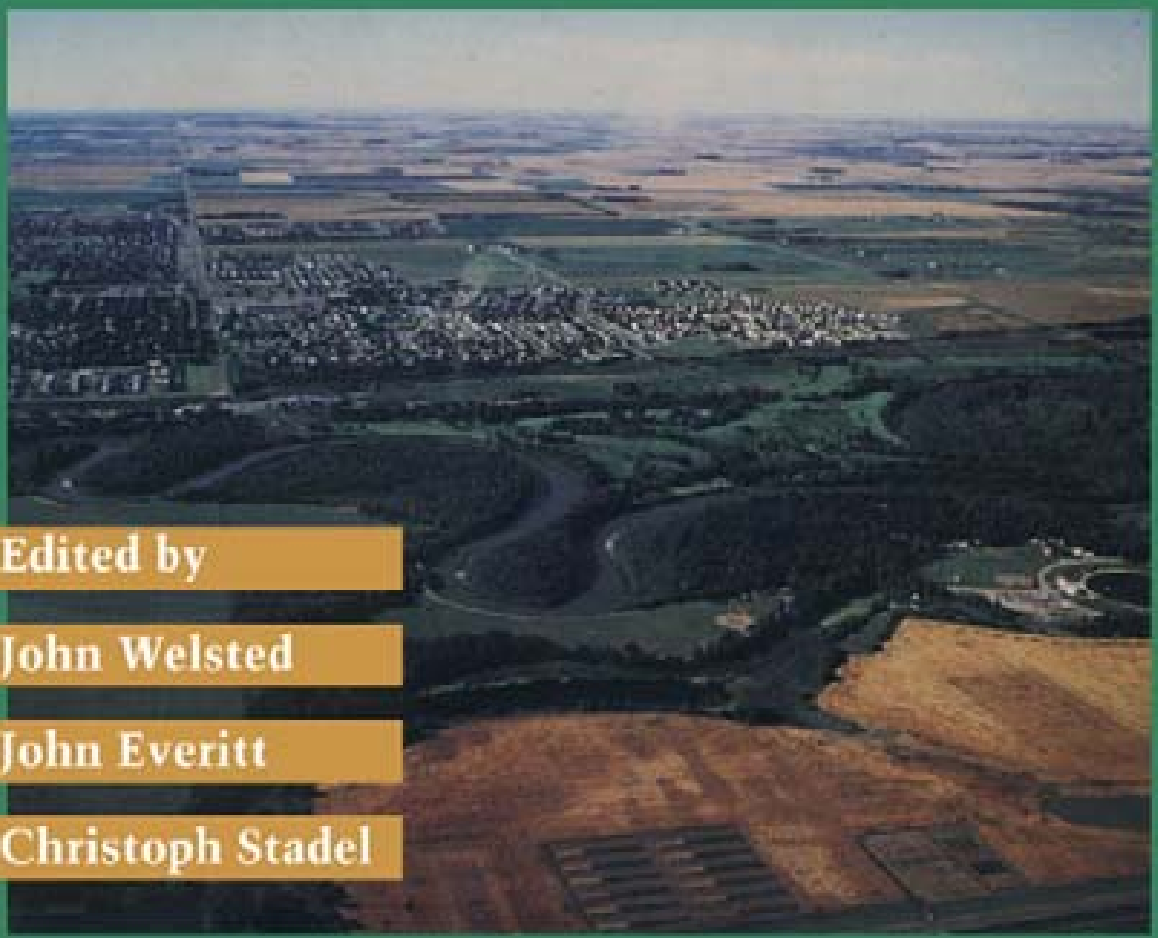
THE GEOGRAPHY OF MANITOBA

ITS LAND AND ITS PEOPLE



Edited by
John Welsted
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This book is dedicated to Brian Evans, John Tyman, and Tom Weir, pioneers of geography teaching at Manitoba's universities.

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FOREWORD

John Warkentin

Manitoba is situated in the relatively level centre of the North American continent. In that interior location, does the province have edges? Does it have differentiating geographical characteristics that are significant in the development and geography of Canada? The maps and landscapes of the province reveal that it does. From them, it is evident that within Canada, Manitoba is a land of great natural dividing lines. In 1801 Sir Alexander Mackenzie, the first man known to have crossed the North American continent north of the Rio Grande, made one of the profound generalizations of Canadian geography, in what is the first printed reference to the great extent of what we now know as the Canadian Shield. In his book describing his explorations, he stated that dark-grey rocks extend eastward from Lake Winnipeg all the way to the coast of Labrador, and that the soft, nearly horizontal limestone rocks of the plains stretch westward. This critical division within Canada can be carried forward to other fundamental aspects of the present-day landscape and geography. When you drive westward through northern Ontario, you are in rugged Shield country, your horizon closely bounded by forests. Then at Richer in eastern Manitoba, at a dazzling white beach ridge of former Lake Agassiz, the black earths of the plains open endlessly before you and your head spins from a new sense of space. Moreover, there is a significant change in vegetation west of Lake of the Woods, as eastern species of trees give way to those of the west and then to the grasslands. In Manitoba, you enter a new world — the Prairies.

The great map-maker and geographer David Thompson, a contemporary of Alexander Mackenzie, made his own astute observations on the overall geography of Canada when he referred to the chain of lakes trending from Lake Superior and Lake of the Woods through Lakes Winnipeg and Manitoba and onward far to the north and west to Great Slave Lake. Within Manitoba, great bodies of water, aligned along north-south axes parallel to the line of the Shield and the Manitoba Escarpment, are some of the province's most distinctive features. They receive large rivers from west, south, and east, the Saskatchewan, Red/Assiniboine, and Winnipeg, and send their waters to that large inland sea, Hudson Bay, by the Nelson. The lakes were exceedingly important in the early development of what was to become Manitoba; they were vital nodes of travel for Aboriginal people, fur traders, and the first large migration of colonists. The latter were the Selkirk settlers, who came to the prairies at Red River by Hudson Bay, the Hayes River, and Lake Winnipeg. For a long time the lakes were a means of "bringing together" travellers in the centre of the continent, yet it is strange that no great cities were founded on any of the Manitoba lakes, in contrast to elsewhere in Canada. However, this is not so odd when one looks at the new transportation infrastructure, which gradually changed the face of Manitoba. The Red River cart connection to Saint Paul certainly affected the operations of the nineteenth-century Hudson's Bay Company fur trade, particularly the trade route to Hudson Bay and England through York Factory, which was eventually phased out. But the real transformation in space relations that shifted movement and development from north-south to east-west lines was the building of the Canadian Pacific Railway. And it is on the railways that the cities of Winnipeg, Portage la Prairie, and Brandon developed, together with many smaller towns. They were gateways to the surrounding agricultural lands. Settlers always bring their cultures with them, and many places, especially Winnipeg, still have vestiges of townscapes that are reminiscent of turn-of-the-nineteenth-century towns in Ontario from which so many entrepreneurs came.

People shape the geography of a region, and through a few individuals who were significant in the development of Canada we can identify some important characteristics of the cultural geography of the province. Louis Riel is representative of the early cultures of this region, societies founded upon hunting and a life of movement, which were confronted by a Euro-Canadian society based upon commercial agriculture fixed on a particular piece of land. In the course of the resulting clashes the province of Manitoba was created, and Riel is now recognized as a founder of the province. Winnipeg was a reception centre for immigrants during the period of greatest immigration Canada has ever experienced, an exciting time for the country and also one of deep personal anxiety for many newcomers. The adaptation of settlers to the new land was not easy, and J.S. Woodsworth's mission in North Winnipeg was a vital social agency in helping immigrants in the new land before the modern welfare state was created. To grow up within a French Canadian minority group in Manitoba, striving to maintain your culture, is a story sharply delineated in Gabrielle Roy's autobiography, differing from the experiences of other small groups because there was always the hope of the cultural support of Quebec, a distant place within your country where your roots were. Margaret Laurence illuminates the complexities of life in small communities everywhere, and the delicate, sometimes raging relations between different generations

and cultural groups. Cultural adjustments always have to be made as new immigrants continue to arrive, as is happening today in the cities, but an important and immensely encouraging indication of what happens in the long run is that the descendants of immigrants who had arrived at the beginning of this century from many different parts of Europe were by mid-century assuming roles as leaders in a democratic society in the wider Manitoba community.

All these social changes took place in the dominantly commercial agricultural society of southern Manitoba, in an infrastructure of railways, roads, and trading towns with their public institutions. Yet there are those natural dividing lines, and two fundamentally contrasting Manitobas, the south and the north, the cultivated and the wild. In the Shield the wilderness remains dominant, with Aboriginal communities and a few resource towns widely scattered here and there. In the 1920s, airplanes began to provide rapid communications for people, but after the 1940s, Svein Sigfusson pioneered the development of winter roads to these distant communities, making it possible to transport materials for better houses and public facilities more cheaply, as well as fuel for heating and generating electricity. However, the sometimes tragic meeting of different cultures is still working itself out, one of the most profound dilemmas in Canadian society. New Aboriginal leaders are appearing; the battle to fight for land claims and local self-government is under way, and should lead to better economic opportunities and living conditions and the renewal of what have become marginalized, often shattered, communities.

Landscapes, within the context of the natural environment, reflect the histories of the societies that produce them. Nowhere else in Canada will you find such an extensive, uncompromising, flat surface as the Lake Agassiz plain. This is where the carefully tended shelter belts oriented to the rectangular survey system are so vital in creating comfortable farmsteads, anchoring people within the relentless space about them. Much of the western part of southern Manitoba above the Manitoba Escarpment is graceful parkland on rolling glacial till plains, the farmsteads fit naturally into bluffs and slopes, and the protective softening hand of humans is not so absolutely necessary as on the lake plains. In most communities there is a serious appreciation of community history, recording pioneer life, but this is increasingly a written record because the old houses, barns, and even churches, which reproduced the styles of the homelands, are disappearing. Prairie trading towns are distinctive in their rigid orientation to the railway tracks. The compactness of Ontario main streets was brought here, and in some instances the characteristic two-storey brick commercial structures, though usually in a plainer style. It is in Winnipeg that you must seek the intriguing townscapes and architecture of the pioneer years, in a few ornamented brick business blocks of the 1870s, but more so in the big stone and brick wholesale warehouses of a few decades later when Winnipeg was the commercial gateway and emporium of the West. In the Aboriginal communities of the Shield to the north, which are always on rivers or lakes, the sense of the camp remains, of being ready to go out on the land into the surrounding bush. In contrast, the old resource towns of the Shield were planted foursquare, with breaks in the grid only where absolutely necessary at rock outcrops. However, modern northern communities are planned more flexibly; they often seem like southern residential suburbs deposited in the north.

Geography is dynamic, and any region's interrelationships with other areas change through time. At the beginning of the twentieth century, Winnipeg had a commanding position in the West, overshadowing other prairie cities to the west and vying with Vancouver for supremacy. But the development of the oil and gas industry propelled Edmonton and Calgary forward, and the thrust of the Pacific rim has assisted the sustained growth of Vancouver, ending Winnipeg's dominance. It remains a fascinating, important regional centre in mid-Canada, now taking more and more of its urban significance and assurance in the country from its creative population and their cultural contributions. It has a rich heritage to draw on.

Manitoba's crossroads location within Canada is and always will be geographically significant. In this large region of natural dividing lines and integrating human forces there are great inherent contrasts and variety, and the authors of this splendidly comprehensive book provide basic geographical descriptions and incisive interpretations of the natural, economic, social, and cultural aspects of Manitoban geography.

PREFACE

We first thought of this book in 1989; it was to be a long-term project aimed at producing a volume in 1995 to coincide with Manitoba's 125th anniversary. At the time, although much information was available in specialized journals, there was no readily accessible, comprehensive account of the geography of Manitoba, and we aimed to fill the gap. We thought it appropriate to aim the volume at second-year university level, at people who had some background in geography but who were not specialists. By doing so, we reasoned, the volume would be comprehensible by the interested general public.

Our first step was to list the topics to be covered and then to identify authors who could write articles on the topics. We decided to adopt the format of chapters and case studies, with chapters presenting a comprehensive coverage of a specific theme and case studies presenting detail of some of the topics related to material in the chapters. Most of the potential authors we identified work at the three Manitoba universities, many of them regularly attending the annual meetings of the Prairie Division of the Canadian Association of Geographers. Thus, to some extent, this book can be regarded as a joint project of Manitoba's universities. But there were gaps, and to cover these we had to approach people at other universities and several people employed elsewhere.

The result is a book that covers most aspects of the geography of Manitoba, although there are one or two obvious gaps — in some cases because potential authors had prior commitments or because more pressing commitments developed as the book progressed and they had to drop out of the project. Where possible, these gaps were filled by others, but this was not always possible. We have tried to allow each chapter and case study to stand in its own right, and within reason we have allowed each author to adopt his or her own style. The authors responded to our editorial comments usually with good humour, and we are indebted to them for agreeing to write articles even though in the early stages there was no guarantee that the volume would be published.

At an early planning stage, we decided we wanted a book that was well illustrated by maps and diagrams. We were fortunate that Weldon Hiebert, cartographer at the University of Winnipeg, agreed to prepare them for us. Weldon is responsible for all the maps and diagrams, except for Figure 3.1.1, which was drawn by Marjorie Halmarson of the University of Manitoba. Also, Figures 17.1, 17.2, 17.3, 17.4, and 17.5 are from originals drawn by Marjorie; and figures 11.1 and 11.5 are from originals drawn by W. Gruber, University of Salzburg. Figures 14.7, 14.8, 14.10, 14.11, 14.12, 14.13, and 14.1.1 are from originals drawn by Patrick Cherneski, University of Regina. All the maps and diagrams have been carefully edited by Brian McGregor, University of Winnipeg.

Even though articles were originally submitted on computer disks, the manuscript has involved a great deal of additional word processing. Much of the early work was done by Judy Ramsay and Shirley Slashinsky, secretaries in the Faculty of Science, Brandon University, and by Kathie Welsted. In the finishing stages, the word processing for the whole volume was done by Christine Sharpe, secretary, WESTARC Group Inc., Brandon University. We are greatly indebted to all four for their help with this project.

Proof-reading and copy-editing are time consuming and skill-testing tasks. In this regard we are indebted to Terry Mitchell, Director of Library Services, Brandon University, who did a copy-edit of the penultimate version of the volume for us, and to Frank Chow and Carol Dahlstrom for copy-editing the final version. The volume has been improved by the adoption of a number of changes suggested by two anonymous reviewers and by Patricia Dowdall, former Director, University of Manitoba Press. We also wish to acknowledge the support of David Carr, Director of the University of Manitoba Press, and Allison Campbell, Promotion Coordinator, in bringing this project to fruition. Despite all this help, any deficiencies are, of course, ours.

