he will, with his increased stock and other facilities, be able to break at least thirty acres.

Fourth Year.

Seventy acres will give him 2,700 bushels of grain, at 60c.....	\$1,260.00
Less expenditure for further stock, implements, and other necessities.....	600.00

To the good..... \$660.00

And another thirty acres broken.

pre-emptions of one
five years occupancy :

provisions, &c.,	
.....	\$250.00
.....	125.00
.....	35.00
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.....	80.00
.....	25.00
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Fifth Year.

100 acres will give him 3,000 bushels of grain, at 60c.	\$1,800.00
Less, same expenditure as previous year	600.00
To the good	<u>\$1,200.00</u>

At the end of the fifth year, he will stand as follows :—

Cash, or its equivalent on hand	\$1,980.00
100 acres of land increased in value to at least \$5 per acre	800.00
House and barn, low appraisal	250.00
Stock, including cattle and horses	600.00
Machinery and farm implements, 50 per cent. of cost, say	200.00
Furniture, &c.	150.00
	<u>\$3,980.00</u>
Loss—outlay first year	600.00
To credit of farm	<u>\$3,320.00</u>

In these calculations, we have endeavored to be as near the truth as possible. We have increased the number of acres broken during the three years, because with an increase of stock and other facilities for breaking, the settler can break more. This has been the experience of farmers here. Then we have placed the expenditure high, while the price quoted for the grain is much lower than is paid at present by buyers. We show a profit of \$3,000, after paying for everything, in five years; but we can cite numerous cases in which settlers have cleared more than \$4,000 and \$5,000 in the same time, and in which in many instances they had not \$100 to commence with. The whole success of the new settler depends upon his economical management, perseverance, and untiring industry. If he pays more than \$1 per acre for his land, he may be sure it will rise correspondingly in value as the country progresses. The intending settler, however, must never forget that he can always obtain 160 acres of land free, from the Government, in addition to that which he purchases.

There is one point we desire to impress upon intending settlers, and that is the large yield of grain in the Canadian

North-west. From this time, no immigrant need settle at any great distance from railway communication unless he desires to do so, so that he can always be within easy reach of a steady market. We may safely place the average yield per acre, at thirty bushels of wheat after the second year, and can also safely say that grain will fetch as high prices as in Minnesota or Dakota. In the Canadian North-west, however, allowing prices to be equal, how does the settler stand, as compared with those south of the boundary line.

Average yield, per acre, in the Canadian North-west, 30 bushels,	
say at 80c.....	\$24.00
Average yield in Minnesota, 17 bushels, say at 80c	13.60

In favor of Canadian settler... \$10.40

This is a considerable difference which is borne out by facts, and when it is considered that the cost of living is less than in the United States, the difference becomes still greater. It simply resolves itself into this, that settlers in the Canadian North-west can afford to sell their grain, owing to their large returns at fully 50 per cent. lower than those in the United States, and still be as well off, or they can (prices being equal) realize the same percentage more than their neighbors south of the boundary line. The opening of the Canadian Pacific Railway to Lake Superior, next year, will give the North-west equal shipping facilities with the Western States. What more can we say for the information of those who are looking for new homes to guide them to this "Land of Promise," but a simple word in conclusion. The Canadian Pacific Railway is to be pushed forward at a rapid rate during the next few years, and will give employment to thousands of men.

A very large amount of grain and other supplies will be required to carry on the extensive public works of the Canadian North-west, and farmers will be kept busy in order to supply this home demand for years to come.

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ADVICE TO IMMIGRANTS.

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In addition to this, immigrants will be able to find plenty of work for themselves and their teams, during their spare time, so that the sooner settlers make up their minds to come here, the better it will be for themselves. The next ten years in the Canadian North-west will assuredly be a time of great progress and prosperity.

In conclusion, we submit the following evidence of settlers on certain points connected with outfit and farming :

*Statements of Actual Settlers.***Nelson Brown of High Bluff, says:—**

"In my opinion the month of September is the most favorable for settlers to come here, and in no case should they come earlier than May. Let them bring good medium-sized close-made horses with them. Have been here eight years and know the requirements pretty well."

Henry West of Clear Springs, says:—

"I have been in the country six years and have found the driest summer to give the best crops, even though there was no rain except an odd thunder-shower. New settlers should come in May and break their land till July, then, after cutting and saving plenty of hay for all the cattle, they can prepare their buildings for the winter."

James Stewart of High Bluff, says:—

"I would suggest that intending settlers in the North-west who come to settle down on prairie land should break up an acre or two around where they build, on the West, North and East and plant with maple seeds. Plant in rows four feet apart, the seeds to be planted one foot apart; they afterwards can be turned out and transplanted. I have them 12 feet high from the seed planted four years ago, and they will form a good shelter. I find, after a residence of nine years, that this North-west country is well calculated for raising the different kinds of grain sown by farmers. Market prices are very good. Wheat, 85c. to \$1.15; Oats, 50c. to 60c., and Barley, 60c."

James McEwan of Meadow Lea, says:—

"Farmers should have Canadian horses and get oxen and cows, and purchase young cattle. By doing so they will double their money every year. I am in the business and know by experience."

George Ferris of St. Agathe, says:—

"I would advise immigrants to fetch all the cash they can. They can suit themselves better by buying here about as cheap, and they will only get just what they need."

Jno. George of Nelsonville, says:—

"I consider this country the place to come to, providing any man wants to make a home and knows something of farming, that has about \$400 to \$500 to begin with."

John A. Lee of High Bluff, says:—

"Now that we have the locomotive, we shall be able to compare with anything in the Dominion, and take the lead with roots, and I defy the United States for samples of grain of all kinds. They have only the start of us in fruits, but we are progressing well in that respect. If folks would work four months in the year they might be independent in this country. I came here in 1873 with only thirty dollars in my pocket, ten of which I paid for my homestead of 160 acres. It is going on two years since I began to cultivate the place I am now living on, and have 74 acres under cultivation, with a suitable house and other fixtures, and I could get \$3,000 for one of my quarter sections. I can be found in High Bluff at any time with \$50 to back my words."

Geo. C. Hall of Portage la Prairie, says:—

"My claim is situated on the banks of the Assiniboine and we therefore enjoy direct steamboat communication with Winnipeg. The land is not flat but rolling prairie, no need of drainage, but still it is well watered by running springs. All crops look well. I planted potatoes on 1st June, and in eight weeks we had our first meal of them. I expect about 300 bushels to the acre. The climate of the country is all that can be desired. Any man who wishes to furnish a home for himself should try and locate in this country, and if he be a man of any energy he will not be long in making a comfortable and profitable home for himself and family. It was a happy day that I first landed on this soil."

D. H. Knight of Ridgeville, says:—

"I would recommend settlers to get oxen for breaking the sod. Horses cost much more to keep as they require grain. Oxen can be worked on the grass. I am more in the stock line, and I can say the country is well adapted for stock-raising. The pasturage could not be better. Abundance of hay can be had for the cutting, and with a little care cattle winter well, and come through in good condition."

James D. Stewart of Cooks Creek, says:—

"Would advise new settlers to buy oxen instead of horses as they can be fed cheaper and will do more work if well treated and fed on grass and good hay."

Joshua Appleyard of Stonewall, says:—

"I would advise any young man with good heart and \$300 to come to this country, for in five years he can be independent."

Jno. Ferguson of High Bluff, says:—

"I would advise settlers in a general way to start with oxen as they are less expensive in cost and keep the first year at a less risk than horses. I would advise them not to bring any implements with them but procure the best of all classes here, as they are especially adapted for this country."

Thos. H. Ellison of Scratching River, says:—

"Any man with a family of boys such as I have, that intends living by farming and raising his boys to farm, is only fooling away his time in other places when he can average a hundred per cent. more each year with his labor here as I have done. I have farmed in Europe, State of New York, and Ontario, and I can say this safely."

Geo. Fidsbury of High Bluff, says:—

"I would not advise any man coming out here to farm to bring any more luggage with him than he can actually help. I have sometimes weighed roots here and found them to surpass any I ever grew in Canada. I do not think there is any use telling the immigrants the weights as they will hardly believe it. It is enough for them to know that this country can produce more to the acre with less cultivation than any part of Canada."

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CHAPTER XXXIV.

Advice to Settlers and Travellers.

Protection against Sudden Storms in Winter—Thunder, Rain, or Wind Storms in Summer—How to Protect Horses and Cattle from Flies—Smudges—Keeping the Tent Clear of Mosquitoes—Care of Horses when Travelling—How to Find Lost Horses—Precautions to be Used—Where to Pitch a Camp in Summer—In Winter—How to Find Water—How to Know Sweet Water—Protection against Prairie Fires—Saving Hay and Fences—How to Travel Over the Prairie With or Without a Road—White Mud Swamps—Carelessness of Travellers as Regards their Personal Comfort—How to Prevent a Prairie Fire—Penalty for Starting One—Crossing Streams with Bridges—How to Cross, &c., &c.

OCCASIONALLY notices appear in the public prints of travellers and others who have lost their lives by being caught on an exposed prairie in a winter storm or blizzard. Should old travellers be caught in one of these storms no attempt is made to proceed to their destination, but an immediate halt is called or an effort is made to reach the nearest shelter. Should none be near, the nearest ravine or *coulée* is entered and the banks of snow made to do duty for a house. Instances have been known where Half-breeds have lain comfortably in the drifts for days and saved themselves and horses, when if they had proceeded they would have been frozen to death. In the winter of 1875 I was travelling with a company of Half-breeds when a terrible snow-storm came on accompanied with a fierce gale, which drove the icy particles into our eyes with such force that they scarcely left us the power to see. We were sixteen miles from wood, and it was decided to attempt to reach it. Failing in this, we were to make a break wind of our carts, and camp in a favorable hollow. Knowing what we intended to do we pushed on, our leader merely taking the direction of the wind *on his cheek!* Reaching the wood and penetrating it some distance we

discovered a little pond where we unharnessed our horses, built a roaring fire and thawed the ice out of our beards and hair. We now built booths of poles and willows, and thatched them over with the long grass of the pond, and for the next thirty-six hours enjoyed ourselves amazingly. A few visits to the edge of the wood showed the storm still raging on the prairie, and for two nights and a day we were snow-bound. We obtained abundance of food for our horses in the grassy glades, and scarcely gave a thought to the blizzard that swept the prairie a quarter of a mile away.

All travellers should carry matches summer and winter. These should always be placed in an inner breast pocket so as to be dry and handy. Inexperience says they are not necessary, or, we know a friend who has them. Wisdom says, carry them yourself. In winter, besides matches, dried grass, or the outer bark of the canoe birch, should always be carried so that not an instant need be lost in lighting a fire if the necessity for it should arise. In the winter of 1872 when travelling in Northern British Columbia, the weather was intensely cold and the lakes were frozen over, but in some places the rivers discharging them were covered with only a thin film of ice. We reached a small river, discharging Carrier Lake, which I crossed in safety. An old Indian following me broke through, and by the time he was out he was like an icicle. In an instant every pack was on the ground, a fire was lit and while he changed his clothes, a cup of hot tea was got ready and scarcely fifteen minutes elapsed before we were again on the way.