Publishing in the 1990s is expensive. We acknowledge the financial support of the Government of Canada through the Canadian Studies Program, Department of Canadian Heritage, which enabled us to reach the publication stage. Roger Smith, Dean of Science, Brandon University, and Shari Decter-Hirst, Executive Director, Development and External Relations, Brandon University, identified potential sources of funding for us, and we are grateful to the Thomas Sill Foundation Inc., Winnipeg, to Inco Limited, Manitoba Division, and to the Manitoba Telephone System, who provided funds that made publication possible. We are also grateful for financial support received from the following people and organizations: Behlen Industries, CANDO Contracting Ltd., CKXTV and Radio, Jeff and Pat Cristall, Crane Steel Structures Ltd., Ron Kille, Kelleher and Co., Manitoba Pool Elevators, Murray Chev Geo Olds Cadillac Ltd., Bill Robinson, Shur-Gro Farm Services Ltd., Jack and Diane Spalding, John Templeton, We Care Home Health Services. Finally, we wish to thank our wives, Kathie, Donna, and Christel, who have been extraordinarily patient and supportive of us during the long gestation period of "the book."

Plate 1 Flin Flon Creek, northeast of Flin Flon, flowing across Precambrian rocks. The area is typical of much of the southern part of the Canadian Shield, covered by a mixture of deciduous trees — without leaves at the time of the photograph — and dark green coniferous trees (H. Young).

Plate 2 A thick exposure of Cretaceous shales off highway 3, east of La Rivière. The exposure shows the nearly horizontal bedding of the shales and the rapid weathering of the shales once they are exposed (H. Young).

Plate 3 Mammatus clouds over southern Manitoba. These unusual clouds with downward bulges usually herald the approach of severe weather conditions, sometimes accompanied by tornadoes (J. Welsted).

Plate 4 Sun dogs (parhelia) with low sun near Vista. These phenomena occur at low temperatures as light is refracted as it passes through ice crystals (J.Everitt).

Plate 5 Raised beaches along the shore of Hudson Bay. The bay was depressed by the weight of the ice during the Pleistocene and has rebounded rapidly since the ice disappeared, leaving former shorelines as much as 200 km inland and up to 183 m above present sea level (T. Corkery).

Plate 6 The eroded edge of the Manitoba Escarpment at Wilson Creek, Riding Mountain. The Cretaceous shales that form the escarpment are seen in the right foreground where the slope is too steep to support vegetation. The rest of the escarpment is covered by the mixed-woods (coniferous and deciduous) of this area. In the background are the flat lowlands of the Westlake area, formerly covered by Lake Agassiz (J. Welsted).

Plate 7 Buffalo (Bison bison) *at Riding Mountain National Park. Before European settlement, buffalo roamed the whole of the North American Great Plains but have now been reduced to a few protected herds, mainly in national parks. Prairie grassland occupies the foreground and aspen woodland the background (J. Welsted).*

Plate 8 Loop-handled vessel from the Initial Middle Missouri Duthie site near Lauder, Manitoba. Spacing indicates a total of 8 handles, possibly indicating an orientation to the cardinal and semi-cardinal directions (B. Nicholson).

Plate 9 The village of Kenton, population approximately 200, is typical of many in southern Manitoba. The photograph is taken looking to the west, and shows highway 259 passing north of the village, and the now-abandoned route of the Great North West Central Line (the Lenore extension; Case Study 14.2 on page 217), which passed through the village. The elevators were located in the grass-covered area in the centre of the village. The hummocky terrain of the Minnedosa-Reston till plain can be seen in the background (Concord Aerial photo).

Plate 10 The end of the line. The Canadian National station at Churchill, the northernmost railway station in Manitoba. Grain for export is carried to Churchill along this line, and tourists arrive by VIA Rail. The future of the railway line and of the station is a matter of political debate (G. Sweet).

Plate 11 Bradwardine elevator, now closed. An old-style, red-painted Manitoba Pool elevator with annex. This elevator, which had a capacity of 57,500 bushels (approximately 1,610 tonnes), was located on the now-abandoned Great North West Central Line (the Lenore extension; Case Study 14.2 on page 217) (J. Everitt).

Plate 12 A new-style, yellow and white Manitoba Pool elevator at Tucker Siding, just east of Portage. This elevator, which has an exposed leg, opened in 1986, replacing older-style elevators at Portage. Capacity is 5,500 tonnes (J. Everitt).

Plate 13 The village of Reinland from the air, taken looking east-northeast. The village is located in section 13, township 1, range 4, within the west Mennonite reserve. In typical fashion, houses are located along the road with land holdings extending back from it (J. Richtik).

Plate 14 The Little Saskatchewan Valley, north of Minnedosa. The small misfit river, hidden by vegetation in the foreground, occupies a large valley created by glacial meltwater from Riding Mountain. Highway 10 crosses the valley on its way north to Dauphin. Flax (lavender coloured) and canola (yellow) are typical crops of this area (C. Stadel).

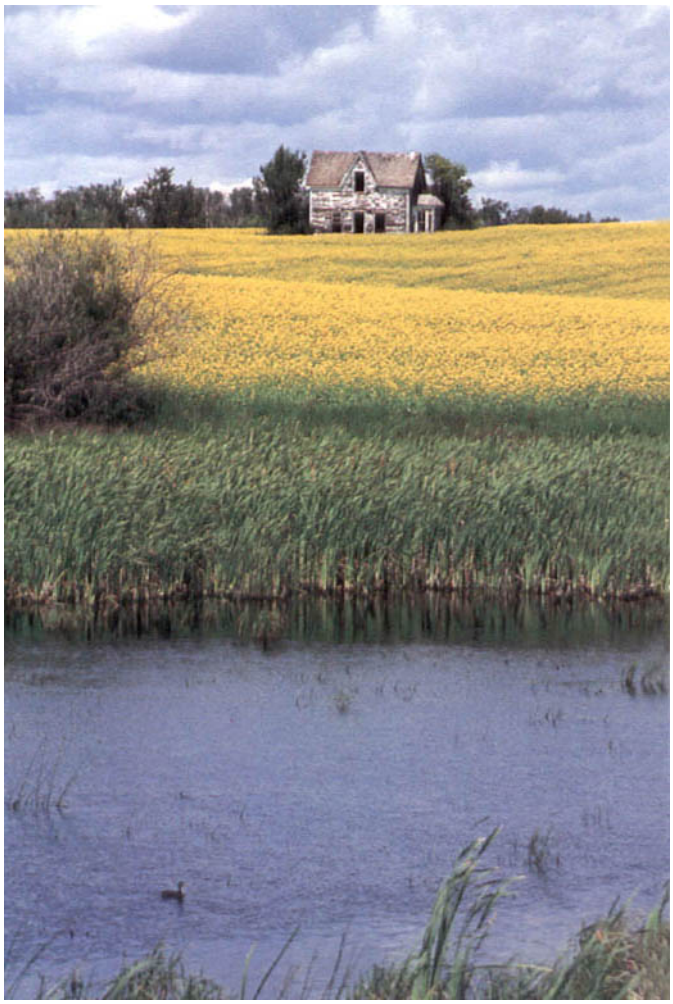

Plate 15 A typical scene in southern Manitoba, near Clanwilliam. The slough in the foreground is surrounded by sedges and reeds. Further back a field of canola surrounds an abandoned farm house (C. Stadel).

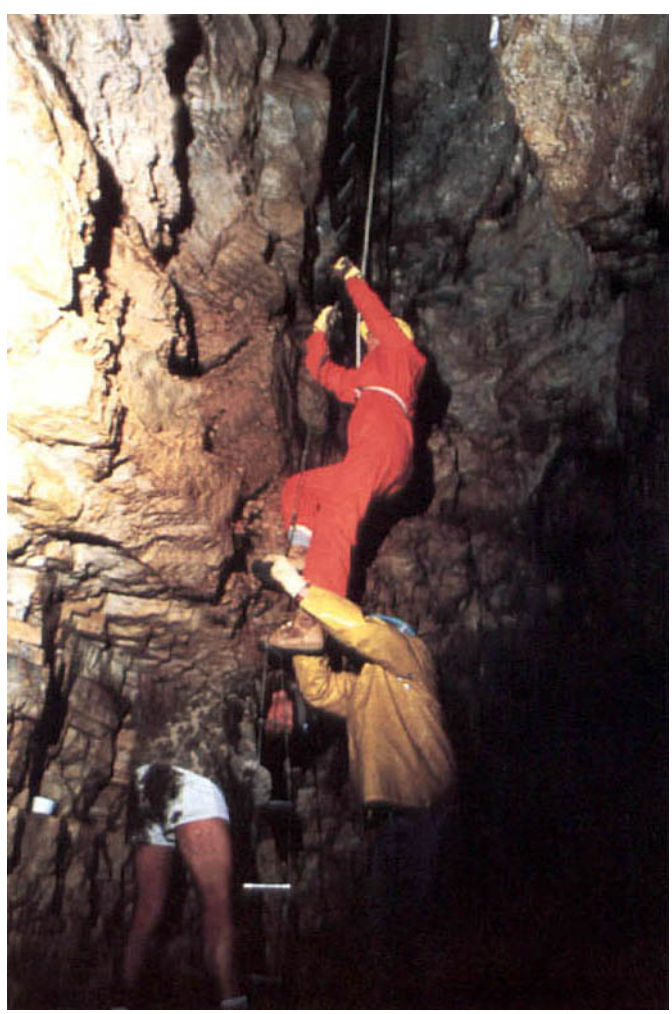

Plate 16 Speleologists in a vertical passage in a cave just north of Grand Rapids (G. Sweet).

THE GEOGRAPHY OF MANITOBA

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MANITOBA: GEOGRAPHICAL IDENTITY OF A PRAIRIE PROVINCE

1

John Welsted
John Everitt
Christoph Stadel

The Keystone Province: the name reflects the central position of Manitoba in the Canadian confederation as well as its shape, like the keystone of an arch wider at the top than at the bottom. With its southern boundary close to the centre of North America (located near Rugby, North Dakota), the province extends from 49°N (the latitude of Vancouver, Montreal, and Paris) to 60°N (the same level as the northern tip of Labrador, the southern part of Greenland, Oslo, and Saint Petersburg). Manitoba has artificial (geometric) boundaries with its neighbours, and the strength of its connections with them has varied considerably over time. Currently it has tenuous connections with the Northwest Territories, but strengthening relationships with the United States through the North American Free Trade Agreement (NAFTA), the General Agreement on Tariffs and Trade (GATT), and other agreements and policies. In some respects these north-south "borderland" connections are becoming more significant than the traditional east-west ties that made Manitoba an economically peripheral area to the "core" of southern Ontario and Quebec.

Manitoba is the sixth-largest province in Canada (649,950 km^2) and has the fifth-largest population (just over 1 million people). With an average population density of only 2.0 per km^2, it has a much lower density than France, which is of comparable size but which has a total population of 58 million. It is the most easterly of the Prairie provinces, yet much of its land surface is taken up by the Canadian Shield and over 15 percent of the area is water, including some very large lakes. Also, although it is regarded as a rural province by most outsiders and by many residents, most of Manitoba's population is urban. A fascinating range of geographical elements give the province a distinct identity, and help make it an area worthy of separate study.

In terms of location, climate, and ecological characteristics, Manitoba exhibits a marked continentality, with a climate resembling that of southwestern Siberia. Because of its access to Hudson Bay, Manitoba can also be classified as a maritime province (Figure 1.1). However, as the bay remains frozen for much of the year, winters in the adjacent regions are not significantly modified, and its transportation potential is restricted by the shortness of the summers and by a difficult overland link to the south through shield and muskeg topography. Despite this, Hudson Bay played a significant role during the initial period of European exploration and settlement of what is now Manitoba. The bay itself is of geologically recent origin, having emerged from a cover of ice no more than 9,000 years ago.[1] Humans may have been living in Manitoba before that, having migrated into the area principally from the southwest, which was clear of ice and of glacial lakes associated with deglaciation.

Manitoba's natural regions extend beyond its geometric political boundaries. The southern realm of the province forms the eastern part of the Canadian Prairies, the northern extension of the American Great Plains. Southern Manitoba's topography is characterized by the lowlands of former glacial Lake Agassiz,

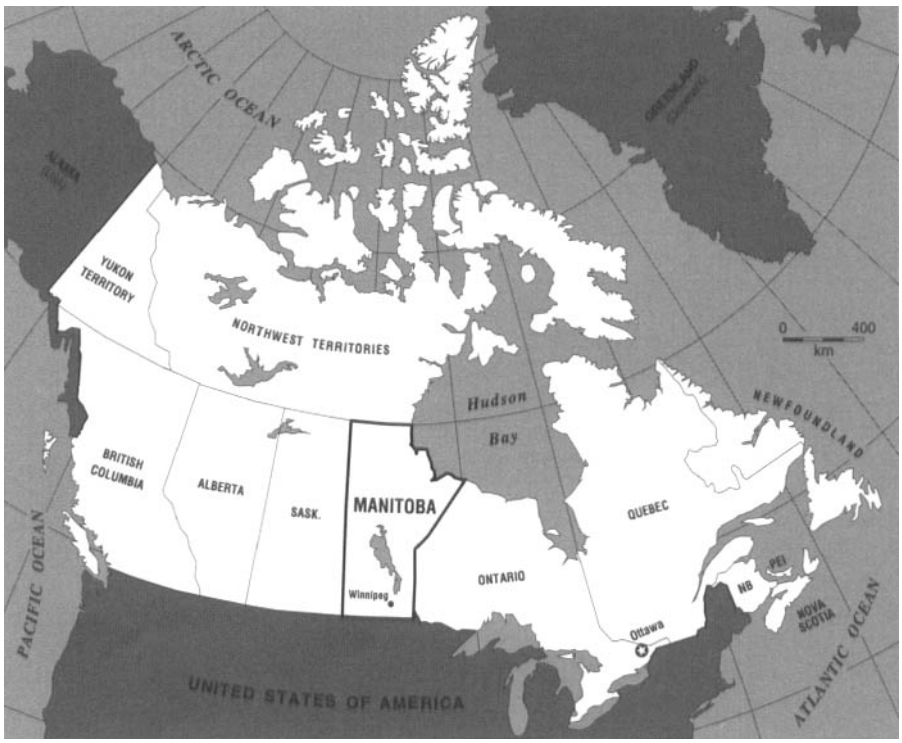

Figure 1.1 The Location of Manitoba

and by the southwestern uplands west of the Manitoba Escarpment with its "mountains." To the north of the dry grasslands of the south extends the "parkland belt," a region with a more humid and cooler climate, which was referred to by Hind as the "fertile belt."[2]

Although Manitoba is generally classified as a "Prairie province," most of its territory is part of the vast Canadian Shield, with its distinctive landscapes of Precambrian rock formations, lakes, and boreal forests. Some of the oldest rocks in the world are found here, and rocks of most geological ages from Precambrian to Tertiary are found somewhere in the province. Along the shores of Hudson Bay, Manitoba extends into the realm of subarctic climate and tundra vegetation.

The southern boundary of the Canadian Shield, as well as its western edge along the eastern shore of Lake Winnipeg, is a sharp dividing line between contrasting natural and cultural landscapes, historical evolution, type of resource utilization, and settlement system. In contrast, the transition from the Shield to the Hudson Bay Lowlands and from boreal forest to tundra is more gradual.

Whereas Manitoba today occupies a central position within Canada, initially, as part of the vast Rupert's Land, it was located outside the 1867 boundaries of the Dominion of Canada. Until the late 19th century, it simply formed part of a territorial bridgehead between Ontario and British Columbia inhabited mostly by Aboriginal groups. In this location, Rupert's Land, and later Manitoba, assumed the functional role of a "gateway" region within the staple economic system of the American continent and Europe, furnishing such key resources as furs, buffalo robes, wheat, and minerals for the expanding markets of the economic core regions.

Throughout the 20th century, Manitoba has continued to be regarded as a "hinterland"[3] within the economic and political framework of Canada. Although at times the demand for resources triggered periods of economic boom and large inflows of migrants in search of land and wealth, these periods of prosperity and optimism were short-lived and were often followed by economic crises, stagnation, and emigration.

Since the beginning of European colonization, with the transformation of grasslands and parkland into productive agricultural regions, and the establishment of a network of railway lines and service centres, the southern part of Manitoba has become the demographic, economic, and political core region of the province. The predominantly agricultural nature of this region has been reinforced and complemented by an industrial base, although this has tended to be mostly urban in location. Compared with the south, the north has lagged behind in economic strength and development, in contrast to the early days of the fur trade, when European incursions originated along the shores of Hudson Bay and the large river and lake system draining into the bay.

With the building of the trans-Canada railway line and the territorial evolution of the Dominion of Canada from "sea to sea," Manitoba assumed a pivotal functional role as transportation link between east and west. This meant a clear reorientation of the transportation and economic linkages of the pre-Confederation and prerailway era, during which the flows of people and goods showed a distinct north-south trend.

As a province of Canada, Manitoba is a young but complex political territory. After being carved out of the Hudson's Bay Company's Rupert's Land in 1870 as the "postage stamp province," it experienced two major stages of territorial growth and achieved its current extent in 1912 (Figure 1.2). The present demographic and economic spatial patterns display a contrast between the contiguously, albeit sparsely, populated and economically dominant south and the economically weaker and more vulnerable north, with its patchy distribution of resources, towns, and reserves.

Many of the settlers some hundred years ago were lured to Manitoba by the prospect of establishing a farm, and the province still carries the image of widely dispersed farmsteads, small villages, and few towns. But the physiognomy of Manitoba today is also characterized by the vertical growth of apartments and office buildings; by the sprawl of residential suburbs; by trailer courts, exurban estates, and

cottages; and by industrial parks and large shopping complexes. Indeed, Manitoba today is a highly urbanized province (in 1991, 72.1 percent of the population was urban),[4] and agriculture accounts for only a small proportion of the provincial employment (about 9.5 percent in 1990)[5] and gross domestic product (5.3 percent in 1986).[6]

Whereas the other Prairie provinces (Saskatchewan and Alberta) are characterized by two metropolitan centres, Manitoba is dominated by and, in the perception of many people living outside the city, overshadowed by a single metropolis — Winnipeg. Although the city has largely lost its major function as a "gateway to western Canada," and its recent growth has lagged behind that of most other western Canadian metropolitan centres, no other Prairie city exhibits the same level of urban primacy.

The trend towards population concentration in and around large cities during the 20th century is the result of a number of economic, social, and political adjustments and changes. Since the 1930s, the trend towards larger farms, periodically occurring agricultural crises, and the lure of nonfarm jobs have significantly reduced the number of farms. The attractiveness of rural living and the vitality of villages and small towns have also been eroded by the reduction of rural infrastructure and services that was justified by an economic rationale that encouraged consolidation and concentration. The decline of the economic and social viability of small settlements was also spurred by the increased mobility of rural residents, by a dramatic expansion of private automobile ownership, by an improved road and highway network, and by the enhanced attractiveness of employment opportunities, shopping facilities, professional services, and entertainment choices in the larger centres. As these factors undermined the traditional service function of villages and small towns, they precipitated the exodus of people from these places. Low rural population densities continue to result in challenges for Manitoba, such as difficulties in retaining professional sports teams.

Besides intraprovincial mobility and migration, Manitoba has witnessed periods of major immigration and emigration. Major phases of immigration occurred during periods of favourable economic conditions in the Prairies: in the 1870s and 1880s, as a result of the Dominion Lands Survey and farmstead programs and the building of the railway system; between the turn of the century and World War I; and during the 1950s and 1960s. These boom periods alternated with periods of economic crisis that resulted in significant outflows of people.

The immigration of people from very different source regions to the Prairies has created a cultural mosaic that finds its spatial expression in distinct rural and urban landscapes and in material cultural expressions. While immigration has continued to the present, albeit at a reduced pace, the occupation, origin, and destination of the migrants have all changed. Immigration from Europe to Manitoba still occurs, but following World War II, immigration from Asian countries and from Latin America has continually increased in importance. In 1990, 26.2 percent of the immigrants still came from Europe, but 53.6 percent were from Asia and 9.6 percent from Central America and the Caribbean countries.[7] Also, the destination of immigrants today is, by and large, the cities, with their concentration of secondary and tertiary employment opportunities.

As most immigrants no longer arrive as large, coherent cultural groups and do not seek to establish "reserves" or other forms of group settlement, they integrate more easily into the social fabric of Canadian society. Nevertheless, there are in Winnipeg a number of ethnic neighbourhoods of recent Latin American and Asian immigrants. With the "drying up" of inflows of some cultural groups that were significant in the past — such as Ukrainians, Mennonites, Icelanders, and Scandinavians — the trend towards cultural assimilation and integration, with a resulting loss of cultural identity, has become more pronounced for these groups. This has led to the regrettable loss of a number of features of the material

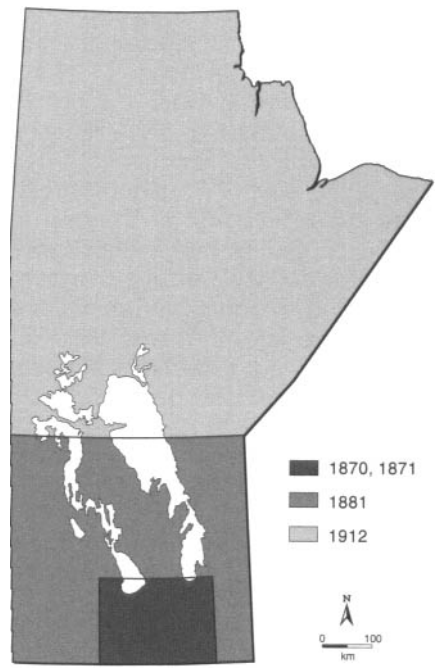

Figure 1.2 The Territorial Growth of Manitoba. The map shows the evolution from the "postage stamp" province of 1870 to the "keystone province" of 1912.

culture and to the disappearance of landscapes that had a distinct ethnic identity.

The 20th century also marked the opening up of northern Manitoba, spurred by the discovery and large-scale exploitation of the key resources — timber, minerals, and water power. Camps for workers and a number of resource towns were quickly built, in planned or unplanned fashion. Some of these "boom/bust towns" soon declined or were even abandoned after the resources were exhausted, when the major construction work was completed, or when the market price of minerals dropped drastically. The nickel-mining city of Thompson quickly expanded after the 1960s to become the major urban centre of northern Manitoba and the third-largest city in the province (after Winnipeg and Brandon). Also, railway lines, highways, and air connections were established to provide transportation links between the southern ecumene and the resource frontier. One of the remarkable pioneer stories in the development of transportation in the north was the building of the railway line to Hudson Bay (completed in 1929) and the founding of the port of Churchill.

In spite of harsh environmental conditions and considerable constraints on the development of its resources, Manitoba has a remarkable history of human achievement. As the province celebrates its 125th birthday as part of Canada, its residents can take pride in living in a land of considerable natural and cultural diversity and in a territory that has offered to its inhabitants a wide range of opportunities. Yet Manitobans have become increasingly aware of the environmental problems and limitations and of the constraints and costs associated with the unrestrained exploitation of its resources.

On the human scene, many Manitobans have been able to achieve a high standard of living and quality of life, but certain segments of the population — such as Aboriginal people and other socially disadvantaged groups — have not benefited fully from growth and development. For some, the trend towards assimilation and integration has threatened or destroyed their cultural identity, value system, and independence. For the Aboriginal population, the price of adopting the "white man's" standards of culture and development has been the loss of or a deterioration in the quality of their land and erosion of their cultural pride and self-reliance.

As Manitoba heads into the 21st century, it faces a number of environmental, social, economic, and political challenges, many of which will be addressed in this book. In the past, Canadian and foreign perceptions of and attitudes towards the Prairies have been ambivalent and changeable. Some people perceived Manitoba and the Prairies as a land of beauty, diversity, and opportunity, where recreation and tourism can be increasingly promoted. Others have rejected this land, especially in times of economic hardship, because of its remoteness, isolation, and backwardness. But as Richards points out, the Prairie region "as always in frontierism, rejects eastern opinions in favour of its own interpretation of Canada."[8]

NOTES

1. A.S. Dyke and V.K. Prest, *Wisconsinan and Holocene Retreat of the Laurentide Ice Sheet* (Ottawa: Geological Survey of Canada, Map 1702A, 1986).
2. H.Y. Hind, *Narrative of the Red River Exploring Expedition of 1857 and of the Assiniboine and Saskatchewan Exploring Expedition of 1858*, 2 vols. (London: Longman, Green, Longman and Roberts, 1860).
3. L.D. McCann, ed., *Heartland and Hinterland: A Geography of Canada* (Scarborough, ON: Prentice Hall Canada, 1982).
4. Statistics Canada, *91 Census* (Ottawa: Statistics Canada, 1992).
5. Canada West Foundation, *Canada West Fact Finder 1992* (Calgary: Canada West Foundation, 1991), 16.
6. Ibid., 25.
7. Ibid., 10.
8. J.H. Richards, "Retrospect and Prospect," in *The Prairie Provinces*, ed. P.J. Smith (Toronto: University of Toronto Press, 1972), 135.

Case Study 1.1
The Manitoba Great Lakes
R.A. McGinn

The Manitoba Great Lakes lie in a lowland basin that was scoured out of the limestone and shale bedrock by continental glaciers during the Pleistocene. When the glaciers melted, about 12,000 years ago, a large lake filled the entire basin. This lake, glacial Lake Agassiz, gradually drained and exposed a flat plain that extends from the Manitoba Escarpment in the west to the rocky edge of the Precambrian Shield in the east. Today the glacial-lake bottom is occupied by Lakes Winnipeg, Winnipegosis, and Manitoba, and the Cedar Lake reservoir – the Manitoba Great Lakes (Figure 1.1.1).

The English explorer Henry Kelsey (1690) may have been the first European to see the "murky waters" (*win-nipi*) of the Manitoba Great Lakes, and adopted the Cree Indian name for the largest of them. Lake Winnipeg is the sixth-largest lake in Canada, occupying an area of 24,390 km².[1] It is estimated to have a maximum depth of 18 m and maintains an average lake level of 217.3 m above sea level (Table 1.1.1). Lake Winnipeg extends 416 km north to south, and drains approximately 984,200 km² of land by way of the Saskatchewan, the Red-Assiniboine, and the Winnipeg river systems. This drainage basin extends from the Front Range of the Rocky Mountains across Alberta, Saskatchewan, and Manitoba to the metamorphic uplands of the Precambrian Shield in Ontario (Figure 18.1 on page 267). It extends southward along the Red River Valley to a point close to the headwaters of the Mississippi River, including large parts of the states of Minnesota and North Dakota.

Lake Winnipeg discharges its waters into the Nelson River, which flows north to Hudson Bay at an average annual rate of approximately 2,170 m³ per second, measured at the Kelsey Generating Station. Since the construction of a lake-outlet control

Figure 1.1.1 The Manitoba Great Lakes

Table 1.1.1 The Manitoba Great Lakes

Name	Elevation (m)	Area (km^2)	Length (km)	Maximum Depth (m)	Drainage Basin Area (km^2)	Outlet Discharge (m^3/sec)	Canadian Ranking
Cedar Lake Reservoir	255.3	1,352	62.5	38.3	364,000	688.0	34
Lake Manitoba	247.5	4,659	208.0	6.3	54,200	73.7	13
Lake Winnipeg	217.3	24,390	416.0	18.0	984,200	2,170.0	6
Lake Winnipegosis	253.1	5,374	195.0	12.0	49,823	77.1	11

structure at Jenpeg, Manitoba, the mean monthly discharge has been regulated, ranging from a monthly low of 469 m^3 per second in July 1988 to a maximum of 3,360 m^3 per second in May 1986. The control structure maintains lake levels at approximately 217 m above sea level and assures an adequate supply of water for the four hydro-electric generating stations on the Nelson River.[2]

Lake Winnipegosis is Canada's 11th-largest lake (5,374 km^2).[3] The 195 km–long lake has an estimated maximum depth of 12 m and an average lake level elevation of 253.1 m above sea level. Lake Winnipegosis drains 49,823 km^2 of western Manitoba and eastern Saskatchewan, drawing most of its waters from the Manitoba Escarpment — Riding Mountain, Duck Mountain, the Porcupine Hills, and the Pasquia Hills — and discharging them through the Waterhen River at an average annual rate of 77.1 m^3 per second into Lake Manitoba. Its interesting name is derived from two sources: *win-nipi*, Cree for "murky waters," and the suffix *osis*, meaning "little."

Originally named Lac des Prairies by La Vérendrye around 1737, and covering an area of 4,659 km^2, Lake Manitoba is the 13th-largest lake in Canada.[4] It drains approximately 54,200 km^2 of western Manitoba and eastern Saskatchewan, including the discharge from Lake Winnipegosis. The lake maintains an average elevation of 247.5 m above sea level and a maximum depth of 6.3 m. Lake Manitoba discharges through the Fairford River into Lake St. Martin, and thence into Lake Winnipeg by way of the Dauphin River. The mean annual discharge measured at Fairford is 73.7 m^3 per second. This 208 km–long, northwest-to-southeast-trending lake is naturally divided at The Narrows into a northern and southern basin. One native legend states that the drumming of a "manitou" or spirit can be heard from the shore of The Narrows, and the Cree name for this "Strait of the Spirit," *manitobau*, has been adopted as the name of the province's 3rd-largest lake.

Construction of an earthfill dam and 25.6 km of dikes in 1961–64 at Grand Rapids, Manitoba, raised water levels on Cedar Lake 3.65 m, creating the 1,352 km^2, 62.5 km–long Cedar Lake reservoir in west-central Manitoba, north of Lake Winnipegosis.[5] At an elevation of 255.3 m above sea level, Cedar Lake reservoir draws most of its waters from the 364,000 km^2 Saskatchewan River drainage basin. The dam and the reservoir assure a mean annual flow of 688 m^3 per second at the associated Grand Rapids hydro-electric generating station.