The cause of settlers and others losing their lives in winter can always be shown to arise from their desire to reach home or from persistently fighting the storm, until their vitality and animal heat are so far exhausted that they sink down and fall into a deep sleep and never awake. On the

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How to Find Lost Horses—
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Prairie Fires—Saving Hay
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other hand, if a man lies down and gets cold when asleep, he will surely wake up with a change of temperature. All parties caught in a severe storm should conserve their powers, instead of weakening them by persistent efforts, and this can be done by at once fleeing to shelter, and if no fire can be lighted, wrapping the body up in warm clothing, and remaining passive until the storm ceases. During the past winter, a number of individuals lost their lives by not fully recognizing the danger they ran in exposing themselves on the prairie, when a severe wind storm (Blizzard) was in progress. Owing to its force and the icy particles that fill the air, it is next to impossible to make progress, except before the wind, and too often this is in the wrong direction. It is, therefore, absolutely necessary for all parties travelling in a thinly settled part of the country, any time after the beginning of October, to carry matches with them, and if caught in a storm, to retreat at once to a thicket, and build a fire and remain there quietly until the storm is past.

Summer storms are often very severe, and frequently accompanied by terrific thunder and wind. I consider a prairie thunder storm as one of the most appalling occurrences which a traveller on the plain has to encounter, and one which he has no means to escape. There are few days in June and July, when thunder is not heard from some point of the compass. Most of the storms are merely local, and last but a short time. They generally take place after three o'clock in the afternoon, and no matter how severe the night storm may be, the air is clear and calm in the morning. Should a series of storms take place, the temperature is considerably lowered, and a cloudy and windy day will likely follow.

All travellers should have a strong cover for each wagon or cart, and see that it is securely fastened every night before retiring to his tent. Very frequently, the traveller

cold when asleep, of temperature. All could conserve their persistent efforts, to shelter, and if no up in warm clothing, ceases. During the t their lives by not in exposing them- d storm (Blizzard) d the icy particles to make progress, is is in the wrong necessary for all rt of the country, c, to carry matches retreat at once to a e quietly until the

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may retire to rest with not a speck of cloud anywhere above the horizon, and wake up a little after midnight, with the incessant roll of thunder in his ears, and his eyes blinded with the vivid lightning. It is now that the unwary traveller pays the penalty for being ignorant. Carelessly pitched tents are blown down, or the rain pours through, and everything is thoroughly soaked. Morning breaks, and the goods are found injured by the rain, and to complete the disaster, the horses have stampeded and are nowhere to be found. Nearly all travellers relate such occurrences as happening to themselves, and seem to see no way of preventing the disaster. Prevention is very easy, and the careful traveller is never caught unprepared.

When seeking a camping place for the night, any time during the summer, an elevated spot, near a pool of water, should be chosen, so that comparative freedom from mosquitoes may be secured if there should be a little wind. Feed and shelter for the horses are absolutely necessary, as both may be needed any night. All the conveyances should be placed west of the tents, and each tent securely tied to a cart by a guy rope passing over the end of the ridge-pole. The rear of the tents should be next to the carts, so that should a storm arise in the night, there would be no danger of the tents being blown down. By taking these precautions, no storm can do much damage, and men fall into the habit of doing this as a matter of routine.

In the latter part of June, 1879, I encamped on the prairie, just west of Qu'Appelle, but on the plateau above the river valley. About three hundred yards distant, another exploring party stopped for the night. We arranged our camp in our usual manner, and retired to rest. About two o'clock, a.m., a terrific rain, thunder, and wind storm broke over us, and for five hours we lay and listened to the terrific uproar. After the rain ceased we attempted to make a fire, but could not succeed for some time owing to

the force of the wind and wetness of the wood. Our tents had withstood the tempest's power and kept us perfectly dry. Not so with our friends in the other camp. Their tent had been blown down at the commencement of the storm, and there was not a man in the camp that had a dry rag. Of course, in letters to their friends, they omitted to state that their wretchedness was the result of their own carelessness. I visited their camp and found that the storm was altogether unexpected and had caught them unprepared, and their tents tumbled about their ears in a few minutes.

Horses will not face a severe rain and wind storm on the prairie, so that it is absolutely necessary to stop if the storm is meeting you. On the approach of a thunder storm in the day time, which may be of short duration, it is only necessary to turn the horses heads away from the storm, and they will stand perfectly quiet. The men can get under the carts or stand out in the rain, as it suits them. Care must be taken that horses do not stampede in a storm, as many travellers through the carelessness of their teamsters lose much time through this cause.

All through the summer, mosquitoes are very trouble, some at night, and often put the horses almost wild. Every evening, it is necessary to make a "smudge" to keep off the flies and enable the horses to eat a little during the night. It is made by lighting a fire with a little dry wood, and then putting on green sticks and covering all up with sods, so as to make a continuous smoke. When flies are troublesome and a little wind stirring, horses always feed head to wind, and it is necessary to note the direction of the wind before retiring to rest, as it is nothing unusual to find that the horses have gone off miles during the night. By noting how the wind blows in the evening and how it is in the morning, a man of some experience will always go straight to the horses, even if they are miles

wood. Our tents kept us perfectly sheltered from the camp. Their commencement of the trip that had a dry season, they omitted to consult of their own finding that the weather caught them unprepared in a few

wind storm on the way to stop if the effect of a thunder storm. In duration, it is only a day from the storm, but the men can get on as it suits them. They are impeded in a storm. Loss of their team-

is a very trouble, most wild. Every day "edge" to keep off a little during the winter a little dry wood, being all up with them. When flies are present horses always feed in the direction of the wind, which is unusual to them during the winter. In the evening and morning experience will tell they are miles

away. Many parties think it cruel to hobble horses every night after having been in harness all day, but experience proves that horses eat more and wander less by adopting this practice. My practice was always to make a smudge, hobble my horses in good pasture, and trust to their being all right in the morning. By following this practice I never lost a horse, and during two summers, travelled 4,300 miles up and down the prairie chiefly by compass.

Besides looking to the comfort of our horses, we should be careful of ourselves and always take pains to make ourselves comfortable. The chief trouble of the North-West is the mosquito, and to a sensitive person, they are a source of constant torture. I have seen men so punished by them, that their eyes were closed, their necks swollen, and they suffered great agony. There is no use in disguising the fact of their constant presence, and of their being a real plague. Settlers on the prairie must expect them for years to come, but with the progress of settlement they will in a great measure disappear. Tents can be kept clear of mosquitoes only by closing every aperture by which they can enter, as one small hole will often admit more flies than two men can dispose of. They enter tents just in the same way that bees enter a hive, and should one make its way in it will be followed by hundreds in a short time. After closing the tent so that none could enter, a man, with a lighted candle, soon singed the wings of those within, and for the evening and night we had immunity from their attacks.

On account of the flies the rule is to pitch the tent in summer always on a knoll, but in winter or after the flies have disappeared in a low sheltered spot. In the depth of winter, tents are not used by travellers except they are supplied with a small stove. A winter camping place is chosen in a thicket or grove where wood is abundant. Should the party be travelling where there is spruce or any coniferous trees, one section of the party gets wood while

the other clears away the snow from where the sleeping place and fire are to be. Brush is strewn thickly for a bed and in the direction of the wind it is piled up to make a wind-break. The fire is built in front and along the back a piece of canvas is stretched which keeps out the wind and reflects the heat. Buffalo robes and blankets are now spread on the boughs, and although the temperature of the air may be far below zero, comfort and genuine pleasure reign in the bivouac, and no thought of discomfort enters the mind of any one. I have lain in such camps when the temperature was very low, and never experienced any real discomfort. White men always lie with their feet to the fire, but very frequently the Indians lie with their side to it, and when one side gets cold they get up, put on a fresh log, and lie down in the opposite direction.

Some years since it was rather difficult to obtain good water on many of the trails, and few ventured to leave them in search of it. A Half-breed's plan of getting good water is to taste it, and if it is no worse than a weak infusion of Epsom salts he will pronounce it very good for tea. After some experience and close observation I discovered that where a certain species of sedge (*Carex aristata*) grew in profusion there I might look for good water at any season if the grass remained green. Late in the fall many pools that contained good water in the summer become brackish. This was formerly the case in and around the Touchwood Hills, and much difficulty was experienced in obtaining sweet water. In the fall of 1879 I noticed every pond that contained green sedge had sweet water. On the other hand those where the sedge was rotting and apparently dying invariably had brackish or very poor water. Since then I have carefully noted the water pools, and in all cases the sedge gave the same results. When the seasons become drier than they are at present many pools in Moose Mountain and the Touchwood Hills and other localities, which at

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Prairie fires are dangerous both to settlers and travellers, but especially to the former. During the month of August the grass begins to dry up owing to the great heat and the dryness of the atmosphere. September completes what August commenced, and by the first week in October all the grass is dry, and for hundreds of miles a continuous hay meadow extends without a break. At this time scarcely a shower falls, and in the middle of the day it is very warm and often the wind is strong. A party of travellers stop for dinner, and without due precaution light a fire, or a smoker throws down a lighted match. In an instant the grass is in a blaze, and before a person has time to think the fire is rods away and speeding over the prairie as fast as a horse can gallop. Numerous fires started as above have been known to run over 100 miles without stopping. Should the fire reach a trail in the night it will scarcely ever cross it as the ruts stop it most effectually. A fire on our buffalo plains is not the formidable affair that novelists and many travellers make it. The grass is generally short, seldom over a foot high, and on this account the fire never attains much volume.

Although many times quite close to fires, in only one instance did I have to protect myself from them. While lying in camp on the plain nearly 100 miles southwest of Battleford on the first Sabbath of October, 1879, my assistant noticed huge volumes of smoke rising in the southwest, but a great distance off. He and I were travelling alone, and naturally felt some fear of the fire reaching us. Without any hesitation he ran for the horses, and besides hobbling them we fastened a long line to each of them and tied them to the carts. We at once took down our tent and packed everything up, putting all our stuff in the carts. We saw that the fire was coming straight for us, and that a very

short time would elapse before it would be upon us. The sun was setting and before dark we harnessed the horses and placed them in the carts and moved to a small patch of sandy ground where the grass was quite thin and waited for the enemy. The lurid glare in the heavens kept increasing as the shadows of evening fell, and darkness had not settled over the prairie before we saw long tongues of flame thrown up against the sky from a distant ridge; these disappeared and the bright glare only remained. A few minutes pass and a nearer ridge is reached and a long line of fire is seen to cross it and disappear. Horses and men are now aroused, and I try if the grass where we are will carry fire and find it will not. We at once move to its outer edge and securely fasten our horses, so that they may not break loose and leave us. A few minutes more and the fire has passed the last ridge, and with the speed of a fast horse it bears down upon us. As it came near us the whirling smoke and leaping flames seemed to take the forms of living things that were in terrible agony and added largely to the sublimity of the spectacle. When it reached our oasis it swept past on either side, and a few gulps of smoke, accompanied with a strong hot wind, were the only discomforts it caused us. When it was past we saw that it kept an even front, and wherever the grass was long and thick the flame continued for some time after the first rush had passed.