On long and relatively narrow lakes such as Lake Winnipeg, Lake Winnipegosis, and Lake Manitoba, interesting wind and wave effects occasionally take place.[6] When the prevailing northerly winds blow along the length of these lakes, they exert a horizontal stress on the surface. Surface waters move in the direction of the wind and pile up along the windward south shores — a phenomenon known as a set-up or wind tide. Set-ups greater than 1.00 m above normal lake levels have been recorded along many of southern Lake Winnipeg's recreational beaches, and the associated high waves with their uprush effects have caused considerable storm damage, backshore flooding, and shoreline erosion. The highest set-ups generally occur in the fall, when the northerly winds are strongest. If the winds die down suddenly, the waters rush northward, then slosh back and forth in a process called "seiching."

In a land of a hundred thousand lakes, four lakes — Cedar Lake, Lake Manitoba, Lake Winnipegosis, and Lake Winnipeg — collectively contain over 35 percent of the province's fresh water. They cover an area of 35,775 km^2 and collect runoff from over 1 million km^2 (50 percent of the area of the Prairie provinces). These four lakes are indeed the Great Lakes of Manitoba.

NOTES

1. Canada, Department of the Environment, *Inventory of Canadian Freshwater Lakes* (Ottawa: Department of the Environment, Inland Waters Directorate, 1973); R.K. Lane, "Plate 18: Large Lakes," in *Hydrological Atlas of Canada* (Ottawa: Minister of Supply and Services, Canadian National Committee for the Hydrological Decade, 1978); R.A. McGinn, "Lake Winnipeg," in *The Canadian Encyclopedia*, ed. J.H. Marsh (Edmonton: Hurtig Publishing, 1988), 1953.
2. Manitoba, *Lake Winnipeg, Churchill and Nelson Rivers Study Board Report* (Winnipeg: Province of Manitoba, 1975).
3. Lane, "Large Lakes," 1978; R.A. McGinn, "Lake Winnipegosis," in *The Canadian Encyclopedia*, ed. J.H. Marsh (Edmonton: Hurtig Publishing, 1988), 1954.
4. J. Crowe, *Lake Manitoba — The Third Great Lake* (Winnipeg: Manitoba Department of Mines, Resources and Environmental Management, Information Series No. 5, 1977); D. Francis, "Lake Manitoba," in *The Canadian Encyclopedia*, ed. J.H. Marsh (Edmonton: Hurtig Publishing, 1988), 1,083–4.
5. R.A. McGinn, "Cedar Lake Reservoir," in *The Canadian Encyclopedia*, ed. J.H. Marsh (Edmonton: Hurtig Publishing, 1988), 306.
6. J.P. Bruce and R.H. Clark, *Introduction to Hydrometeorology* (Toronto: Pergamon Press, 1966).

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PART 1

THE PHYSICAL BACKGROUND

The area that is now Manitoba encompasses a remarkable variety of geology, landforms, climate, soils, vegetation, and wildlife. Some of the oldest rocks on the earth's surface are located here. Much of the north and east is located on the Canadian Shield, where Precambrian rocks have been worn down to a vast low-lying plain on which details have been etched by glacial and postglacial events (M.T. Corkery, Chapter 2). South and west of the Shield, the surface bedrock is newer (Paleozoic and younger), with the Manitoba Escarpment, a ridge of Cretaceous shales, being the major landform. Over this region the influence of the Pleistocene glaciations was profound. Although the landforms of Manitoba are not spectacular compared with those of Alberta and British Columbia, the province has more to offer than just the flat, unending plains often associated with the word "prairie."

Between the Shield and the Manitoba Escarpment, a belt of limestone and dolostone extends across the province from south of Winnipeg to near Flin Flon. These rocks are susceptible to solution, which results in karst scenery, including caves and other related solution features (G. Sweet, Case Study 2.1 on page 23). Although the caves are small by world standards, they represent a distinctive aspect of the scenery of Manitoba.

The main impact of glaciation in southern Manitoba was in the form of deposition. Most of the landforms associated with deposition by a major ice sheet are present, including end moraines that represent ice marginal positions as the ice retreated. One of the best and most easily accessible examples is the Brandon Hills in the southwest of the province (J. Welsted and H. Young, Case Study 2.2 on page 25). Following deglaciation, the drainage, which had been blocked by the ice to form glacial lakes, evolved to its present situation. Glacial Lake Agassiz emptied to leave the present Manitoba Great Lakes (R.A. McGinn, Case Study 1.1 on page 6). In addition rivers changed their position in the landscape. For example, the Assiniboine, which now joins the Red, at one time flowed into Lake Manitoba, and over the past 7,000 years it has changed position many times (W. Rannie, Case Study 2.3 on page 28).

Although its geomorphology is fascinating, Manitoba is perhaps best known for its extreme climate, explainable in large measure by its position on the North American continent (D. Blair, Chapter 3). Not only is the climate extreme, it is also variable, as evidenced by the winter of 1991–92, which was extremely warm, and the summer of 1992, which was extremely cold (A. Catchpole, Case Study 3.1 on page 40). Precipitation is also variable, with drought being a recurring theme in the history of the province. Although droughts are often perceived as unpredictable, there may be a drought cycle that would make them easier to forecast in the future (T. Ball, Case Study 3.2 on page 41).

With its large latitudinal extent, Manitoba exhibits a range of ecoclimatic provinces, from the Transitional Grassland in the

south to the Low Arctic in the north (G. Scott, Chapter 4). The original vegetation in these provinces included grasslands, parklands, broadleaf woodlands, coniferous forests, and shrub tundra, as well as extensive areas of marshlands and swamps. The associated soils include all nine orders of the Canadian Soil Classification System. Three of the major North American vegetational formations — the Grassland (or "Prairie"), the Boreal (Northern Coniferous) Forest, and the Temperate (Eastern Deciduous) Forest — overlap at the Spruce Woods Sandhills, a set of landforms developed on the sands of a delta deposited into the western margin of glacial Lake Agassiz (A. Rogosin, Case Study 4.1 on page 56).

GEOLOGY AND LANDFORMS OF MANITOBA

2

M. Timothy Corkery

The geological history of Manitoba spans more than 3.5 billion years. By studying the rocks of the province, geologists can deduce what the landscape of Manitoba was like millions, or hundreds of millions, of years ago. At times seas covered the whole province; at other times the province was covered by up to 1.5 km of ice. There were volcanic islands in the area that is now Flin Flon, and two continents collided in the Thompson area. Rocks can reveal whether it was warm or cold and indicate when our province was close to the equator. Also, by studying fossils we can even deduce something about the animals that lived here long before there were people.

Geologists partition the history of the earth in the same way that historians subdivide and name different periods of human history, such as the Bronze Age and the Renaissance. In the earth's history, the two major time divisions, termed *eons,* are the Precambrian (the time when there was little living) and the Phanerozoic (the time when evidence suggests life was abundant). Each of these eons was hundreds of millions of years long, so they are further divided into *eras:* the Precambrian is divided into the Archean and Proterozoic, and the Phanerozoic is divided into the Paleozoic (the time when early forms of life existed in the seas and then spread onto the land); the Mesozoic (often called "the age of reptiles"); and the Cenozoic (the time when warm-blooded animals — mammals — became dominant) (Table 2.1). The Phanerozoic eras are further subdivided into *periods.* Manitoba's geological history is so rich that much of the geological time scale is represented in our rocks.

The rocks and minerals that formed at different times in the past occur in different places throughout the province (Figure 2.1). The oldest rocks in Manitoba were formed during the Precambrian eon, and are exposed in the Precambrian Shield that stretches from southeastern Manitoba northwestward to Saskatchewan and the Northwest Territories. Younger sedimentary rocks of the Phanerozoic eon are found in the southwest of the province and in the Hudson Bay Lowlands, in the northeast.

In south-central Manitoba, rocks deposited in shallow seas during several periods of the Paleozoic are found; these periods are, from oldest to youngest, the Ordovician, Silurian, Devonian, and Mississippian. For the Mesozoic era, we have rocks deposited during the Jurassic and Cretaceous periods, and in some locations these are overlain by Cenozoic rocks from the Tertiary period. Of most recent origin are glacial sediments from the Quaternary period that cover much of the province.

HISTORY IN THE ROCK RECORD

Precambrian

Rocks in the Precambrian Shield are predominantly igneous in origin but include areas of metamorphosed volcanic and sedimentary rocks called *greenstone belts.* Broad areas of igneous rocks were formed by the cooling and crystallization of extremely hot melted rock material

called *magma*. After the old rocks of the Precambrian Shield were formed, they were buried deeply in the earth and changed by heat and pressure to metamorphic rocks. However, this explanation is oversimplified; the rocks are able to tell us more about the distant past. They tell of continents colliding, volcanoes erupting, and great wandering rivers in mountains that may have been as majestic as the Rockies today. At times the area that is now Manitoba was even in a different global position from that which it occupies today.

Archean

The rock record of Manitoba starts in the Precambrian eon about 3.5 billion years ago. In the eastern part of the Precambrian Shield, in the area known as the Superior Geologic Province, rocks were formed during the Archean era and are more than 2.5 billion years old. Early in the Archean, from about 2.7 to 3 billion years ago, there was no large continent as there is today. At that time ocean basins existed with black pillowed basalts[1] being formed along ocean ridges, much like mid-ocean spreading ridges found in the Atlantic and Pacific today. Also, chains of volcanic islands known as island arcs were being formed. Remnants of rocks formed during these times are preserved in the greenstone belts. Very old areas of continental granites are preserved, indicating that some continental land masses must also have existed in the early Archean era. Very slowly, the forces that move continents today were at work moving the various segments of the crust together to form the Superior Craton (Continent) by about 2.7 billion years ago.

Geological forces are imperceptibly slow but never idle, and 2.7 billion years ago a major geological event called an *orogeny* began. During the next 60 million years high mountains were thrust up and great rivers ran through deep valleys. Gravel and sand deposited by these rivers are preserved in some of the greenstone belts. Also during this period of mountain building, called the Kenoran Orogeny, many of the granitic rocks of the Superior Geologic Province were formed, and tremendous heat and pressure metamorphosed the rocks beneath the high mountains.

Thus, by the end of the Archean, 2.5 billion years ago, the Superior Province of Manitoba had changed from oceanic basin and islands in some unnamed sea — similar to the East Indies of today — into a continent with mountains along the western edge, near where Thompson is now located.

Table 2.1 Geological Formations of Manitoba

AGE*	ERA	PERIOD	EPOCH	FORMATION	MEMBER	MAX THICK (m)	BASIC LITHOLOGY
	CENOZOIC	QUATERNARY	RECENT				Top soil, dune sands
			PLEISTOCENE	GLACIAL DRIFT		140	Clay, sand, gravel, boulders, peat
		TERTIARY	PLIOCENE MIOCENE OLIGOCENE EOCENE				
50			PALEOCENE	TURTLE MTN.		120	Shale, clay and sand. Lignite beds — located only in Turtle Mountain
65	MESOZOIC	CRETACEOUS	UPPER CRETACEOUS	BOISSEVAIN		30	Sand and sandstone, greenish grey — located only in Turtle Mountain
				RIDING MTN.	COULTER ODANAH MILLWOOD	310	Grey shale — non-calcareous, local ironstone, bentonite near base, gas found
				VERMILION RIVER	PEMBINA	155	Shale, dark grey carbonaceous non-calcareous; bentonite bands
					BOYNE		Shale, grey speckled calcareous, bentonitic; slightly petroliferous
					MORDEN		Shale, dark grey non-calcareous, concretions, local sand and silt
				FAVEL		40	Grey shale with heavy calcereous specks, bands of limestone and bentonite
100			LOWER CRETACEOUS	ASHVILLE ASHVILLE SAND		115	Shale, dark grey non-calcareous, silty quartz sand or sandstone
				SWAN RIVER		75	Sandstone and quartz sand, pyritic shale — grey non-calcareous
		JURASSIC	UPPER JURASSIC	WASKADA		200	Banded green shale and calcareous sandstone
150				MELITA			Bands of limestone, vari-coloured shale
			MIDDLE JURASSIC	RESTON		45	Limestone, buff, and shales, grey
				AMARANTH	UPPER: EVAPORITE	45	White anhydrite and/or gypsum and banded dolomite and shale
200					LOWER: RED BEDS	40	Red shale to siltstone, dolomitic, oil producing
250		TRIASSIC PERMIAN PENNSYLVANIAN		ST. MARTIN COMPLEX		300	Carbonate breccia, trachyandesite (crypto-explosion structure) Permian-Triassic (?)
300		MISSISSIPPIAN		MADISON GROUP: CHARLES		20	Massive anhydrite and dolomite
				MADISON GROUP: MISSION CANYON		120	Limestone, light buff, oolitic, fossiliferous fragmental, cherty, bands of shale and anhydrite, oil producing
				MADISON GROUP: LODGEPOLE		185	Limestone and argilaceous limestone, light brown and redish mottled. Zones of shaly, oolitic, crinoidal and cherty limestone Oil producing
				BAKKEN		20	Two black shale zones separated by siltstone. Oil show
350	PALEOZOIC	DEVONIAN		QU'APPELLE GROUP: LYLETON		35	Red siltstone and shale, dolomitic
				SASK. GROUP: NISKU		40	Limestone & dolomite, yellow-grey fossiliferous, porous, some anhydrite
				DUPEROW		170	Limestone and dolomite, argilaceous and anhydritic in places
				MAN. GROUP: SOURIS RIVER (1st RED)		120	Cyclical shale, limestone and dolomite, anhydrite
				DAWSON BAY (2nd RED)		65	Limestone and dolomite, porous, anhydrite — local shale red & green
				ELK POINT GROUP: PRAIRIE EVAP.		120	Salt, potash and anhydrite, dolomite interbedded
				WINNIPEGOSIS		75	Dolomite, light yellowish brown, reefy
				ELM POINT			Limestone, fossiliferous high-calcium
400				ASHERN		12	Dolomite and shale, brick red
		SILURIAN		INTERLAKE GROUP		135	Dolomite, yellowish-orange to greyish-yellow, fossiliferous silty zones
		ORDOVICIAN		STONEWALL		15	Dolomite, greyish-yellow, bedded
				STONY MOUNTAIN	WILLIAMS GUNTON	30	Dolomite, yellowish-grey, shaly
					PENITENTIARY		Dolomite, dusky yellow, fossiliferous
					GUNN	20	Shale, red-green, fossiliferous, limestone bands
450				RED RIVER	FORT GARRY SELKIRK CAT HEAD DOG HEAD	170	Dolomitic limestone, mottled, and dolomite
				WINNIPEG		60	Shale, green, waxy; sandstone interbedded
500							Sand and sandstone, quartzose
		CAMBRIAN		DEADWOOD		60	Glauconitic sandstone and siltstone, and shale; green-grey to black; very edge of S.W. Manitoba only
550							
	PRECAMBRIAN (EON)						Acid and basic crystalline and metamorphic rocks

*millions of years before present

Source: *Geological Highway Map of Manitoba 1994*, 2nd ed. (Winnipeg: Manitoba Minerals Division, 1994).

Proterozoic

The Proterozoic era started some 2.5 billion years ago. There is evidence that a portion of the western margin of the Superior Geologic Province was rifted away westward about 2.2 billion years ago, creating an oceanic basin in the same fashion that the Atlantic Ocean has opened and spread to separate the Americas from Africa and Europe. Within this new ocean the cycle of ocean floor spreading, island arc de-

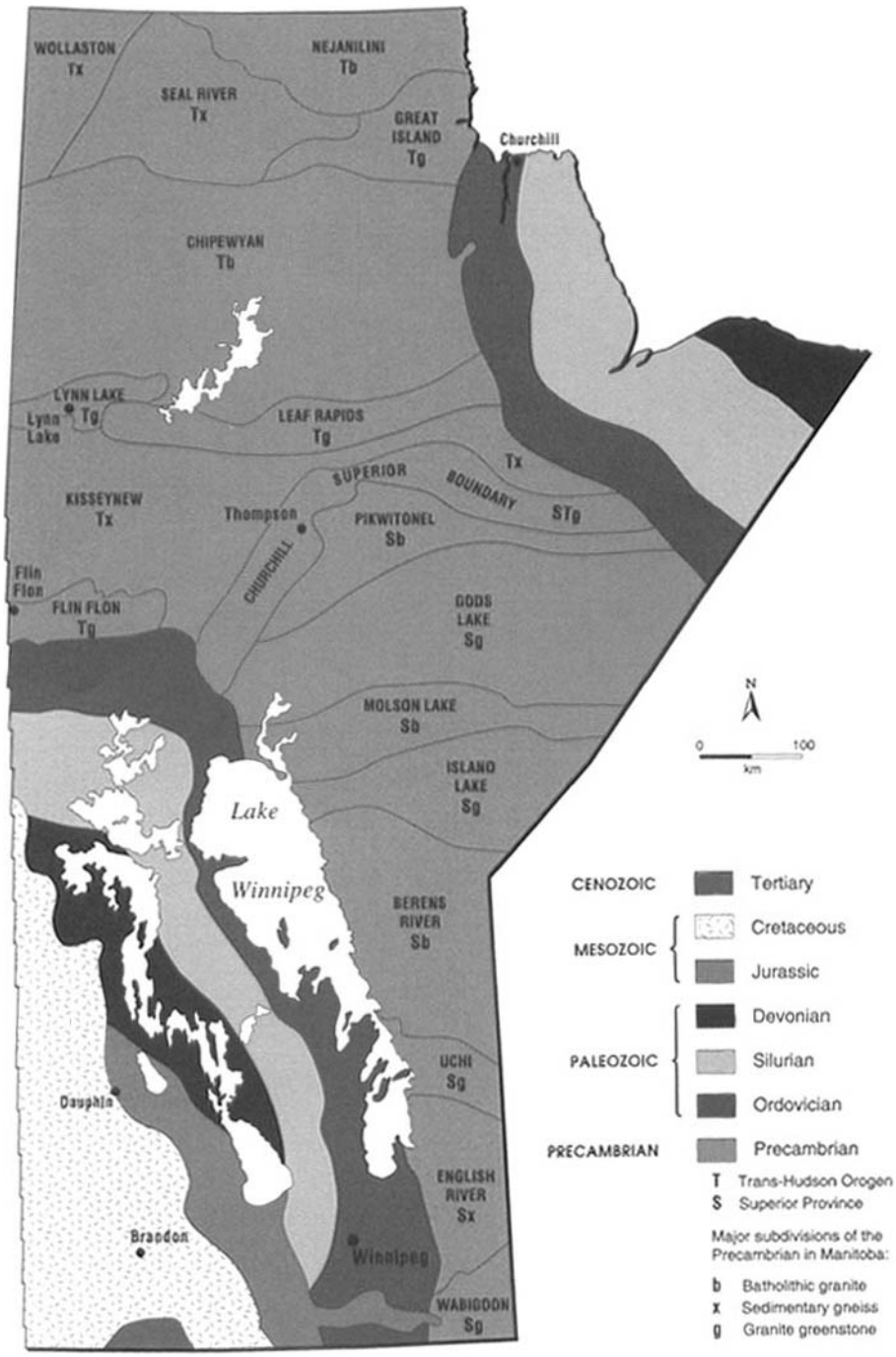

Figure 2.1 Generalized Geology of Manitoba (Source: Modified from Geological Highway Map of Manitoba 1994, *2nd ed. [Winnipeg: Manitoba Minerals Division, 1994])*

velopment, and sedimentation began again.

The famous Thompson Nickel Belt was forming along the west coast of the Superior Continent. The sands of the day were sitting on the granites and gneisses of the worn-down mountains from the Kenoran time about 600 million years before. Out in the seas to the west, deposits of mud and sand were building up on the bottom, and new chains of volcanic islands were being formed in the basin. During this time the Flin Flon, Lynn Lake, and Thompson ore deposits were formed.

As in the Archean, pressures built up and another old Archean continent to the northwest drifted towards the Superior Craton. In the same way that India ran into Asia and pushed up the Himalayas, the Hearne-Rae Craton squeezed the sediments, volcanics, and ore deposits formed during the Proterozoic and created a chain of mountains. Again the rocks were melted and metamorphosed during another mountain-building event, called the Trans-Hudson Orogeny, which closed the Precambrian eon in Manitoba.

The geological cycle of continental rifting and ocean floor spreading, closure of the ocean basin by subduction of the oceanic plate, and continental collision concurrent with a mountain-building event has been repeated many times throughout geological history. It has now come to be known as the Wilson Cycle, after the famous Canadian geologist J. Tuzo Wilson, whose pioneering work led to the theory of plate tectonics.

Phanerozoic

By the beginning of the Phanerozoic eon, the area that is now Manitoba had been eroded down to a relatively flat to undulating peneplain (almost a plain) located in the centre of the continent. Sediments deposited since then have not been disturbed except by periods of erosion when the land was above sea level, because Manitoba, unlike the mountainous areas of Alberta and British Columbia, has not been disturbed by a more recent orogeny. This has resulted in the preservation of abundant fossils and sedimentary features in the rocks of the Paleozoic era.

All the younger (Phanerozoic) rocks in Manitoba are sedimentary. There are two types of sedimentary rocks: clastic rocks and chemical rocks. A clastic rock is formed when an older rock is (1) broken into fragments, (2) transported by water or air, (3) deposited to form a sediment such as a beach sand, and then (4) lithified (made into a solid rock), typically by cementation. Clastic rocks are widespread in southwestern Manitoba.

A chemical rock forms by precipitation of atoms or molecules from a solution within an ocean or lake. This can occur when organisms such as coral or clams make their shells; alternatively, if too much of a certain substance is dissolved in the solution, it precipitates to form a rock. Chemical rocks are abundant in the Manitoba Lowlands of south-central Manitoba and in the

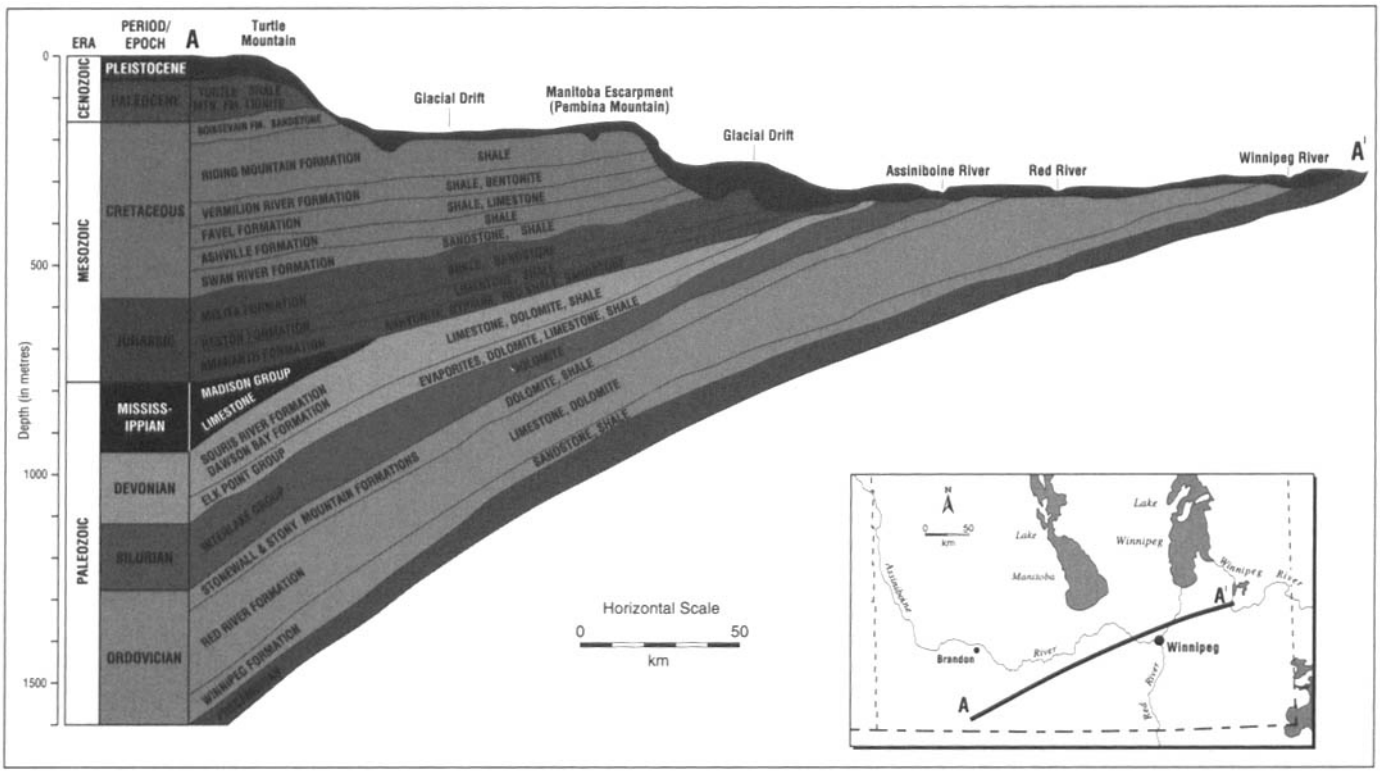

Figure 2.2 Geological Cross-section of Southern Manitoba (Source: Modified from Geological Highway Map of Manitoba 1994, *2nd ed. [Winnipeg: Manitoba Minerals Division, 1994])*

Hudson Bay Lowlands.

Manitoba has rocks from most periods in the Phanerozoic eon (Figure 2.2), but there are some gaps. For instance, there are no rocks from the Pennsylvanian, Permian, or Triassic periods, nor are there any from the Upper Jurassic. During these times all of Manitoba was above sea level as it is today, and as now, the rocks that were deposited during the previous periods were eroded by river and wind activity. Thus during these times, not only were no new sedimentary rocks deposited in our geological record but we were actually losing pieces of the record. When a new shallow cratonic sea again covered the central part of North America during the Jurassic period, the sedimentary record resumed, with the sediments being deposited on the eroded surface of the older Paleozoic strata. This type of contact is called an *unconformity* (Figure 2.2).

Paleozoic

Paleozoic sedimentary rocks cover the Precambrian Shield in the Hudson Bay Lowlands and in southwestern Manitoba. These rocks accumulated in depressed areas in the earth's crust known as sedimentary basins, two of which influenced sedimentation in Manitoba: the Hudson Bay Basin, centred in Hudson Bay, and the Williston Basin, centred in northwestern North Dakota.

The Williston Basin developed from the south as the seas advanced over the slowly subsiding Precambrian Shield. This advance of the sea, termed a *transgression,* left deposits of sandstone (dominated by the quartz-rich sandstone of the Winnipeg Formation) as it flooded northward (Table 2.1). As the Precambrian Shield continued to subside, sediments accumulated on the shallow bottom of the ancient sea at a rate that kept pace with the sinking of the crust below. These sediments formed the dolomites, limestones, and interbedded shales of the Red River Formation. The rocks dip gently towards the centre of the basin in North Dakota, where subsidence was greatest (Figure 2.2). The Paleozoic rocks of the Williston Basin contribute to Manitoba's mineral industry through products such as silica sand, dolomitic limestone for building stone, dolomite, and high-calcium limestone for cement; subsurface deposits of salt and potash are potential products (Chapter 16). In addition, some of the rocks serve as reservoirs for petroleum.

At this time Manitoba was at a tropical latitude, covered by warm, shallow seas that teemed with newly developing life. As a result, numerous fossils such as corals, trilobites, and brachiopods are found in Paleozoic rocks. It was during this era that an explosion of life forms occurred. However, this does not indicate that life began in the early Paleozoic, but rather that a wide array of animals evolved hard parts that could be preserved as fossils. It is an unanswered question why the sudden explosion of these life forms occurred at this time.

Paleozoic rocks in Manitoba contain representatives of all the major phyla of the animal kingdom (Table 2.2). A partial list of fossils from the Stony Mountain Formation (Ordovician) includes several kinds of coral, snails, brachiopods, crinoids, sponges, trilobites, nautiloid cephalopods, and even some of the earliest armoured fishes.

Table 2.2 Major Phyla of the Animal Kingdom

Phylum	Animals Included
Porifera	Sponges
Coelenterata	Corals, sea anemones
Mollusca	Clams, snails, squid
Annelida	Worms of all shapes and sizes
Arthropoda	Trilobites (extinct), crustaceans (crabs, crayfish, shrimp, barnacles), insects, chelicerates (spiders, scorpions, ticks, mites)
Echinodermata	Starfish, sea cucumbers, sand dollars, sea urchins, crinoids
Chordata	Almost all animals with a backbone (fish, amphibians, dinosaurs, reptiles, birds, mammals)

Mesozoic

At the conclusion of the Paleozoic era, the marine sedimentary rocks were raised above sea level and eroded. This erosional surface was characterized by the development of sinkholes and caves in limestone, and by the development of hills and valleys. Later, downward movement of the earth's crust led to a return of shallow seas and to the accumulation of Mesozoic sediments on the erosional surface. The contact between the eroded Paleozoic rocks and the base of the Mesozoic rocks is another example of an unconformity. Mesozoic sediments, which formed red siltstones, sandstones, shales, and gypsum, were deposited in ancient seas that covered Manitoba from about 64 to 225 million years ago. Distant volcanic activity, probably in western North America, spread volcanic ash, which was later altered to beds of bentonite, across Manitoba. Gypsum, bentonite, brick clay, and shale are important mineral products from the rock formations of the Mesozoic era (Chapter 16).

With the return of the shallow seas, most of the species that had previously lived in the region returned, with some noteworthy exceptions; for example, trilobites and graptolites, which would have done well in a similar environment, were extinct by this time. However, fossils of large marine vertebrates, such as mosasaurs and plesiosaurs, are found in Mesozoic strata. This was the age of reptiles, and although fossils of dinosaurs have not been found in the predominantly marine strata in Manitoba, the rocks of equivalent age to the west have abundant dinosaur remains. There is still a possibility of finding fossil dinosaurs in Manitoba, in the eastern margins of the deltaic systems of rivers flowing from the mountains to the west.