A stiff gale had been blowing all day and continued through the night, and before the next evening, this fire reached the Eagle Hills, and burnt up all the hay cut by Red Pheasant's band. Where it burnt the hay, it was fully 130 miles to the northeast of us. This same fire swept up between the two Saskatchewan the next night, and burnt up the tent of a party of the Mounted Police who barely escaped with their lives, as the fire came upon them when they were asleep. Ten days after, I crossed the same tract, and for twenty-four miles our horses never obtained a mouthful of food, as the fire had licked it all up.

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Settlers can easily protect their houses, barns, and stocks by ploughing a few furrows around them, and without this or something else is done there is no safety. Burning a ring of grass, in the evening, outside of the ploughing is more effectual, but this should be done during a calm evening, and the fire stopped after it has burned the required breadth. Many new comers think these precautions are unnecessary, and hence the doleful accounts of the loss of hay and even houses, which we read of from time to time.

While travelling on the prairie, in September and October, no fire should be lit in the middle of the day, without two or three persons are standing ready to extinguish the grass when sufficient ground is burnt over, for safety. No fire should be left uncovered when the party moves away, and it is the duty of the leader to see personally that all fire is either extinguished or covered up. There is a penalty of \$200 for the starting of a prairie fire, and as the informer gets half the fine, Indians and Half-breeds are constantly on the alert, during the dangerous season, to pounce on any delinquent. Many people blame the Indians for setting the prairie on fire, but my experience leads me to lay the blame on white men, especially the young bloods who go shooting in the fall. A stump of a cigar dropped on the prairie is much more dangerous than an Indian fire.

Travelling on the prairie is an easy matter with or without a road. Experience combined with intelligence, however, are necessary to ensure success. My plan is never to combat a difficulty without seeing my way to overcome it. Most people, when travelling, take a guide or a man who has been over the country before, and who knows or professes to know where the water-pools are. As a rule, these men have not a high order of intelligence, and dare not venture off the beaten track. They know nothing of the use of the compass, and laugh at any person thinking to cross the country by the aid of one. Should these parties

get into a region not visited by them before they are perfectly helpless, and will do more harm than good.

When the Mounted Police first entered the country, they always took a guide when moving from point to point. On one occasion, when Colonel Irvine and party were passing from Fort Walsh to the Saskatchewan, in the direction of Battleford, they camped on the open plain. In the morning, when they started off, the atmosphere was cloudy and the sun obscured. After travelling steadily all day, they reached their old camping place in the evening, although they thought they were forty miles away from it. When questioned, the old guide explained that he had travelled with the wind on his right hand all day, and could not be blamed if it changed. Numerous instances of a like nature could be related, each instance showing that guides are mere encumbrances when in an unknown district. Should any person be travelling in the surveyed districts, Captain Allen's Prospector's Manual will be found invaluable, as it is superior to a whole army of unlettered guides, and will never lead any one astray. Outside of the surveys, a map and pocket compass are necessary, and these should be studied constantly until the mind takes in the whole country, and a traverse of an unknown region becomes only a pleasurable excitement. Owing to the absence of woods and the rolling character of the country, parties may cross it in any direction, provided they take the risk of finding water at convenient distances.

White mud swamps are the terror of both Indians and Half-breeds. Should a person incautiously attempt to cross one or even lead a horse to the margin to drink, he will find it a difficult matter to get on firm ground again. In the south, where the rainfall is light, these swamps, in the dry season, are hard baked clay flats, covered with a sprinkling of saline plants. Proceeding northward, these gradually change their character, and pass into the much dreaded

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The much dreaded salt plain west of the Touchwood Hills, contains a number of swamps of the very worst description. Southwest of the hills we became entangled in a series of these, in the autumn of 1880, and it was only by hard work and much ingenuity that we saved our horses. When we entered on the clay flat it seemed quite hard, but first, one horse went down and then another, until nine were lying panting on the yielding surface. By the time we got across, both men and horses were almost worn out, as all the carts had to be taken over by hand, and the men had to assist the poor horses when they sunk down completely exhausted. Nearly all the "sloughs" spoken of by travellers are embryo white mud swamps. In every case, they are merely saturated Cretaceous clay, and pass from liquid "white" mud in the north to hard baked clay flats in the south. These constitute the "bad lands" of the south, and the saline swamps and "sloughs" of the north.

As a rule, creature comforts are provided in abundance by all travellers, and yet very few know how to make themselves comfortable under all circumstances. Tea and sufficient food of any kind will suit on the plains as all parties are blessed with a good appetite. Food, however, is not all that is necessary. In no case should a tent be pitched carelessly or with the door to the west. Many storms come up suddenly from that quarter in the night, and a carelessly pitched tent admits the rain or what is much worse the tent is blown down in the midst of the storm and every possession is sent to the four winds or is thoroughly soaked. No careful traveller will retire except he feels assured that he is secure for the night. When the camping place is

reached the evening may be beautiful and a gentle wind blowing, so that the mosquito is not abroad and the tired and possibly lazy travellers may decide to sleep under the canopy of heaven. After they get asleep the wind falls and they are awakened by the myriads of flies which cause them such discomfort that ever after when they think of that terrible night they shudder involuntarily. Flies and storms should always be expected in summer and always guarded against.

No person need have any fear of catching cold on the plains by exposure to the *night air*, as such a thing never happens. When preparing the tent for the night a waterproof blanket should always be placed next the ground and over that a buffalo robe with the hair side up. After this any kind of covering will do. Care must be taken on the return to civilization that the traveller does not *catch cold* by sleeping in a close room, as experience teaches that such rooms are extremely dangerous. It is wise to open the window and door of the room even if the temperature of the air is at zero, so that you may escape a severe cold. After the first season I always did this and by so doing escaped the colds that all surveyors complain of when they return to civilization.

Travellers should always have a five or ten gallon keg with them, and see that this is filled with good water at least once a day. When travelling without a guide this is absolutely necessary, as water may be extremely scarce in the district where a person may chance to be and great suffering may result. In July, 1880, myself and party were thirty hours without water owing to the carelessness of the men whose business it was to see that a supply was on hand. We were never without water again, and I gave no instructions regarding it. The above incident happened on the western part of the Great Souris Plain. The plain for sixty miles east of the Canadian Pacific Railway crossing Moose

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This Diagram is intended to illustrate the uniform disposition of Free Grant and Pre-emption Lands, also of Railway or Public Lands as the case may be, in each Township in Manitoba and the North-West Territories.

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30	SCHOOL 29 LANDS	28	27	H.B. CAS 26 LANDS	25
19	20	21	22	23	24
18	17	16	15	14	13
7	H.B. CAS 8 LANDS	9	10	SCHOOL 11 LANDS	12
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Homestead and Pre-emption Lands.



Railway or Public Lands, as the case may be.

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Jaw Creek is almost waterless, and great caution is necessary when traversing it. Many other localities where water is scarce might be cited, but it is unnecessary to mention them as wise men will be prepared for all such while fools will run to their own destruction, or like my party suffer for their neglect of known duty. Water suited for horses is generally obtainable at least once a day, but that for culinary purposes is much more scarce than many imagine. I speak of surface water.

It is not necessary to enumerate all the little things travellers should carry, but axes, a saw, an augur, a drawing knife, a spade, rope, and twine are absolutely required. wire of two sizes, a hammer, and clout nails or tacks should always be taken. Medicines are seldom needed, but salve and plaister for cuts should never be dispensed with as the traveller is liable at any moment to meet with an accident.

The cooking utensils should be in charge of one man even if only for a day at a time, and should be counted after every meal. Knives, forks, spoons, and many other small articles get into the grass and without constant watchfulness and extreme care get lost. Axes, whetstones, and knives are left lying around by most travellers, and are just the things most required on a long journey. In every well-organized party one man is detailed to go over every part of the camping ground after the others have started and pick up all the odds and ends that may have been left.

The chief difficulty experienced in traversing the country is the crossing of rivers and small streams. Besides the crossing there is the descent into the valley and the ascent out of it. With loaded carts and too often baulky horses this is no easy matter. At this time the spade is always useful to dig down the bank so that the water may be reached.

Sometimes the stream may only be a few feet wide but have a quagmire on either side and not a bush for miles.

In a case of this kind long grass or sedge is cut and a track made for the horse to walk on, and although he may tremble in every limb on account of the shaking of the bog he takes his load across. The others follow and that difficulty is surmounted. Another time a creek is reached that is quite narrow but running in a deep trench. The horses are taken from the carts, the ridge poles of the tents are stretched across the creek and the carts drawn across by hand.

In August, 1880, we reached the dry bed of a creek on the north side of the Cypress Hills, and after examining it for miles, found it apparently impassable. The banks of the creek were perpendicular, and the bed a quicksand. So soft was the sand that the man who tried it had to cross on his hands and knees. A brief consultation was held, and while one party cut down willows to bridge the quicksand, another dug down the banks. In an hour we were across and ready for our next difficulty which soon came. The day was extremely warm, men and horses were thirsty, and as it drew on towards noon, I climbed a hill and saw scarcely a mile away, a beautiful lake glistening in the sun. With joyful hearts we hurried on, and unhitched close to the lake. The horses naturally went to the water, but to our astonishment would not touch it. An examination showed that our beautiful lake was liquid mud, with scarcely an inch of water on the surface. We had our dinner, as we carried our own supply, but it was sundown before our utmost endeavors could find any for the horses.

On the 13th July, 1879, we reached the elbow of the South Saskatchewan, at the head of the Qu'Appelle valley. At this point, the river was 770 yards wide, and flowing with a steady current. Sixty miles to the north, there was a ferry, and forty miles to the south, Palliser had crossed, twenty-three years before, but with the loss of a waggon. After examining the river carefully, both above and below the Elbow, we decided to cross at that point. The means

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was the next consideration. There was no timber to construct a raft, so we decided to build a boat. We had no boards, but we had a large tent, water proof blankets, and cart covers.

John Matheson, of Winnipeg, who had charge of the horses and outfit generally, made a wooden frame about nine feet long and four and a half feet wide at the stern, shaped like the letter A, and interlaced it with willows. Over this we put the tent, and over all we nailed the water-proof blankets. By means of this frail boat, we purposed taking across a river nearly half a mile wide, four months provisions, all our camp equipage, four carts, and two buckboards, besides risking our own lives.