Cenozoic

Only a small portion of Manitoba contains rocks of early Cenozoic time, which began about 64 million years ago. Paleocene strata of the Turtle Mountain Formation are limited to a relatively small isolated area capping the topographic high of Turtle Mountain, in southwestern Manitoba. These strata, consisting primarily of fine sandy and silty shales, rest directly on Mesozoic rocks.

The past 55 million years has been a time of relative geological stability in central North America. The region was uplifted from the sea and became a flat plain. There was little sedimentation, and erosional patterns began to develop on the plains. Animal life became diverse and abundant; paleontological digs in 10-million-year-old sediments in the central plains of the United States indicate that dozens of hoofed species, similar to those found in the African plains of today, were present. Grazing animals such as horses, pronghorns, and camels occupied the grasslands, which they shared with varieties of elephant, rhinoceros, and tapir. The presence of fossil tortoises and alligators, which could not survive extended periods of cold weather, indicates a warm climate. Carnivores such as sabre-toothed cats, bears, dogs, and small weasels found no lack of food on these grassy plains. Even an unusual sabre-toothed deer found a niche in the environment.

As the climate changed with approach of the Ice Age, so did the animal life. Woolly mammoth, bison, and other cold-tolerant species took the place of the savanna-dwelling populations. Possibly the latter were finally driven to extinction as colder winters and dry conditions reduced their range.

PREGLACIAL TOPOGRAPHY AND DRAINAGE

The land was uplifted about 50 million years ago, and the Mesozoic seas retreated from Manitoba; even Hudson Bay may have been elevated above sea level. This newly exposed, generally flat former seafloor was subjected to erosion by rivers. Erosional patterns that persist today began to develop on the thick Cretaceous shales that covered most of southern Manitoba 55 million years ago. The land then, as now, sloped away to the east from the Rocky Mountains, and rivers flowed eastward across the Prairies, down this gentle slope towards the Canadian Shield (Figure 2.3). Some were diverted northward into the Mackenzie watershed, others south to the Mississippi watershed, and possibly some flowed across the

Shield to drain to the area where Hudson Bay is today.

It is difficult to locate these ancient river and stream valleys because they have been deeply buried beneath glacial deposits, but they had 50 million years to erode the Mesozoic shales that may have extended as far east as the Ontario border.[2] Before the onset of glaciation, the shales were eroded back to the Manitoba Escarpment, and the eastward-flowing streams carved deep valleys, producing the embayments in the escarpment that are now occupied by the Assiniboine, the Valley River, and the Swan River.

The Manitoba Escarpment is, then, a preglacial feature. It was not significantly eroded by glaciation because of the erosion-resistant nature of the overlying hard gray Odanah shale. This shale, with its high silica content derived from volcanic ash and the remains of siliceous microorganisms, formed a resistant caprock to the Manitoba Escarpment and prevented it from being reduced to the level of central and eastern Manitoba. The escarpment generally forms the easternmost edge of Cretaceous rocks in the province.

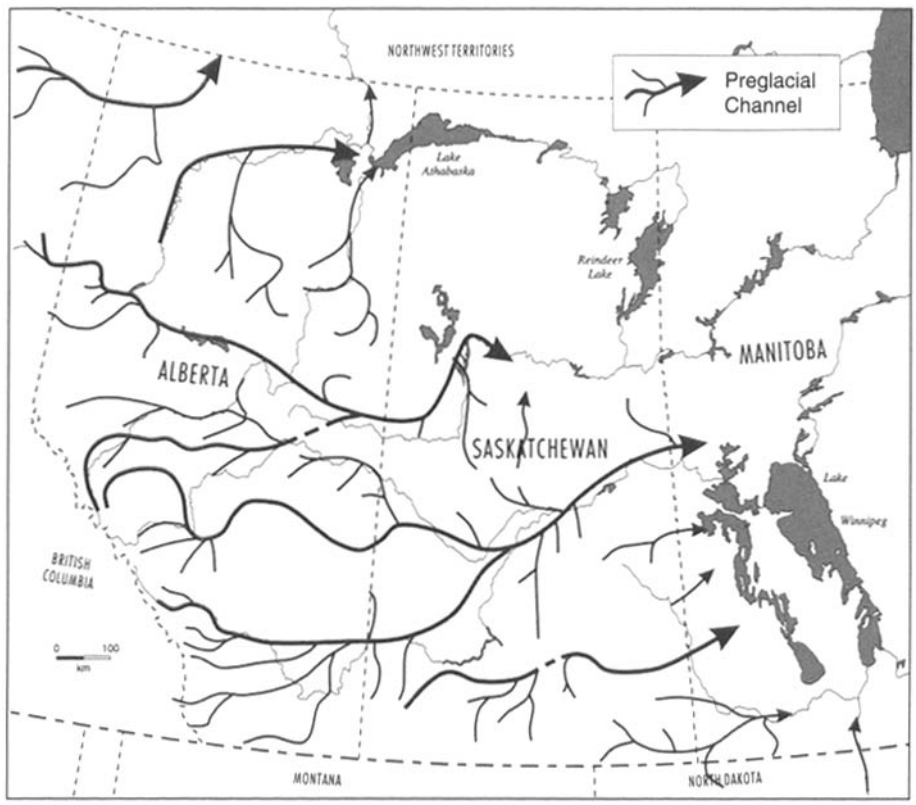

Figure 2.3 Preglacial Drainage of the Prairies (Source: Modified from J.B. Bird, The Natural Landscapes of Canada *[Toronto: Wiley Publishers of Canada, 1972], 117)*

GLACIATION

Glacial Periods

Periods of glaciation are not restricted to the time we call the Ice Age. During the 4.5-billion-year history of the earth, global climatic conditions have changed many times; indeed, major fluctuations are the norm rather than the exception. While Manitoba was basking in the sunny conditions and warm seas of the Paleozoic era, other continents, such as Africa and South America, experienced repeated glacial periods. This reflects the global position of the continents as they were moved by plate tectonics during these times. However, proximity to the earth's polar regions did not always mean ice and cold; there is evidence of great forests similar to those on the west coast of Canada near the North Pole during Mesozoic times, indicating a global warm spell.

During a glaciation, climatic conditions are so cold that continental glaciers expand thousands of kilometres from high latitudes, and alpine glaciers build up and flow down from the mountains. This happens when the annual addition of winter snow is greater than the melting or sublimation in the summer. Even small amounts of annual addition of snow, which turns to ice, will build up over thousands of years. The resulting ice, which in our area is estimated to have been as much as 3 km thick over Hudson Bay and possibly 2 km thick over Winnipeg, will try to form a level surface just as water seeks the lowest point as gravity pulls it downward. Thus, as the ice thickens by annual addition of snow, the margins are pushed from behind and the ice advances as the glacier flows to reach an equilibrium.

As well as spreading out over the land surface, the immense weight of ice depresses the earth's crust; as the density of ice is about one-third that of the rocks, it is estimated that 3 m of ice will depress the earth about 1 m. So in the region of Hudson Bay, the earth's crust may have been depressed by as much as 1,000 m. When the climate changes again and warms enough so that the winter addition of ice is less than the summer reduction, the glacier slowly stops advancing and the edges melt away faster than the ice can flow.

At this point the glacier is said to be receding; as the weight of the glacier is removed, the lands rise back to their equilibrium position by a process called *isostatic rebound*. This rebound is fast at first and then slows. It is not complete even today, and in the area of Churchill the rate of rise is still about 70 cm per century.

As the ice advances over the ground, it picks up loose gravel and soil, which are then frozen into its base, producing an effective abrasive as the moving ice erodes and reshapes the land below. Glacially polished outcrops with straight grooves called striations or crescent-shaped fractures called chatter marks are one result of the movement of the debris-laden ice over the rocks.

Eroded material that is picked up by the glacier is transported and later deposited as *till,* an unsorted,

unlayered mass of debris. Water from the melting glacier also deposits sediments known as outwash deposits, and still other materials are deposited along the shores and on the floors of glacially dammed lakes.

During the last several million years of the Pleistocene epoch, Europe, Asia, North America, and Antarctica have been in a relatively cold period — often so cold that vast areas were covered by repeated advances of the continental ice sheets. Studies indicate that there have been numerous periods of glaciation, each lasting thousands of years, the most recent of which, termed the Wisconsinan, began about 75,000 years ago and ended about 8,000 years ago.

Ice sheets did not continuously cover all of Canada during this time but fluctuated north to the Arctic and south into the United States as the climate varied. Ice from the last glaciation receded about 7,000–8,000 years ago, after a 15,000-year period of continually moving glacial ice. The erosion and deposition from these episodes of glaciation and the significant sedimentary deposits formed by meltwater as the glaciers continued their slow 3,500-year process of melting and retreat are responsible for most of Manitoba's present-day landscape.

Results of Glaciation

The effects of the glaciation of Manitoba can be grouped under four headings: glacial erosion, glacial deposition, creation of glacial lakes and the alteration of the drainage system, and the results of isostatic depression and rebound.

Glacial Erosion

The preglacial topography of Manitoba was devoid of high mountains and deep valleys; consequently, the potential for alpine glaciation producing spectacular landforms such as in the mountains of Alberta and British Columbia did not exist. Nevertheless, glacial erosion played a role in the evolution of the landscape of Manitoba, particularly of the north. Here the ice scraped off the surface materials, leaving behind extensive exposures of bedrock once the ice melted. Glacial scouring and etching took the form of striations and gouges on a small scale, and the larger north-south and northwest-southeast flutings in the Westlake and Interlake regions. Over the rest of southern Manitoba, evidence of glacial erosion is largely absent, or at least hidden by glacial deposition. However, at one stage ice flowing from the Hudson Bay region may have been blocked by the Manitoba Escarpment.[3] As this ice was channelled to the southeast, it may have scoured the edge of the escarpment.

Glacial Deposition

Much of Manitoba is covered by glacial, glaciofluvial, and glaciolacustrine deposits, although especially in the southeast, east, and parts of the north, bedrock is exposed at the surface. Till and glaciofluvial deposits are widespread, as are many of the landforms commonly associated with deposition by a major ice sheet. Hummocky stagnation moraine[4] (ground moraine) covers large parts of Turtle Mountain, Riding Mountain, Duck Mountain, and the Porcupine Hills. In the area between Deloraine and Waskada in the southwest, this ground moraine has a distinctive circular ridge pattern, whereas further east, particulary northwest of Killarney, low till ridges 1.5–6 m high trend northeast to southwest.

Classic "inverted-spoon-shaped" drumlins are not common in southern Manitoba, but rock-cored streamline hills have been mapped in the Holland/Treherne/Notre Dame de Lourdes area,[5] and drumlins and drumlinlike ridges have been mapped in the area between Binscarth and Russell.[6] Similar features are widespread throughout northern Manitoba.

Eskers and kame complexes are also abundant in both the north and the south. Numerous small eskers were mapped by Elson[7] in the area south and west of Baldur and in the area between Cartwright and Crystal City, and by Klassen[8] east of the Assiniboine River southwest of Birtle. The Arrow Hills, a prominent landform rising 50 m above the surrounding landscape northwest of Oak Lake, are probably an esker. A prominent esker also marks the eastern end of the Brandon Hills.[9] But perhaps the best known esker is that at Birds Hill, 16 km northeast of Winnipeg. Here a high, narrow ridge of sand and gravel extends 6.5 km east from Birds Hill and then merges into a delta-shaped plateau that extends over a broad area underlying Birds Hill Park. The esker is the main source of aggregate material for the city of Winnipeg.

End moraines are thought to have been deposited at the edge of ice sheets when forward motion balanced wastage. No fewer than 17 have been mapped throughout the province, although the best known are in southern Manitoba.[10] The Darlingford moraine extends from north of Brandon through the Brandon Hills to the Tiger Hills and east to Pembina Mountain. Further north, The Pas moraine extends south from near The Pas, then eastward between Cedar Lake and Lake Winnipegosis, and on to form Long Point in Lake Winnipeg (Figure 2.4).

Glaciofluvial outwash sediments deposited by glacial meltwater are also extensive. They give rise to flat terrain on which former outwash stream courses can often be seen in air photographs, such as in the area between Pilot Mound and Crystal City.

Glacial Lakes

Some of the most distinctive scenery of Manitoba results from the fact that glacial lakes existed in the area at the end of the Wisconsinan. Evidence for the existence of these lakes takes four forms: strandlines, which mark former lakeshores; spillways, which carried water from one glacial lake to another; deltas, where rivers entered the lakes and deposited sediments; and lake bottom sediments, deposited beyond the immediate shores of the lakes.

Lake Agassiz, the largest of the lakes, probably came into existence about 13,000 B.P. as the result of the merging of a number of smaller lakes (Figure 2.5).[11] It owed its existence to ice damming the northward-flowing, preglacial drainage. With various advances and retreats of the ice, the lake rose and fell so that at different times it emptied south into the Mississippi system,

east into the Great Lakes system, and northwest into the Mackenzie system.[12] Finally the present outlet to the north along the Nelson River became available, leaving Lakes Winnipeg, Winnipegosis, and Manitoba as remnants of the former glacial lake (Figure 1.1.1 on page 6). Other named glacial lakes were Lake Souris and Lake Hind in southwestern Manitoba.

When it was at its highest, Lake Agassiz extended far into the Assiniboine embayment, and strandlines were formed along the Manitoba Escarpment. Beaches of this stage, known as the Herman, are found along the east side of Pembina Mountain and Riding Mountain. At a later date the lake stood at the Upper Campbell level, during which time a prominent beach was formed that extends from the United States border northwest along the Manitoba Escarpment to the Saskatchewan border. Known as the Arden Ridge in the Neepawa area, it determines the southeast-northwest direction of Highway 352 in this area, and is also followed by Highway 10 further north.

The steep-sided, flat-floored spillways are a second piece of evidence for the former existence of glacial lakes. They are occupied by rivers that are misfits, flowing in valleys far too large for the present discharge. The Assiniboine Valley west of Brandon is one example, as is the Qu'Appelle Valley, which joins the Assiniboine near St. Lazare. These valleys provide a startling contrast to the general flatness of the surrounding prairies. They were created, possibly in a very short period, by glacial meltwater flowing from one glacial lake to another.[13] In the south, the Souris and Pembina rivers occupy spillways for much of their length.