The night before we undertook to cross was an anxious one, and shortly after sunrise we were ready to make the attempt. Our boat was found to leak considerably, but one man bailing could keep it afloat. A small load was put on board, and one man pulling two small oars and another bailing, they started. After crossing a small branch close to us, they drew the boat for a long distance up the river by walking on a sand bar. When they thought they had ascended far enough, they attempted to cross the main channel, but the width (over 500 yards) being much greater than they expected, they were unable to make the shore, and landed the stuff on an island near the further side. In coming back, they were carried over half a mile below our camp, and had to haul the boat up. They were in good spirits, however, as the boat was quite safe, and by going further up the bar they were sure they could make the land. Another load was soon on board and hauled far up the sand bar, and was easily taken across. All working with a will, the greater part of the provisions and baggage were across before night. Much time was lost in getting the horses across, as they frequently turned back when almost half across. One or two were nearly drowned, be-

ing unable to stem the current for 500 yards on a stretch. These, after resting a while on a bar some distance below us, finally reached the shore. The next forenoon we brought over the remainder of our outfit, and by sundown camped on the crest of the valley, with the mighty river sweeping in graceful curves at our feet. Behind us lay the river, and in our front those illimitable plains which on our maps were shown as a waterless and treeless desert. On the morrow, we entered on the great plain which we eventually traversed in every direction, and lifted the veil which had enshrouded it for many years.

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CHAPTER XXXV.

North-West Land Regulations and Mode of Survey.

Inauguration of the Surveys—The International Boundary—Principal Meridians—Size of Townships—Numbering of Ranges and Townships—Base Lines—Correction Lines—Size of Townships—Road Allowances—How Survey Lines are Marked on the Ground—Dominion Land Regulations—Diagram showing the Division of a Township into Sections—General Regulations—Homesteads and Pre-emptions—Colonization Plan Number One—Plan Number Two—Timber for Settlers—Pasturage Lands—General Provisions—Canadian Pacific Railway Lands—Conditions of Sale—Liberality of Canadian Land Regulations—Hudson's Bay Company's Lands—School Lands—Lands at Private Sale.

IMMEDIATELY after the preliminaries for the transfer of the North-West Territories had been arranged between the Imperial and Dominion Governments, Colonel J. S. Dennis, D.L.S. (late Deputy Minister of the Interior), was, on the 10th July, 1869, directed by the Hon. William Macdougall, Minister of Public Works, to repair to the Red River and prepare a plan for laying out the country into Townships. After visiting the country and consulting with the Crown Lands Department of the Dominion and the Public Lands Department of the United States, a plan of survey was drawn up and adopted by the Minister of the Interior.

During the summer of 1873 the International Boundary, lat. 49°, was established by the Boundary Commission appointed by the Imperial and United States Governments. This line was fixed upon as the base of the surveys, and was thereafter known as the "First Base." From this line others were run at right angles northward and named Principal Meridians. The First Principal Meridian runs northward from a point on the International Boundary, about eleven miles west of the town of Emerson. The Second Principal Meridian is established upon the 102nd meridian of west longitude, passing about thirty miles west

of Fort Ellice. The Third, Fourth, and Fifth Principal Meridians are identical with the 106th, 110th and 114th Meridians respectively. The latter passes close to Forts Calgary and Edmonton.

After mature deliberation it was decided to lay out the country in four-sided townships of almost a square form. Each township measures on its east and west sides from centre to centre of the road allowances, which form its actual boundaries, exactly 483 chains, and on its north and south sides 486 chains more or less, subject to the deficiency or surplus resulting from the convergence or divergence of the meridians, as the case may be, caused by the curvature of the surface of the earth. In numbering these townships certain terms were adopted which gave precision to each township no matter where situated. Starting at the First Principal Meridian on the International Boundary, the first township west of the Meridian was termed Range I, the next west, Range II, and so on till the Second Principal Meridian was reached, when the numbering commenced again. It will thus be seen that the first township west of any Principal Meridian is in Range I west, and so on in regular order. The next step was to give position, and the first township was numbered Township 1, the next north Township 2, and so on as far as the surveys extend to the north.

After establishing the First Base, or International Boundary, other lines were run twenty-four miles apart, parallel to this one and numbered Second, Third, Fourth, and Fifth Base as far as the surveys extend to the north. The country is afterwards laid out into blocks twenty-four miles square, or nearly that, each block containing sixteen townships. These blocks are contained between four straight lines, having a Base Line at the north and at the south. Exactly twelve miles from either Base a line is run east and west, named a "Correction Line," and on this line all correc-

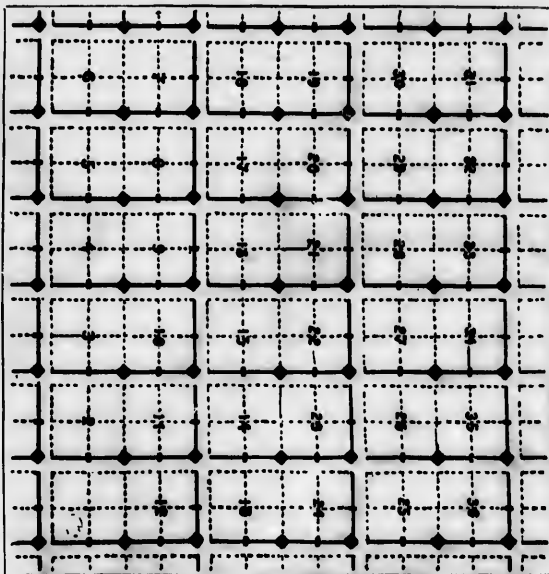
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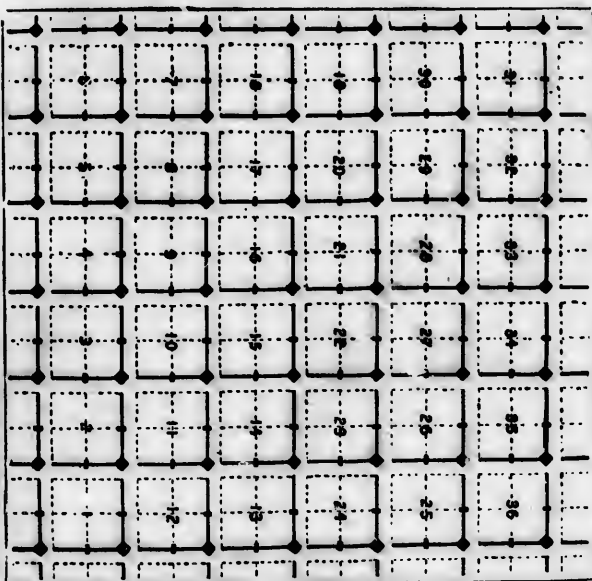
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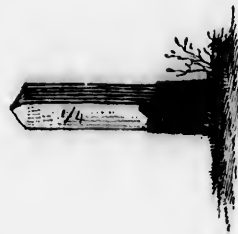
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THE PRESENT SYSTEM OF SURVEYING A TOWNSHIP SHOWING POSITION OF
POLES AND LINES.



THE OLD SYSTEM OF SURVEYING A TOWNSHIP SHOWING POSITION OF
POLES AND LINES.





Quarter Section Post.



Stone Corner.



Section Post.



Earth Mound and Post.



Stone Mound.



Witness Mound.

tions occasioned by the convergence of meridians or any other cause are made. East of the First Principal Meridian the Ranges are numbered *east* of that meridian and the townships numbered as usual.

Every township is sub-divided into thirty-six "sections," each containing one square mile or 640 acres, more or less. All townships are subject to the conveyance and divergence of meridians, together with certain road allowances having a width of one chain on each section line running north and south, and on every alternate section line running east and west. Under the old system of survey all road allowances were one chain and a half (110 feet) wide, but a new system was inaugurated last year by which all are now reduced to one chain (66 feet). Diagram No. 1 gives a township as laid out under the old system of survey, and No. 2, one under the new system.

The following extracts are taken from an excellent little work published by Captain C. W. Allen, of Winnipeg, entitled the Land Prospector's Manual and Field Book:—

"Survey lines are marked on the ground by the planting or erecting of such posts, stones, mounds, or other monuments as will serve the temporary purpose of guiding Prospectors through the country, and which also constitute permanent landmarks to establish the legal boundaries of farms held by different proprietors.

"Only a single row of posts (or other monuments) to indicate the corners of townships, sections, or quarter-sections is placed on the ground to show the line surveyed, except in the case of correction lines. Such posts are invariably planted along the *western* limit of the road allowance on all lines running north and south, and in the *southern* limit of the road allowance on all lines running east and west. It follows, accordingly, that such corner posts always stand on the northeast corner of the township, section, or quarter-sections to which they belong; also, that these single lines



of posts govern the relative position of the corners on the opposite sides of the road allowance (or road allowances) on which they stand, whether the same may be those of adjacent townships, sections, or quarter sections. (See diagram No. 2.")

On correction lines, however, the boundaries *on both sides* of the road allowance are planted with monuments indicating the township, section, and quarter-section corners.

"The kind of monument employed varies somewhat, according to the material available in the locality surveyed; but the position in which all such are placed is governed by unalterable rules, and the inscriptions or marks are all in conformity.

"*In a timbered country*, a post, three inches square, and showing two feet above ground is firmly planted at the township or section corner to be indicated, and it bears marks as hereafter described.

The post distinguishing a quarter-section corner in such a region is three inches wide, being flattened on two sides, and it stands eighteen inches only above the surface, with the flattened sides at right angles to the line on which it stands. In a wooded region where stone abounds, corners are sometimes defined by simple stones correctly planted and properly marked. The position of all such corners are indicated by simple monuments, such as a post or stone, and further defined by the astronomical bearing, and distance therefrom being marked in red chalk upon some adjacent tree, the side of which nearest to the monument is also inscribed with the letters "B. T." cut into the trunk."

"*In a prairie country*, the posts stand in the centre of mounds, generally of earth, thrown up in the form of right-angled pyramids. At the corners of townships, these mounds are three feet high, their bases being six feet square; at the corners of sections or quarter-sections the mounds stand at two feet and six inches high, and their

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"If a township or other corner fall in a ravine, the bed of a stream, or some similar situation where it would be impossible to erect a monument of a permanent character, and should a "bearing tree" not be obtainable the surveyor indicates the position of such corner by erecting at the nearest suitable spot a "witness mound." In this case the mound is in the form of a cone 2ft. 6in. high, its base having a diameter of 6ft. The post in the centre is marked "W. M." and also inscribed, in red chalk, with the bearing and distance to such corner.

"The posts in all mounds show at least ten inches above the apex of the same, whether the latter have been built of earth or stones.

"On ordinary surveyed lines the posts and mounds are so placed that their angles rest upon the line on which they stand.

"On correction lines, however, the post and mounds are erected square with the line, which passes through the centre of two sides of the mound.

"Iron posts, which are placed at every *township* corner, consist of either iron bars or tubes, driven into the ground with a sledge, and inscribed, by means of a cold chisel, with the necessary marks. The mounds in connection with such monuments form an exception to the general rule, in that they are so placed that the iron post stands at the northern angle thereof. There is, however, with iron posts, the usual difference in respect to monuments on correction lines, the mounds in connection with which are built with their bases facing the cardinal points of the compass, the iron post

being established in the centre of the base of the mound fronting the road allowance.

"The letters, marks, and figures on posts and trees are distinctly cut in with a knife or scribing iron; those on iron posts and stone corners with a cold chisel.

"Quarter-section corner posts are simply marked with the conventional sign " $\frac{1}{4}$ " to indicate their character, and bear no inscription showing to what township or range they belong.