Deltas were deposited into the glacial lakes. Elson lists 33 deltas deposited into Lake Agassiz, the largest of which is the massive Assiniboine Delta.[14] A broad preglacial embayment in the Manitoba Escarpment was invaded by glacial Lake Agassiz, and here a delta, with its apex near what is now Brandon, was deposited. The delta extends eastward almost to Portage la Prairie, a distance of approximately 120

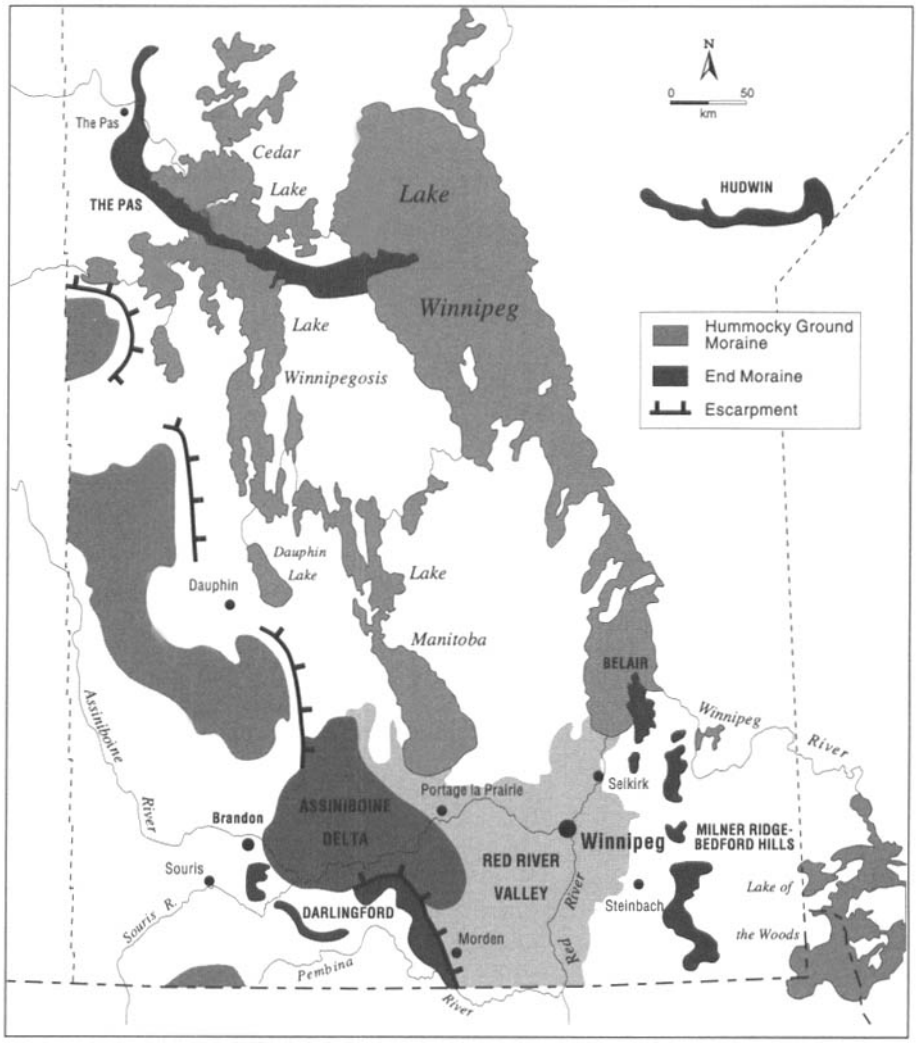

Figure 2.4 Major Glacial Depositional Features of Southern Manitoba (Source: Modified from Geological Highway Map of Manitoba 1994, *2nd ed. [Winnipeg: Manitoba Minerals Division, 1994])*

km, and has a maximum width from north to south of 75 km. The bulk of the sediments in the delta entered Lake Agassiz by way of the Assiniboine/Qu'Appelle system.[15]

The final piece of evidence for the glacial lakes is the existence of lake-floor sediments, principally fine sand, silt, and clay, which cover parts of Manitoba and give rise to flat terrain. Deposition into Lake Agassiz produced the excessively flat land around Winnipeg, north of Portage la Prairie, and around Dauphin and Swan River. Much of the sedimentation is in the form of varved clays, sediments displaying regular alternations of thin laminations and somewhat thicker layers. The alternations may represent seasonal deposition, with the coarse-grained layers being deposited in summer, when the lake was open, and the fine-grained layers accumulating in quiet conditions during the winter, when the lake was frozen.

Isostatic Depression and Rebound

The weight of the ice caused depression of the earth's crust, which rebounded towards its former position once the ice melted. Depression and subsequent rebound was greatest where the ice was thickest. In northern Manitoba the Hudson Bay Lowlands were depressed relative to sea level, resulting in a transgression of the sea (called the Tyrrell Sea) as far inland as 200 km from the present shore of Hudson Bay.

Strandlines formed along the shore and have since been elevated to heights as much as 183 m above

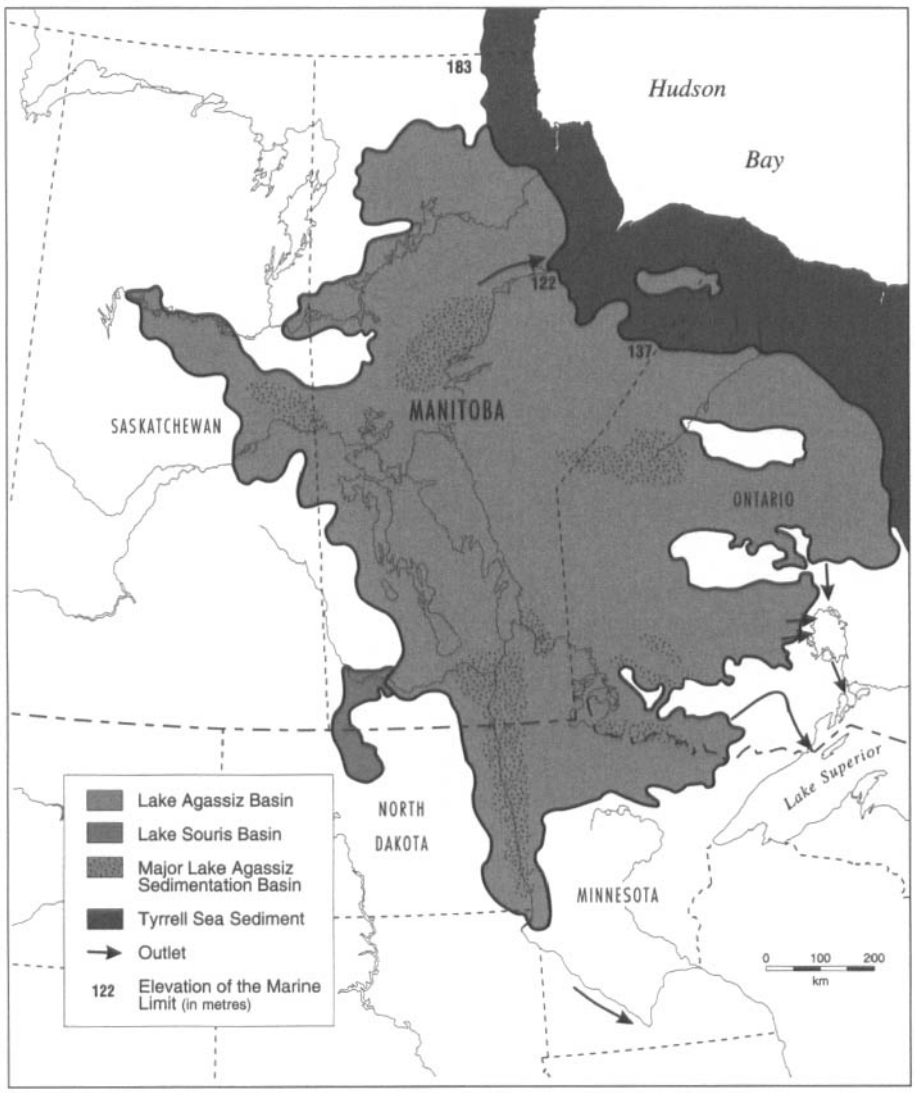

Figure 2.5 The Extent of Glacial Lake Agassiz (Source: E. Nielsen et al. Surficial Geological Map of Manitoba *[Winnipeg: Province of Manitoba, Department of Energy and Mines, 1981])*

sea level on the Manitoba–Northwest Territories border.[16] Further south, the Agassiz strandlines were tilted up to the north; for example, Herman beaches are found at elevations of 389 m above sea level west of Morden but rise to 410 m above sea level west of Neepawa.[17] Also, the upper Assiniboine Delta slopes down to the south as a result of isostatic rebound, so that the modern Assiniboine flows along its southern edge.

HOLOCENE DEVELOPMENT

With the northward retreat of the ice front, the drainage pattern of Manitoba gradually evolved to the present situation, in which the main flow is to the north via the Nelson River into Hudson Bay. Several rivers of southern Manitoba have changed course during postglacial time. Perhaps the most remarkable is the Souris, which once flowed southeast in the direction now followed by the Pembina, but which now takes a sharp turn to the northeast to join the Assiniboine (Figure 2.6). The bend is explained as an elbow of capture, the former Souris having been captured by a tributary of the Assiniboine. Below the elbow, the Souris flows in a series of incised meanders best seen at the village of Wawanesa (Figure 2.7).

In addition, the misfit rivers of southern Manitoba — the Assiniboine, the Souris, and the Pembina — have adopted a meandering form on the floor of the spillways that they occupy. Meander development and abandonment is rapid; the Assiniboine has created 26 cutoffs in the area between the Shellmouth Dam and Portage la Prairie in the hundred years since the first maps of the area were made.

Another Holocene development has been the dissection of the Manitoba Escarpment by small creeks draining to the Manitoba Lowlands. In the Riding Mountain area, "the escarpment slope region is . . . characterized by deeply incised intermittent streams. Stream incisions of between 30 m and 60 m are common."[18] At the base of the escarpment, deposition of eroded shale has produced a series of low-angle alluvial fans. Fans of similar origin occur where small streams flowing from Pembina Mountain reach the lowlands between Morden and Rathwell.

A prominent feature of the landscape of southern Manitoba are sand dunes developed on lake-deposited sediments and on outwash. Most marked are those on the sands of the Assiniboine Delta, which, north of the Assiniboine River, have been blown into dunes of various types. Some, southwest of Epinette Creek, are long, seif-like dunes that trend northwest-southeast. These are now stabilized by a discontinuous cover of vegetation, but in the Bald Head Hills is an area of active dunes with arcuate plans, steep southeast faces, and gentle northwest slopes[19] (Figure 4.1.2 on page 57). Although the area of active dunes has decreased during the past 20 years, it has been calculated that the dunes are moving southeastward at a rate of 20 cm a year.[20] Other, less well-known dune areas are the Lauder Sand Hills on sands deposited into Lake Hind, and an area west of St. Lazare developed on glaciofluvial sands.

PRESENT-DAY TOPOGRAPHY

Manitoba can be divided into four physiographic regions (Figure 2.8), each of which shows the effects of Pleistocene glaciation.

Hudson Bay Lowlands

The Hudson Bay Lowlands consist

Figure 2.6 The Souris Elbow of Capture

Figure 2.7 Incised Meander and an Abandoned Meander of the Souris River at Wawanesa (Photograph: National Air Photo Library [NAPL] A16404-15)

of an undulating plain of low elevation. South of the Churchill River, limestone till covers Paleozoic strata, whereas in the north of the region it overlies the Precambrian. The whole area is overlain by marine clays. In this region of little relief, the major elements of relief are strandlines, former positions of the Tyrrell Sea shore. Additional relief features are the valleys of the Churchill and Nelson rivers, both of which have cut through the till and into bedrock. Erosion by the continental ice sheet deranged the drainage, resulting in a maze of swamps, lakes, and streams. The region is still rising because of isostatic rebound. On 1 July 1757, Samuel Hearne, a Hudson's Bay Company explorer, carved his name and the year into quartzites while sitting by a mooring ring on the shore of Hudson Bay. Today this ring is several metres above the highest tide levels.

Precambrian Shield

The Precambrian Shield is the largest physiographic region, an area of uneven or hummocky terrain. The central part of the Shield is occupied by the Nelson depression or trough, which slopes towards Hudson Bay and is drained by the Churchill, Nelson, and Hayes rivers. Local relief is created by lakes and rivers that are generally entrenched by 15 to 30 m. In northwestern Manitoba the surface of the Precambrian Shield is hilly, with rock outcrops and numerous glacial landforms such as eskers and moraine ridges. The region is covered by the great expanse of boreal forest and thousands of lakes and rivers.

Manitoba Lowlands

The Manitoba Lowlands are the flattest part of the province, relief being generally less than 8 m. The lowlands are located southwest of the Precambrian Shield and are bounded on the west by the Manitoba Escarpment (Figure 2.9). The region is developed primarily on gently dipping Paleozoic limestone and dolomite strata, and has been modified by glacial erosion and mantled by glacial deposits. It is drained by the Saskatchewan, Red, and lower Assiniboine rivers, which cut across the structure of the underlying strata.

Of note in this region are Lakes Winnipeg, Winnipegosis, and Manitoba, all remnants of Lake Agassiz (Case Study 1.1 on page 6). South of Manitoba's Great Lakes, bedrock is deeply buried beneath the silty clays of Lake Agassiz that form one of the flattest and most prosperous farming areas in Canada. In the Interlake region to the north, topography is more bedrock-controlled, with limestone outcrops forming plateaus, rarely more than 30 m high, often covered by a thin layer of glacial deposits. Here the lowland is forested and has extensive areas of muskeg and string bogs.

Throughout most of the region, there are scattered moraines as well as beach ridges of former Lake Agassiz. The Assiniboine River has cut a channel through the sands of the Assiniboine Delta, and is one of many entrenched streams that dissect the region. The top of the Assiniboine Delta has been windblown to form extensive sand dunes that are partially fixed by vegetation (Case Study 4.1 on page 56). In the extreme southeast, towards

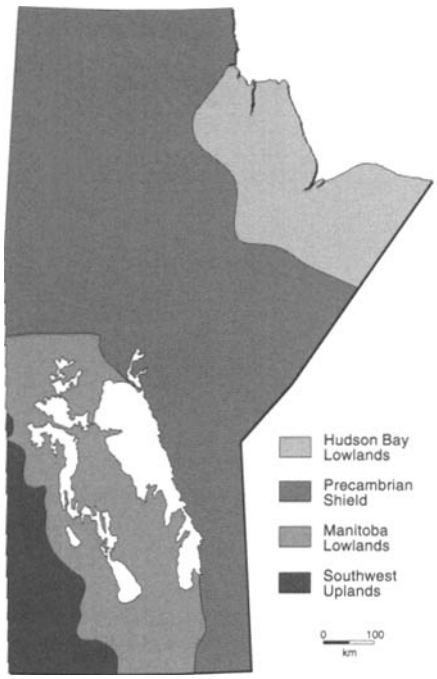

Figure 2.8 Physiographic Regions of Manitoba

Lake of the Woods, sandy morainic deposits impart variable relief and drainage, and large areas are peat bogs and swamp.