"Posts or stone monuments indicating all other corners bear sufficient marks to thoroughly indicate the position they are intended to legally establish; and must always be read from the top of the post downwards.

"On township corners the upper figure on either side of the post indicates the number of the township which that side of the post faces, and the next figure indicates the range.

"On all other section corners, whether on township lines or in the interior of a township, the numbers of the sections only are to be found on the corresponding faces of three sides of the post; but in addition to the section number, the number of the township and that of the range appear on the fourth face, which is invariably the south-west one.

"The posts planted along the correction lines simply exhibit marks to show the number of the townships and sections the boundaries of which they form respectively. *Township* corners have the number of the section shown on the west side of the post, and the numbers of the township and range on its north side. In cases where the posts stand in the *northern* limit of the road allowance, the letter "R" for road alone is marked on the other two sides. A correspondingly opposite plan will be found to have been adopted in marking the township corner posts in the *southern* limit of the road allowance on correction lines. *Section* corner posts on correction lines have the numbers of the sections on

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their east and west sides, the letter "R" on the side facing the roadway, and on the fourth side the number of the township and range. "In ranges numbered from the First Principal Meridian the letters "E" or "W" are marked on the post after the number of the range, to denote that it is east or west of that meridian."

The settler from the United Kingdom will at first find the nomenclature of this system of survey a little new and strange; but he will, on slight acquaintance with it, become charmed with its simplicity and accuracy.

The surveys are marked on the prairie itself by iron and other kinds of monuments and posts at the corners of the divisions and subdivisions; and so soon as the settler makes himself acquainted with these, he will instantly understand the position and extent of his own farm on the prairie, or of any other in the country; or when travelling in any part of the country these posts will tell him at a glance exactly where he is.

A settler may obtain a grant of 160 acres of land free, or *even numbered* sections, on the condition of three years continued residence, and payment of the office fees amounting to ten dollars, and he may purchase on reasonable terms adjoining portions of sections.

A settler should obtain from the Government Agents general information as to lands open for settlement.

All *even numbered* sections (except 8 and 26, which are Hudson's Bay Company's Lands) belong to the Government, and are open, being specially reserved, for free homesteads and pre-emptions.

Odd numbered sections (with exception of 11 and 29, which are School Lands) for twenty-four miles on each side of the Canadian Pacific Railway, may be generally stated to be railway lands, purchasable from the Company, and not open to homestead and pre-emptions.

DOMINION LAND REGULATIONS.

DIAGRAM showing the division of a Township into sections. Each section—a square mile—is subdivided into quarter sections of 160 acres. Those shaded green are reserved for Free Grant Homesteads and their attached Pre-emption.

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The following Regulations for the sale and settlement of Dominion Lands in the Province of Manitoba and the North-West Territories shall, on and after the first day of January, 1882, be substituted for the Regulations now in force, bearing date the twenty-fifth day of May, 1881 :—

1. The surveyed lands in Manitoba and the North-West Territories shall, for the purposes of these Regulations, be classified as follows :

Class A.—Lands within twenty-four miles of the main line or any branch line of the Canadian Pacific Railway, on either side thereof.

Class B.—Lands within twenty miles, on either side, of any projected line of railway (other than the Canadian Pacific Railway) approved by Order in Council published in the "Canada Gazette."

Class C.—Lands south of the main line of the Canadian Pacific Railway not included in Class A or B.

Class D.—Lands other than those in Classes A, B, and C.

2. The even-numbered sections in all the foregoing classes are to be held exclusively for homesteads and pre-emption.

a. Except in Class D, where they may be affected by colonization agreements as hereinafter provided ;

b. Except where it may be necessary, out of them, to provide wood lots for settlers ;

c. Except in cases where the Minister of the Interior, under provisions of the Dominion Land Acts, may deem it expedient to withdraw certain lands, and sell them at public auction or otherwise deal with them as the Governor in Council may direct.

3. The odd-numbered sections in Class A are reserved for the Canadian Pacific Railway Company.

4. The odd-numbered sections in Classes B and C shall be for sale at \$2.50 per acre payable at time of sale ;

a. Except where they have been or may be dealt with otherwise by the Governor General in Council.

5. The odd-numbered sections in Class D shall be for sale at \$2 per acre, payable at time of sale.

c. Except where they have been or may be dealt with otherwise by the Governor in Council.

b. Except lands affected by colonization agreements, as hereinafter provided

c. Persons who, subsequent to survey, but before the issue of the Order in Council of 9th October, 1879, excluding odd-numbered sections from homestead entry, took possession of land in odd-numbered sections by residing on and cultivating the same, shall, if continuing so to occupy them, be permitted to obtain homestead and pre-emption entries as if they were on even-numbered sections.

PRE-EMPTIONS.

7. The prices for pre-emption lots shall be as follows:

For lands in Classes A, B and C, \$2.50 per acre.

For lands in Class D, \$2 00 per acre.

Payments shall be made in one sum at the end of three years from the date of entry, or at such earlier date as a settler may, under the provisions of the Dominion Land Acts, obtain a patent for the homestead to which such pre-emption lot belongs.

COLONIZATION.

Plan Number One.

8. Agreements may be entered into with any company or person (hereinafter called the party) to colonize and settle tracts of land on the following conditions:

a. The party applying must satisfy the Government of its good faith and ability to fulfil the stipulations contained in these regulations.

b. The tract of land granted to any party shall be in Class D.

9. The odd-numbered sections within such tract may be sold to the party at \$2 per acre, payable, one-fifth in cash at the time of entering into the contract, and the balance in four equal annual instalments from and after that time. The party shall also pay to the Government five cents per acre for the survey of the land purchased by it, the same to be payable in four equal annual instalments at the same times as the instalments of the purchase money. Interest, at the rate of six per cent. per annum shall be charged on all past due instalments.

a. The party shall, within five years from the date of the contract, colonize its tract.

b. Such colonization shall consist in placing two settlers on homesteads on each even-numbered section, and also two settlers on each odd-numbered section.

c. The party may be secured for advances made to settlers on homesteads according to the provisions of the 10th section of the Act 44 Victoria, Cap. 16—(the Act passed in 1881, to amend the Dominion Lands Acts).

d. The homestead of 160 acres shall be the property of the settler, and he shall have the right to purchase the pre-emption lot belonging to his homestead at \$2 per acre, payable in one sum at the end of three years from the date of entry, or at such earlier date as he may, under the provisions of the Dominion Lands Acts, obtain a patent for his homestead.

e. When the settler on a homestead does not take entry for the pre-emption lot to which he has a right, the party may within three months after the settler's right has elapsed purchase the same at \$2 per acre, payable in cash at the time of purchase.

10. In consideration of having colonized its tract of land in the manner set forth in sub-section b of the last preceding clause, the party shall be allowed a rebate of one-half the original purchase-money of the odd-numbered sections in its tract.

a. During each of the five years covered by the contract an enumeration shall be made of the settlers placed by the party in its tract, in accordance with sub-section b of clause 9 of these regulations, and for each *bonâ fide* settler so found therein a rebate of one hundred and twenty dollars shall be credited to the party; but the sums so credited shall not, in the aggre-

gate, at any time exceed one hundred and twenty dollars for each *bona fide* settler found within the tract, in accordance with the said sub-section, at the time of the latest enumeration.

- b. On the expiration of the five years, an enumeration shall be made of the *bona fide* settlers on the tract, and if they are found to be as many in number and placed in the manner stipulated for in sub-section b of clause 9 of these regulations, a further and final rebate of forty dollars per settler shall be credited to the party, which sum, when added to those previously credited, will amount to one-half of the purchase money of the odd-numbered sections and reduce the price thereof to one dollar per acre. But if it should be found that the full number of settlers required by these regulations are not placed in conformity with sub-section b of clause 9 of these regulations, then for each settler fewer than the required number, or not placed in conformity with the said sub-section, the party shall forfeit one hundred and sixty dollars of rebate.
- c. If at any time during the existence of the contract the party shall have failed to perform any of the conditions thereof, the Governor in Council may cancel the sale of the land purchased by it, and deal with the party as may seem meet under the circumstances.
- d. To be entitled to rebate, the party shall furnish to the Minister of the Interior evidence that will satisfy him that the tract has been colonized and settled in accordance with sub-section b of clause 9 of these regulations.

Plan Number Two.

11. To encourage settlement by capitalists who may desire to cultivate larger farms than can be purchased where the regulations provide that two settlers shall be placed on each section, agreements may be entered into with any company or person (hereinafter called the party) to colonize and settle tracts of land on the following conditions:

- a. The party applying must satisfy the Government of its good faith and ability to fulfil the stipulations contained in these regulations.
- b. The tract of land granted to any party shall be in class D.
- c. All the land within the tract may be sold to the party at two dollars per acre, payable in cash, at the time of entering into the contract. The party shall, at the same time, pay to the Government five cents per acre for the survey of the land purchased by it.
- d. The party shall, within five years from the date of the contract, colonize the township or townships comprised within its tract.
- e. Such colonization shall consist in placing one hundred and twenty-eight *bona fide* settlers within each township.

12. In consideration of having colonized its tract of land in the manner set forth in sub-section e of the last preceding clause, the party shall be allowed a rebate of one-half of the original purchase money of its tract.

- a. During each of the five years covered by the contract, an enumeration shall be made of the settlers placed by the party in its tract, in accordance with sub-section e of clause 11 of these regulations, and for each *bona fide* settler so found therein a rebate of one hundred and twenty dollars shall be repaid to the party; but the sums so repaid shall not, in the aggregate, at any time exceed one hundred and twenty dollars for each

dollars for each *bond fide* settler found within the tract, in accordance with the said sub-section, at the time of the latest enumeration.

shall be made of the *bond fide* settlers placed by the party in its tract, and if they are found to be as many in number and placed in the manner stipulated for in sub-section e of clause 11 of these regulations, a further and final rebate of forty dollars per settler shall be repaid, which sum when added to those previously repaid to the party will amount to one-half of the purchase money of its tract and reduce the price thereof to one dollar per acre. But if it should be found that the full number of settlers required by these regulations are not on the tract, or are not placed in conformity with the said sub-section, then, for each settler fewer than the required number or not settled in conformity with the said sub-section, the party shall forfeit one hundred and sixty dollars of rebate.

the party shall have the Interior evidence that will satisfy him that the tract has been colonized and settled in accordance with sub-section e of clause 11 of these regulations.

to the Minister of the Interior shall furnish to the Minister of the Interior evidence that will satisfy him that the tract has been colonized and settled in accordance with sub-section e of clause 11 of these regulations.

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bond fide settler found within the tract, in accordance with the said sub-section, at the time of the latest enumeration.

- b. On the expiration of the five years, an enumeration shall be made of the *bond fide* settlers placed by the party in its tract, and if they are found to be as many in number and placed in the manner stipulated for in sub-section e of clause 11 of these regulations, a further and final rebate of forty dollars per settler shall be repaid, which sum when added to those previously repaid to the party will amount to one-half of the purchase money of its tract and reduce the price thereof to one dollar per acre. But if it should be found that the full number of settlers required by these regulations are not on the tract, or are not placed in conformity with the said sub-section, then, for each settler fewer than the required number or not settled in conformity with the said sub-section, the party shall forfeit one hundred and sixty dollars of rebate.
- c. To be entitled to rebate, the party shall furnish to the Minister of the Interior evidence that will satisfy him that the tract has been colonized and settled in accordance with sub-section e of clause 11 of these regulations.

Official Notice.

13. The Government shall give notice in the *Canada Gazette* of all agreements entered into for the colonization and settlement of tracts of land under the foregoing plans, in order that the public may respect the rights of the purchasers.

TIMBER FOR SETTLERS.

14. The Minister of the Interior may direct the reservation of any odd or even-numbered section having timber upon it, to provide wood for homestead settlers on sections without it; and each such settler may, where the opportunity for so doing exists, purchase a wood lot, not exceeding twenty acres, at the price of \$5 per acre in cash.

15. The Minister of the Interior may grant, under the provisions of the Dominion Lands Acts, licenses to cut timber on lands within surveyed townships. The lands covered by such licenses are thereby withdrawn from homestead and pre-emption entry and from sale.

PASTURAGE LANDS.

16. Under the authority of the Act 44 Vic., Cap. 16, leases of tracts for grazing purposes may be granted on the following conditions:—

- a. Such leases to be for a period of not exceeding twenty-one years, and no single lease shall cover a greater area than 100,000 acres.
- b. In surveyed territory, the land embraced by the lease shall be described in townships and sections. In unsurveyed territory, the party to whom a lease may be promised shall, before the issue of the lease, cause a survey of the tract to be made, at his own expense, by a Dominion Lands Surveyor, under instructions from the Surveyor-General; and the plan and field notes of such survey shall be deposited on record in the Department of the Interior.
- c. The lessee shall pay an annual rental at the rate of \$10 for every 1,000 acres embraced by his lease, and shall within three years from the granting of the lease, place on the tract one head of cattle for every ten acres of land embraced by the lease, and shall during its term maintain cattle in at least that proportion.

- d. After placing the prescribed number of cattle upon the tract leased, the lessee may purchase land within his leasehold for a home farm and corral, paying therefor \$2.00 per acre in cash.
- e. Failure to fulfil any of the conditions of his lease shall subject the lessee to forfeiture thereof.

17. When two or more parties apply for a grazing lease of the same land, tenders shall be invited, and the lease shall be granted to the party offering the highest premium therefor in addition to the rental. The said premium to be paid before the issue of the lease.

GENERAL PROVISIONS.

18. Payments for land may be in cash, scrip, or police or military bounty warrants.

19. These regulations shall not apply to lands valuable for town plots, or to coal or other mineral lands, or to stone or marble quarries, or to lands having water power thereon; or to sections 11 and 29 in each Township, which are School Lands, or Sections 8 and 26, which belong to the Hudson's Bay Company.

By order,

DEPARTMENT OF THE INTERIOR,
OTTAWA, 23rd December, 1881.

LINDSAY RUSSELL,
Surveyor General.

CANADIAN PACIFIC RAILWAY LANDS.

The land subsidy to the Canadian Pacific Railway Company consisting of 25,000,000 acres, the odd numbered sections are set aside for the purpose of this grant, for twenty-four miles on each side of the Canadian Pacific Railway (see Clause 2 of the Official Land Regulations). As these sections everywhere alternate with the even numbered ones held by the Government for free grants and pre-emp-tions, it is advisable to give here the regulations of the Pacific Railway for the sale and disposal of their lands.

The following is a copy :—

THE CANADIAN PACIFIC RAILWAY COMPANY,
Montreal, Canada, Nov. 24th, 1881.

The Company are prepared, until further notice, to sell lands for agricultural purposes, at the price of \$2.50 per acre, one-sixth payable in cash, and the balance in five annual instalments, with interest at six per cent., a rebate for actual cultivation being made as hereafter described.

The general conditions of sale are :—

1. That all improvements placed upon land purchased shall remain thereon until final payment for the land has been made.
2. That all taxes and assessments lawfully imposed upon the land or improvements, shall be paid by the purchaser.
3. The Company reserve all mineral, coal or wood-lands, lands with water power thereon, or tracts for town sites and railway purposes; but as regards wood

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lands, the purchaser will be permitted to cut a sufficient quantity for fuel, fencing, and for the erection of buildings on his land.

4. The purchaser will be required within four years from the date of the contract for the purchase of the land, to bring under cultivation, and sow and reap a crop on three-fourths of the said land; but if he shall erect buildings thereon satisfactory to the Company, and shall reside thereon continuously for three years, then the quantity to be cultivated shall be reduced to one half. Dairy farming or mixed grain and dairy farming to an extent to be agreed upon, will be accepted as the equivalent of cultivation, entitling the settler to rebate.
5. A credit of \$1.25 per acre will be allowed for all land so cultivated during four years; an extension of the time being granted in consideration of the erection of buildings and other improvements.
6. A reservation of 200ft. in width for right of way or other railroad purposes will be made in all cases.
7. If the purchaser fails to carry out strictly the conditions of his contract within the specified time, the Company reserve the right to cancel the contract, whereupon the lands would become forfeited and revested in the Company. But in case of forfeiture the Company would take into consideration an application for a new sale to the original purchaser at a revaluation.
8. Special contracts will be made with Companies for large tracts of land for settlement purposes or for cattle raising.
9. Liberal rates for settlers and their effects will be granted by the Company over its railway.

For further information apply at the office of the Company, Bartholomew Place, London, England; to John McTavish, Land Commissioner, Winnipeg, Manitoba, or to the Secretary of the Company, at Montreal, Canada.

GEORGE STEPHEN, *President.*

CHARLES DRINKWATER, *Secretary.*

It will appear from a comparison of these conditions of sale by the Pacific Railway Company with the Dominion Government Land regulations, that if a family of four adults desire to settle together they may obtain a really large estate on very moderate terms. For instance, each of the four members of the family may settle on the four free homesteads, of 160 acres each, in any even numbered unoccupied section, each may then purchase another 160 acres at \$2.50 (10s. stg.) per acre from the Pacific Railway Company in the adjoining odd numbered sections. This is the same price as that offered by the Government pre-emption in the Railway Belt, with the exception that the Pacific Railway Company offer a rebate of \$1.25 (5s. stg.) per acre, within three to five years following the date of purchase, on condition of cultivation. The settlers while building on

the homesteads and making cultivation thereon, would be able, within the time mentioned, also to cultivate the whole or the greater part of the Pacific Railway lands. The office fees for the Government Homesteads are \$10 (£2 stg.). A family of four could, in this way, in three years obtain a large estate of 1,280 acres of probably the richest wheat growing land in the world, at a merely nominal price, and thus secure a position not only of comparative but of substantial wealth. Farmers with sons can with great advantage avail themselves of these conditions, and have the advantages of neighborhood in settling together.

In cases where it is an object for families with means to take up and farm more extensive tracts of land, the regulations would also admit of this. For instance, two brothers might take up free homesteads and two quarter sections of any Government lands and pre-empt the remaining two quarter sections, thus obtaining a whole section or 640 acres for their homesteads and pre-emptions. They could then purchase the whole of each of the four adjoining odd numbered sections of Railway lands, and thus obtain between them a large estate of 3,200 acres. By cultivating the odd sections and getting the rebate, this estate could be purchased on exceedingly moderate terms; while the rule of the Pacific Railway Company to insist on double the price of lands not cultivated, would act as a powerful dissuasive to acquiring lands for mere speculation, for the reason that the cultivation rebate is always open to the actual settler who, for some years to come, will have large tracts of land to choose from. The arrangement we have indicated is especially desirable for settlers from England with means.

It will be noticed that the price of the Pacific Railway lands is the same as that of the Government pre-emption in the Railway Belt. The terms of credit are also liberal.

The land policy of the Government of Canada, combined with the advantages offered by the Pacific Railway Com-

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Liberality of Canadian Land Regulations.

The Canadian Land Regulations having been very generally represented to be more onerous and less liberal than those of the United States, it is proper to point out for intending settlers that ten dollars (\$10) covers the whole of the office fees in Canada, either for a pre-emption or a homestead; but in the Western States there are three fees, one of eight dollars, payable on entry, another of eight dollars for a commission, and another of ten dollars when the patent is issued, making twenty-six dollars (\$26.00). In some of the States the fees are thirty-four dollars (\$34.00).

The lands are sold at \$2.35 and \$1.25 per acre. These prices are nearly the same, but the difference is favorable to Canada. In fact it is repeated that not on the Continent of America, and it is believed not elsewhere are the Land Regulations so favorable as in Canada.

It is provided by the Canadian Naturalization Act, that aliens may acquire and hold real and personal property of every description, in the same manner and in all respects, as a natural born British subject.

The only disqualification of aliens is, that they are not qualified to hold office under the Government, or to vote at parliamentary or municipal elections.

The oath of allegiance required of aliens who desire to become British subjects simply expresses fidelity to the Queen and Constitution, without any discrimination against the nation from which the aliens come.

To take up the United States Government land the following oath is required to be taken:—

DISTRICT COURT,
.....Judicial District, } State of.....
County of..... }
I.....do swear that I will support the Constitution

of the United States of America, and that I do absolutely and entirely Renounce and Abjure for ever all Allegiance and Fidelity to every Foreign Power, Prince, Potentate, State or Sovereignty whatever, and particularly to the *Queen*.....
of Great Britain and Ireland, whose subject I was. And further, that I never have borne any hereditary title, or been of any of the degrees of Nobility of the country whereof I have been a subject, and that I have resided within the United States for five years last past, and in this State for one year last past.

Subscribed and sworn to in open Court }
 this.....day of.....18.... }

.....Clerk.

Hudson's Bay Company's Lands.

Sections No. 8 and No. 26 in every township are Hudson's Bay Company's lands, and all settlers must be careful not to enter upon them before they have acquired them from the Company. The prices vary according to locality. Mr. C. J. Brydges is the Land Commissioner of the Company. His official residence is at Winnipeg, Manitoba, and applications may be made to him. Under agreement with the Crown the Hudson Bay Company are entitled to one-twentieth of the lands in the fertile belt, estimated at about seven million of acres.

School Lands.

Sections No. 11 and 29 in every township are School Lands. That is, the proceeds from their sale are to be applied to the support of education. They are not attainable at private sale. When disposed of it will be at public competition by auction. All squatters on those lands, therefore, will have to pay for them the price they bring by auction when sold, or they will pass by that sale out of their hands.

Lands at Private Sale.

The settler may sometimes find it convenient to buy lands, partially improved, with buildings and fences upon them at private sale. It very frequently happens that Half-breed or other lands may be obtained on moderate terms.

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CHAPTER XXXVI.

Statistics.

Population of the Dominion in 1881 as Compared with that of 1871—Population of the
Cities and Towns—Place of Birth—Religious Belief—Areas of the Provinces, etc.

THE purpose of the following chapter is to give in an epitomised form the statistics of the Dominion, commencing with the population, showing the nationalities and religions of the inhabitants, as well as the areas of the different provinces; together with a table of all cities and towns having a population of over 5,000, and such other information as could be put into the limited number of pages at our disposal.

TOTAL POPULATION OF THE DOMINION.

Census of 1861.....	3,090,561
" 1871.....	3,485,761
" 1881.....	4,324,810

POPULATION BY PROVINCES.

	1881.	1871.
Ontario	1,923,228 ..	1,620,851
Quebec	1,359,027	1,191,516
New Brunswick	321,233	285,594
Nova Scotia	440,572	387,800
Prince Edward Island.....	108,891 .	94,021
Manitoba.....	65,954	12,228
British Columbia.....	49,459	10,586
The North-West Territories ..	56,448 .	.....

POPULATION OF CITIES AND TOWNS HAVING OVER 5,000
INHABITANTS IN 1881 COMPARED.

NAMES.	PROVINCES.	1871.	1881.
Montreal	Quebec.	107,225	140,747
Quebec	"	50,699	62,446
Toronto	Ontario.	50,092	80,415
Halifax	Nova Scotia.	20,582	30,100
St. John	New Brunswick.	28,805	26,127
Hamilton	Ontario.	20,710	35,901
Ottawa	"	21,545	27,412
London	"	15,826	19,746
Kingston	"	12,407	14,001
Brantford	"	8,107	9,616
St. Catharines	"	7,864	9,631
Three Rivers	Quebec.	7,570	9,206
Belleville	Ontario	7,305	9,516
Guelph	"	6,878	9,800
Lévis	Quebec.	6,691	7,597
Fredericton	New Brunswick.	6,006	6,218
Chatham	Ontario.	5,873	7,873
Sorel	Quebec.	5,636	5,701
Port Hope	Ontario.	5,114	5,585
Brockville	"	5,102	7,009
Peterborough	"	4,611	6,812
St. Jean Baptiste	Quebec.	4,408	5,874
Stratford	Ontario.	4,313	8,230
Windsor	"	4,253	6,561
Lindsay	"	4,040	5,080
Woodstock	"	3,082	5,373
Galt	"	3,827	5,187
St. Hyacinthe	Quebec.	3,746	5,321
St. Thomas	Ontario.	2,197	8,367
Hull (city)	Quebec.	.....	6,890
Moncton (town)	New Brunswick	.....	5,321
Winnipeg (city)	Manitoba.	241	7,085
Victoria (city)	British Columbia.	3,270	5,925
Portland	New Brunswick.	12,520	15,226
Charlottetown	Prince Edward Island	8,807	11,485
Sherbrooke	Quebec.	4,432	7,227
St. Henri .....	"	....	6,415

Table I.—ORIGINS OF THE PEOPLE.

In this table will be found only those claiming origin from English, Scotch, Irish, French, German, or Indian parentage. All others will be excluded as not necessary to our present purpose.

OVER 5,000

POPULATION BY PROVINCES.

PROVINCES.	ENGLISH.	SCOTCH.	IRISH.	FRENCH.	GERMAN.	INDIAN.
Ontario	535,835	378,536	627,262	102,743	210,557	15,325
Quebec.....	81,515	54,023	123,749	1,073,820	9,719	7,515
New Brunswick.....	93,387	49,829	101,284	56,635	10,083	1,401
Nova Scotia.....	128,986	146,027	66,067	41,219	42,262	2,125
Prince Edward Island.	21,414	48,933	25,415	10,751	1,368	281
Manitoba.....	11,503	16,506	10,173	9,049	9,158	6,767
British Columbia.....	7,297	3,892	3,172	916	952	25,061
The N. W. Territories.	1,374	1,217	281	2,896	32	49,472
Totals.....	881,311	699,863	957,403	1,298,929	284,731	108,547

POPULATION OF CITIES AND TOWNS OVER 5,000.

CITIES.	ENGLISH.	SCOTCH.	IRISH.	FRENCH.	GERMAN.	NEGROES.	TOTAL.
Montreal	16,407	12,531	28,995	78,684	1,476	71	140,747
Quebec.....	3,437	1,683	10,224	46,444	263	7	62,446
Toronto	34,008	13,754	32,177	1,230	2,212	593	86,415
Halifax	11,707	6,540	12,814	938	2,292	1,039	36,100
St John.....	8,499	3,343	12,863	239	503	315	26,127
Hamilton	13,559	7,716	10,787	500	2,306	505	35,916
Ottawa.....	4,895	2,022	9,593	9,384	353	14	27,412
London.....	8,017	3,543	6,062	223	430	261	19,746
Portland	3,679	2,077	8,448	124	370	84	15,226
Kingston.....	4,039	1,932	7,089	480	377	73	14,091
Charlottetown.....	3,716	3,166	4,059	215	441	83	11,485
Brantford	4,081	1,668	2,658	133	584	175	9,616
St. Catharines...	2,534	1,342	3,804	189	829	336	9,631
Three Rivers....	288	256	182	8,537	46	....	8,670
Belleville.....	3,482	1,136	3,384	545	868	8	9,516
Guelph.....	3,866	2,434	2,810	82	517	107	9,890
Lévis.....	290	147	431	6,681	10	9	7,597
Fredericton.....	1,934	987	2,690	82	226	162	6,218
Chatham.....	2,594	1,256	1,607	583	361	781	7,873
Sorel.....	163	82	90	5,427	9	....	5,791
Port Hope.....	2,606	564	2,146	94	162	....	5,585
Brockville.....	1,842	987	3,665	456	269	....	7,699
Peterborough...	1,948	1,156	2,952	624	100	1	6,812
Sherbrooke....	1,774	612	799	3,957	17	2	7,227
St Jean Baptiste.	178	114	193	5,334	35	....	5,874
Stratford.....	2,954	1,849	2,773	64	436	26	8,239
Windsor.....	2,066	884	1,261	811	413	995	6,561
Lindsay.....	1,174	599	2,740	316	202	9	5,080
Woodstock.....	2,544	1,768	671	52	205	42	5,373
Galt.....	1,294	2,634	764	28	423	13	5,187
St Hyacinthe...	64	41	58	5,089	8	....	5,321
St. Thomas.....	3,798	1,723	1,972	128	503	58	8,367
Hull.....	257	259	371	5,933	49	..	6,890
Moncton.....	2,251	1,169	967	363	158	8	5,032
Winnipeg.....	2,352	2,470	1,864	450	191	4	7,985
Victoria.....	2,318	917	831	145	332	137	5,925
St Henri.....	326	174	346	5,519	22	1	6,415

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ORIGINS OF THE PEOPLE.

ORIGINS.	ONTARIO.	QUEBEC.	NOVA SCOTIA.	NEW BRUNSWICK.	PRINCE EDWARD ISLAND.	MANITOBA.	BRITISH COLUMBIA.	N. W. TERRITORIES.	TOTALS.
African.....	13,097	141	7,062	1,638	155	25	274	2	21,394
Chinese.....	22	7	.....	.....	.....	4	4,350	.....	4,383
Dutch.....	22,163	776	2,197	4,373	292	506	94	11	30,412
English.....	535,835	81,515	128,986	93,387	21,404	11,503	7,297	1,374	881,301
French.....	102,743	1,073,320	41,219	56,635	10,751	9,949	916	2,896	1,298,929
German.....	188,394	8,943	40,065	6,310	1,076	8,652	858	21	254,319
Icelandic.....	57	.....	179	.....	.....	773	.....	.....	1,009
Indian.....	15,325	7,515	2,125	1,401	281	6,767	28,661	49,472	108,547
Irish.....	627,262	123,749	66,067	101,284	25,415	10,173	3,172	281	957,403
Italian.....	687	745	153	59	21	41	143	.....	1,849
Jewish.....	254	330	32	22	.....	18	11	.....	667
Russian and Polish.....	787	300	30	26	12	24	48	.....	1,227
Scandinavian.....	1,521	648	556	932	38	250	236	33	4,214
Scottish.....	378,536	54,823	146,027	49,829	48,933	16,506	3,892	1,217	699,863
Spanish and Portuguese.....	285	175	350	203	1	14	144	.....	1,172
Swiss.....	2,382	254	1,860	41	1	10	40	.....	4,653
Welsh.....	6,397	351	1,158	1,474	164	103	299	1	9,947
Other Origins.....	1,213	730	165	94	40	6	342	190	2,780
Not Given.....	27,268	4,105	2,341	3,525	307	630	1,682	948	40,806

Jewish.....	227	300	26	12	24	48	.....	1,221
Russian and Polish.....	787	556	932	38	250	236	33	4,214
Scandinavian.....	1,521	648						689,863
Scottish.....	378,536	54,923	49,829	48,933	16,506	3,892	1,217	1,172
Spanish and Portuguese.....	285	175	203	1	10	144	.....	4,583
Swiss.....	2,382	254	1,860	41	103	40	.....	9,947
Welsh.....	6,397	351	1,158	164	103	299	1	9,947
Other Origins.....	1,213	730	94	6	342	342	190	2,780
Not Given.....	27,268	4,105	3,525	307	630	1,682	948	40,806

Table II.—RELIGIONS OF THE PEOPLE.

In this Table I group together all Baptists, Methodists, and Presbyterians, and take a column for each. Pagans and those of no religion I place in the sixth column.

RELIGIONS BY PROVINCES.

PROVINCES-	English.	Presby'ians	Methodists.	R.Catholics	Baptists.	No Religion
Ontario	366,539	417,749	592,103	320,839	106,680	3,225
Quebec	68,797	50,287	39,221	1,170,718	8,853	438
New Brunswick	40,768	42,888	34,544	109,091	81,092	116
Nova Scotia	60,255	122,488	50,811	117,483	83,761	121
Prince Edward Isla'd	587	8,395	1,686	13,794	1,713	14
Manitoba	14,297	14,262	9,470	12,246	9,449	2,189
British Columbia	7,804	4,015	3,516	10,043	434	617
N. W. Territories	3,166	531	461	4,443	20	362

RELIGIONS OF CITIES AND TOWNS OVER 5,000.

NAMES.	English.	Presby'tians	Methodists.	R Catholics	Baptists.	No Religion
Montreal	14,338	11,597	5,327	103,579	1,402	39
Quebec	3,328	1,344	883	56,255	174	5
Toronto	30,913	14,612	16,357	15,716	3,667	59
Halifax	9,332	4,992	3,711	14,705	2,704	8
St. John	5,980	3,554	3,287	8,701	3,737	3
Hamilton	9,605	7,879	8,317	7,134	1,066	69
Ottawa	4,825	3,059	2,173	15,901	461	30
London	6,502	3,257	4,952	3,284	885	2
Portland	3,756	1,872	1,795	4,600	1,856	1
Kingston	3,815	2,600	2,398	4,451	200	3
Charlottetown	1,670	2,197	2,604	4,384	472	..
Brantford	2,023	1,467	2,481	1,471	1,570	2
St. Catharines	2,439	1,474	2,217	2,582	627	23
Three Rivers	101	209	68	8,831	699	..
Belleville	2,343	1,490	3,229	2,164	115	1
Guelph	1,901	2,422	2,442	1,895	482	1
Lévis	230	98	71	7,185	7	..
Fredericton	1,555	822	993	1,621	1,189	2
Chatham	1,804	1,181	2,498	1,506	729	1
Sorel	130	49	17	5,526	....	..
Port Hope	1,891	972	1,765	603	330	3
Brockville	2,175	1,382	1,591	1,954	360	16
Peterborough	1,375	1,431	1,845	1,887	256	..
Sherbrooke	1,270	482	481	4,511	63	..
St. Jean Baptiste ..	89	103	42	5,596	9	..
Stratford	2,354	2,087	1,394	1,549	417	1
Windsor	1,635	693	1,746	1,878	264	..
Lindsay	1,207	674	1,273	1,643	215	15
Woodstock	1,303	1,680	1,388	302	647	2
Galt	781	2,632	862	528	236	15
St. Hyacintho	46	68	3	5,165	11	7
St. Thomas	1,995	1,466	2,431	952	1,065	3
Hull	263	155	118	6,234	79	..
Moncton	637	1,038	875	976	1,357	..
Winnipeg	2,373	2,365	1,370	1,020	349	1
Victoria	1,720	908	705	866	114	179
St. Henri	179	169	86	5,920	28	..

RELIGIONS OF THE PEOPLE.

RELIGIONS.	ONTARIO.	QUEBEC.	NOVASCOTIA.	NEW BRUNSWICK.	PRINCE-EDWARD ISLAND.	MANITOBA.	BRITISH COLUMBIA.	NORTH-WEST TERRITORIES.	TOTAL.
Adventists.....	696	4,210	1,536	738	13	8	10	.....	7,211
Baptists.....	38,948	5,988	73,149	49,489	5,588	1,638	424	12	235,236
Freewill, &c.	4,274	2,865	10,612	31,613	648	35	10	8	50,055
Methodists, &c.	13,458	.....	.....	.....	.....	7,776	.....	.....	21,234
Brethren.....	7,714	.....	.....	.....	.....	29	.....	.....	8,831
Roman Catholics.....	320,839	1,170,718	117,487	109,091	47,115	12,246	10,043	4,443	1,791,982
Church of England.....	366,539	68,797	60,255	1,372	7,192	14,297	7,804	3,166	574,818
Congregational.....	16,340	5,244	3,506	1,476	20	343	75	.....	26,900
Disciples.....	16,051	121	1,896	1,476	594	102	23	.....	20,193
Reformed Episcopal.....	989	423	99	478	13	1	583	.....	2,596
Jews.....	1,193	869	19	55	.....	33	104	.....	2,393
Lutherans.....	37,901	1,003	5,639	324	4	984	491	.....	46,350
Congregational Methodists.....	436,987	38,026	50,214	34,802	11,052	8,508	3,416	463	582,963
Episcopal.....	101,505	739	148	152	21	641	73	3	103,272
Bible Christians.....	23,726	357	436	43	2,403	257	14	.....	27,236
Primitive Methodists.....	25,555	42	2	9	.....	64	8	.....	25,680
Other Methodists.....	3,730	67	11	8	.....	.....	.....	.....	3,830
Pagans.....	1,499	6	.....	2	.....	.....	437	361	4,478
Congregational Presbyterians.....	402,572	45,651	94,760	39,103	29,304	2,173	3,488	475	629,260
Church of Scotland.....	7,964	3,246	15,567	1,626	4,004	63	330	34	32,834
Reformed Presbyterians.....	6,912	1,034	2,150	2,136	103	277	251	22	12,945
Other Presbyterians.....	301	856	11	24	304	24	26	.....	1,106
Protestants.....	2,918	2,432	15	50	15	45	292	692	6,519
Quakers.....	6,307	86	77	21	5	43	13	1	6,553
Unitarians.....	1,213	610	68	140	16	20	54	5	2,136
Universalists.....	1,333	2,021	673	375	73	8	29	.....	4,517
Other Denominations.....	10,983	284	355	311	139	68	2,128	1	14,289
No Religion.....	1,756	432	121	114	14	16	180	1	2,654
Not Given.....	12,965	2,668	1,618	1,260	100	2,327	19,131	46,760	86,709

Table III.—BIRTH PLACES OF THE PEOPLE.

Church of Scotland.....	6,912	1,034	2,150	2,136	163	277	251	22	12,945
Reformed Presbyterians.....	371	356	11	24	364	24	26	.....	1,106
Other Presbyterians.....	2,918	2,432	15	50	15	45	292	692	6,519
Protestants.....	6,307	86	77	21	15	43	13	1	6,533
Quakers.....	1,213	610	68	140	16	20	54	5	2,126
Unitarians.....	1,213	810	68	140	16	20	54	.....	4,517
Universalists.....	1,333	2,021	673	375	78	8	29	.....	14,269
Other Denominations.....	10,983	284	355	311	139	68	2,139	1	2,634
No Religion.....	1,756	432	121	114	14	16	130	1	2,634
Not Given.....	12,965	2,608	1,618	1,260	100	2,327	19,131	46,760	86,709

BIRTH PLACES.	ONTARIO.	QUEBEC.	NEW BRUNSWICK.	NOVA SCOTIA.	P. E. ISLAND.	MANITOBA.	BRITISH COLUMBIA	N.W. TERRITORIES	TOTALS.
England and Wales.....	139,031	12,909	4,174	4,813	1,728	3,457	3,294	98	169,504
Ireland.....	130,094	27,379	16,355	5,600	2,915	1,836	1,235	62	185,526
Scotland.....	82,173	10,237	4,168	10,858	3,425	2,868	1,204	136	115,062
Prince Edward Island.....	686	586	2,719	1,639	95,234	154	23	6	101,047
Nova Scotia.....	3,706	813	6,160	405,637	2,507	820	379	16	420,088
New Brunswick.....	2,801	1,272	277,643	4,482	1,346	341	374	6	238,265
Quebec.....	50,407	3,127	3,127	441	177	4,085	366	101	1,327,809
Ontario.....	1,435,647	103,79	310	333	105	19,125	1,572	517	1,457,888
Manitoba.....	62	33	1	.....	.....	18,020	24	1,450	19,590
British Columbia.....	42	19	2	6	.....	25	32,175	5	32,275
North-West Territories.....	158	48	2	1	.....	6,422	14	51,785	58,430
Other British Possessions.....	2,606	1,490	436	2,575	746	72	211	7	8,143
France.....	1,549	2,239	63	222	15	81	193	27	4,389
Germany.....	23,270	1,023	203	254	14	220	344	.....	25,828
Italy.....	378	231	22	36	9	23	78	.....	777
Russia.....	444	231	6	10	2	5,651	32	.....	6,376
Spain and Portugal.....	103	50	14	23	1	1	23	.....	215
S. N. and Denmark.....	852	358	444	114	11	121	170	6	2,076
United States.....	45,454	19,415	5,108	3,004	609	1,752	2,295	116	77,753
Other Countries.....	1,293	545	52	166	11	771	4,611	1	7,455
At Sea.....	256	30	23	45	8	7	11	.....	380
Not Given.....	2,211	665	200	270	28	102	751	2,107	6,334
Totals.....	1,923,228	1,359,027	321,233	440,572	108,891	65,95	49,459	56,446	4,324,810

Table IV.—AREAS OF PROVINCES.

PROVINCES.	SQUARE MILES.	ACRES.
Ontario.....	101,733	65,111,463
Quebec.....	188,688	120,764,651
Nova Scotia.....	20,907	13,382,003
New Brunswick.....	27,174	17,393,410
Prince Edward Island.....	2,133	1,365,400
Manitoba.....	123,200	78,848,040
British Columbia.....	341,305	218,435,200
North-West Territories.....	2,665,252	1,705,761,280
Total.....	3,470,392	2,221,061,447

Table V.—DWELLINGS.

NAMES.	TEMPORARY.		HOUSES.			TOTAL OCCUPIED.
	VESSELS.	ARTIES.	IN- ABITED	UN- INHABITED	BEING BUILT.	
Ontario.....	43	1,216	358,034	19,649	3,145	359,293
Quebec.....	6	314	216,112	18,469	2,887	216,432
Nova Scotia.....	33	385	73,736	2,897	1,234	74,154
New Brunswick.....	11	199	50,956	2,397	901	51,196
Prince Edward Island.....	4	35	17,635	607	328	17,724
Manitoba.....	2	461	12,400	796	1,136	12,803
British Columbia.....	16	2,785	6,992	1,738	151	9,793
North-West Territories	1	5,357	2,294	30	100	11,652
Total.....	116	14,692	738,209	46,583	9,882	753,017

ACRES.
65,111,463
120,764,651
13,382,003
17,393,410
1,365,400
78,848,040
218,435,200
1,705,761,280
2,221,061,447

BRING BUILT.	TOTAL OCCUPIED.
3,145	359,293
2,887	216,432
1,234	74,154
901	51,196
328	17,724
1,136	12,803
151	9,793
100	11,652
9,882	753,017

Table VI.—FAMILIES, POPULATION, SEXES, CONJUGAL CONDITION.

	ONTARIO.	QUEBEC.	NOVA SCOTIA.	NEW BRUNSWICK.	PRINCE EDWARD ISLAND.	MANITOBA.	BRITISH COLUMBIA.	NORTH-WEST TERRITORIES.	TOTAL.
Families.....	386,444	254,841	79,596	56,948	17,973	14,169	10,439	11,726	312,136
Population.....	1,923,228	1,359,027	440,572	321,338	108,891	65,954	49,459	56,446	4,324,810
Males. } Females. }	976,470 946,758	678,175 680,852	220,538 220,034	164,119 157,114	54,729 54,162	37,207 28,747	29,503 19,336	28,113 23,833	2,188,854 2,135,956
Males. } Females. }	309,561 309,476	218,544 217,799	67,761 67,893	49,361 49,342	15,363 15,399	10,948 10,543	8,495 7,326	10,511 11,762	690,544 689,540
Total. } Males. } Females. }	619,037 22,189 49,136	436,343 16,966 31,991	135,654 4,880 13,211	98,703 4,312 8,384	30,762 1,242 2,848	21,491 530 919	15,821 714 1,127	22,273 162 1,819	1,380,084 50,895 109,403
Total. } Males. } Females. }	71,325 644,720 588,143	48,937 442,665 431,062	18,091 147,897 138,930	12,596 110,546 99,388	4,090 88,123 35,916	1,449 23,729 17,285	1,841 10,294 11,503	1,981 17,440 14,752	160,830 1,447,414 1,136,982
Total. } Males. } Females. }	1,232,866 588,143 644,720	873,727 431,062 442,665	286,827 138,930 147,897	209,934 99,388 110,546	74,039 35,916 88,123	43,014 17,285 23,729	31,797 11,503 10,294	52,192 14,752 17,440	2,784,396 1,136,982 1,447,414

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