Southwest Uplands

The Southwest Uplands form the western edge of the Saskatchewan Plains and are underlain by gently westward-dipping Mesozoic strata. The region is characterized by the Porcupine Hills, Duck Mountain, Riding Mountain, and Pembina Mountain, whose western margins form the Manitoba Escarpment. Between the "mountains" are broad valleys, formed by the work of preglacial rivers much larger than the present misfit streams. The surface of these mountains, which at their highest rise 500 m above the Manitoba Lowlands, is a relatively flat plateau. Bedrock is exposed along the escarpment face, but on the plateaus it is covered by great thicknesses of glacial deposits, reaching 250 m on Duck Mountain.[21]

In the south, Turtle Mountain (757 m above sea level) is an erosional remnant, a topographic feature that remained after erosion had reduced the surrounding area. It is capped by rocks of Paleocene age that are covered by thick (up to 150 m) glacial drift.[22]

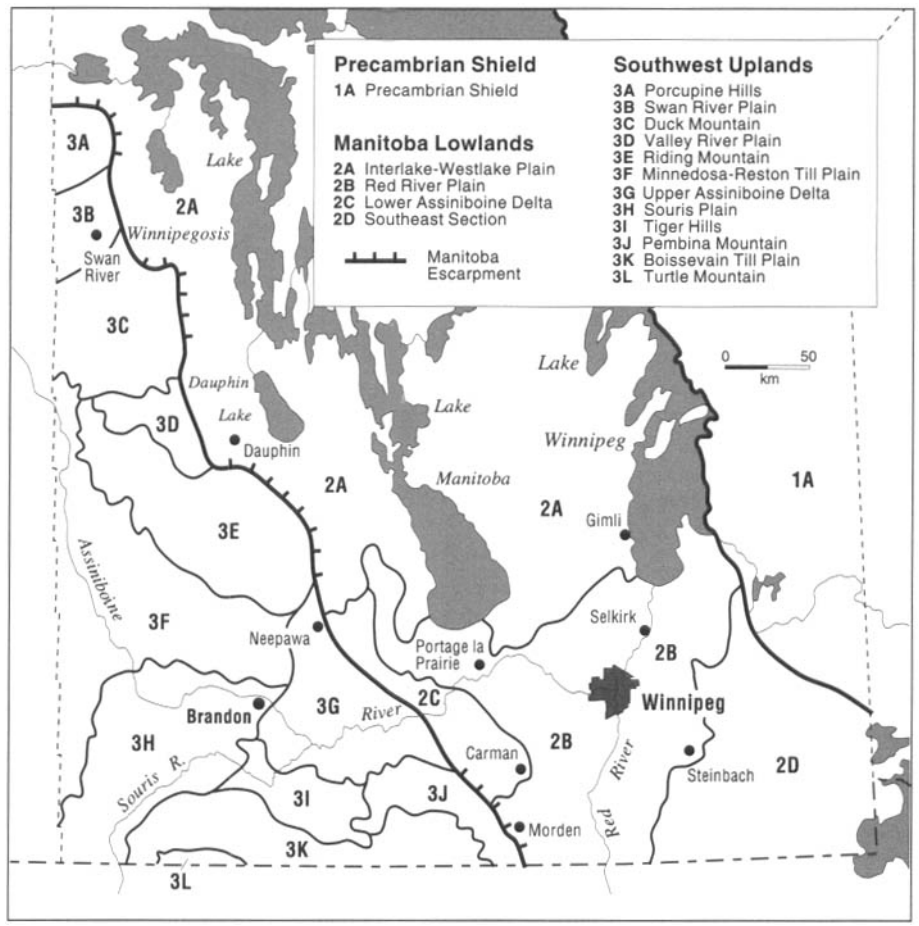

Figure 2.9 Physiographic Regions of Southern Manitoba (Source: After T.R. Weir, ed., Economic Atlas of Manitoba *[Winnipeg: Province of Manitoba, Department of Industry and Commerce, 1960])*

CONCLUSION

The present physiography of Manitoba has been shaped by 3.5 billion years of geological history. Geological activity continued from the early Precambrian volcanism and mountain-building events for a billion years to grind the Precambrian Shield flat, so that the shallow seas of the Paleozoic and Mesozoic could lay down the limestones of the Manitoba Lowlands and the shales of the Southwest Uplands. More recently, glacial periods left a mantle of deposits over much of the province and depressed the land to allow the rivers to run across the Shield to Hudson Bay.

Each event has left its fingerprint on the land. The Precambrian produced early volcanism, left as greenstone belts that have provided areas of mineral wealth. Then the major Kenoran Orogeny about 2.7 billion years ago produced the extensive regions of granite and gneiss that form the bulk of the Superior Province. The cycle was repeated 1.7–1.8 billion years ago, forming the rocks of the Trans-Hudson Orogen in northwestern Manitoba. There followed a long period of general quiescence during which the Precambrian Shield was eroded down to a relatively flat plain that extends far to the west, deep beneath the Rockies.

Throughout the Paleozoic and Mesozoic eras, continental drift placed Manitoba near the equator. At this time the Williston Basin slowly subsided and was filled with carbonate rocks, and newly evolving life forms filled the seas. During the late Mississippian period the sea receded, the waters became brackish and dissolved salts killed off the animal life, and evaporites and the last of the Paleozoic dolomites were deposited. Then the land emerged again from the waters to be partially eroded away. Later in the Mesozoic the seas

returned, bringing more sediments and new life forms in the waters, and land animals appeared in areas at the western edge of the province.

By the end of the Cretaceous and early Tertiary, the land was once again emerging from the seas. The continent of North America slowly drifted northward to its present location. Land animals, many of them mammals, occupied the land, and the stage was set for the Ice Age, during which the details of Manitoba's landscape were produced. Glacial erosion and deposition have produced a variety of landforms. Also, damming of the preglacial drainage by the ice resulted in a number of glacial lakes, which in turn have left behind their own distinctive assemblage of landforms.

The period since the Ice Age is but an instant in geological time. Nevertheless, some details have been added to the physiographic map, such as alterations in river courses, formation of sand dunes, and uplift of glacially depressed areas. The last, at least, continues.

NOTES

1. When lava flows are expelled (extruded) under water, the outer surface of the lava cools quickly, forming a thin crust. Liquid parent lava breaks through the crust to form a series of pillowlike masses. Continuation of the process produces a series of interconnected pillows. The significance of pillow lavas is that they indicate underwater formation.
2. B.B. Bannatyne and J.T. Teller, "Geology of Manitoba before the Ice Age," in *Natural Heritage of Manitoba: Legacy of the Ice Age,* ed. J.T. Teller (Winnipeg: Manitoba Museum of Man and Nature, 1984), 7–21.
3. E. Nielsen et al., *Surficial Geological Map of Manitoba, Map 81-1* (Winnipeg: Province of Manitoba, Department of Energy and Mines, 1981).
4. When the ice sheets were no longer being replenished by snowfall, the ice disappeared by stagnation and downwasting. Sediments contained within the ice were deposited on the land below, resulting in an irregular topography of hills and depressions referred to as *hummocky ground moraine* or *hummocky stagnation moraine.*
5. J.A. Elson, "Surficial geology, Brandon west of principal meridian, Manitoba, Map 1067A," in E.C. Halstead, *Ground Water Resources of the Brandon Map-Area, Manitoba,* Memoir 300 (Ottawa: Geological Survey of Canada, 1960).
6. R.W. Klassen, *Pleistocene Geology and Geomorphology of the Riding Mountain and Duck Mountain Areas, Manitoba-Saskatchewan,* Memoir 396 (Ottawa: Geological Survey of Canada, 1979).
7. Elson, "Surficial geology."
8. Klassen, *Pleistocene Geology.*
9. J. Welsted and H. Young, "Geology and origin of the Brandon Hills, southwest Manitoba," *Canadian Journal of Earth Sciences* 17(1980):942–51.
10. These are mapped and named in Nielsen et al., *Surficial Geological Map of Manitoba.*
11. Ibid.
12. T.G. Fisher and D.G. Smith, "Northwest outlet of glacial Lake Agassiz: the Clearwater–Lake Athabaska spillway valleys," Abstract in *Programme with Abstracts, Third International Geomorphology Conference* (Hamilton, ON: McMaster University, 1993), 139.
13. A.E. Kehow and L. Clayton, "Late Wisconsinan floods and development of the Souris-Pembina spillway system in Saskatchewan, North Dakota and Manitoba," in J.T. Teller and L. Clayton, eds., *Glacial Lake Agassiz,* Special Paper 26 (St. John's, NF: Geological Association of Canada, 1983), 187–209.
14. J.A. Elson, "Geology of glacial Lake Agassiz," in W.J. Mayer-Oakes, ed., *Life, Land and Water* (Winnipeg: University of Manitoba Press, 1967), 37–95.
15. Klassen, *Pleistocene Geology.*
16. Nielsen et al., *Surficial Geological Map of Manitoba.*
17. Ibid.
18. R.A. McGinn, "A general description of the eastern slopes of Riding Mountain" (unpublished manuscript, Brandon University, 1983).
19. W.J. Brown, "Geomorphology Field Trip to Southwest Manitoba," in *Department of Geography, University of Manitoba Field Guide for the Canadian Association of Geographers Annual Meeting, June 1970* (Winnipeg: University of Manitoba, Department of Geography, 1970), 43–71.
20. M.H. Ward, "Vegetative Colonization and Succession and the Impacts of Trampling in the Carberry Sand Hills, Manitoba" (M.Sc. thesis, University of Manitoba, 1980).
21. Nielsen et al., *Surficial Geological Map of Manitoba.*
22. Ibid.

Case Study 2.1
Karst in Manitoba
Geraldine Sweet

"Karst" is a term used to describe landscapes developed both on the surface and underground in regions of soluble rock. Typical features include pavements, depressions, caves, and springs. In Manitoba, throughout the southern Interlake region (the area between Lake Winnipeg and Lakes Manitoba and Winnipegosis) and along the Hudson Bay coast are extensive areas of limestone, dolomitized limestone, and dolostone, all of which are soluble to some degree in acid-rich, terrestrial water. These rocks occur at the surface or are covered by a variable layer of glacial debris. Anhydrite (gypsum),[1] one of the most soluble of all rocks, is exposed around Gypsumville. Although there are probably karst features wherever these rocks occur (Figure 2.1.1), they are masked in the south and in the far north by the glacial overburden. There is evidence of large sinks in the bedrock below the city of Winnipeg, and large infilled cavities have been encountered in cores from the Devonian rocks west of Lake Manitoba.

Surficial karst features are clearly defined, and cave passages reach the surface and can be explored in three regions in the province.

(1) Near Lake St. Martin (Figure 2.1.1), exposures of gypsum result in a well-developed landscape of sinkholes, trenches,[2] and shallow caves. Because gypsum dissolves easily in water, this kind of karst is usually quickly formed and relatively short-lived. The present landscape is thought to be postglacial, the rock being so fragile that the ice would probably have destroyed any surface features. However, in some of the caves there is evidence of intense folding of the bedrock that may have been glacially induced.

Because the rock is so malleable, the caves vary considerably in form, but the most common are long, narrow phreatic tubes,[3] which formed below the piezometric surface (water table)[4] but which are now dry because of a lowering of the local water table. In fact, the longest cave yet found in Manitoba, Labyrinth Cave near Gypsumville, which measures over 180 m, is of this type. Often the tubes intersect, creating small chambers at the intersections. The land surface in the Lake St. Martin area resembles the classic cockpit karst of tropical regions, with many well-developed sinks coalescing, creating a densely pitted surface. The reason for the density of sinks — an indicator of advanced development — is the extremely soluble nature of the rock.

(2) There is some surface expression of karst in the southern part of the Interlake, where the now-famous snake dens at Narcisse are examples of collapse sinks. Water below the surface has dissolved the rock, creating cavities whose roofs have subsequently collapsed. There are much larger depressions of this nature in places like Broad Valley, and farmers throughout the area tell tales of pits and trenches they have filled with rocks.

At Inwood, Stony Mountain, and Garson, the limestone has been excavated for building material, exposing extensive enlarged joint systems in the walls of the quarries, but the main area of cave development is near Dallas, where a number of explorable caves have been discovered. Some are simply long trenches, widened by running water just below ground level, probably during the immediate postglacial period, when running water was more abundant. Some are easily accessible through breaks in the roof. Others are more difficult to find; entrances are typically a small hole, followed by a short drop into the cave proper. St. George's Bat Cave is of this type: it opens out into a sizable cavity about 5 m high and 165 m long. It even has a side passage and some stalactites, formed by secondary precipitation.[5] Altogether eight small caves have been found in this area, and exploration by the Speleological Society of Manitoba is continuing.

(3) The most extensive area of both surface and underground features is between Grand Rapids and William Lake, in the northern

Figure 2.1.1 Location of Karst Areas in Manitoba

Interlake (Figure 2.1.2). Here the bedrock is exposed over hundreds of square kilometres, with only a thin till cover in the lower areas. The result is a region of well-developed karst pavements, so named because the surface resembles paving stones. In places, blocks have subsided or have been dissolved to produce shallow bedrock sinks. In others, deep trenches, or zanjones, are the result of joint enlargement by both chemical and physical processes.

An escarpment marking the boundary between the Silurian and Ordovician outcrops has a series of springs along the base indicating the underground drains of many of the lakes on top of the escarpment. There are numerous collapse features similar to those at Narcisse, and many small, bell-shaped cavities. Caves were first discovered in the northern Interlake by hunters and trappers, but in the last 10 years a plan of exploration by Manitoba cavers has yielded many new cavities, and more are being found each year. Most are found within the top 20 m of the bedrock and range considerably in shape and size, although they are all small by world standards.

There seems to be a pattern to the development of the caves. In most cases the main excavation has occurred in the relatively soft and

vuggy dolostone of the Atikameg unit,[6] part of the Silurian, usually found 1–3 m below the surface and overlain by thinly layered, fine-grained rock. The Atikameg dolostone is easily dissolved and cavities have formed. Later the roof collapsed, and in many cases the cave was enlarged along one or several fractures.

In Dale's Cave, passages are phreatic, having formed below the piezometric surface. Most of the caves are still actively forming, as there is often much water available during spring melt when it is particularly aggressive, and therefore solution is rapid. In early spring Moosearm Pit (Figure 2.1.3) has over a metre of meltwater sitting in it, until ice in the floor melts and the water disappears rapidly, suggesting well-developed drains in the bedrock below. Few of the caves have stalactites, probably because cave formation is still active, but there is some secondary precipitation in the form of the aptly named cave popcorn and dogtooth spar.

Almost all the caves show evidence of physical weathering — frost action — and the bedrock is generally shattered to a depth of at least 30 m. This is the result of postglacial pressure release and may account for the lack of an integrated cave system, as water can move easily almost anywhere in the rock. In the 1960s Manitoba Hydro decided to build a dam on the Saskatchewan River at Grand Rapids (Chapter 18). More than a third of the cost was devoted to grouting the rock in the forebay, to prevent water from escaping underground. Photographs taken at the time show long, wide trenches in the bedrock.

At Steep Rock, on the east side of Lake Manitoba, there are a whole series of "sea" caves. Also, along the shore of Lake Winnipeg, lake water has eroded the carbonate cliffs to create deep undercuts, cavities, arches, and stacks, a type of development found to a greater or lesser extent on the shores of a number of lakes. In addition there are several locations in Grass River Provincial Park and on Clearwater Lake, northeast of The Pas, where large sections of cliff have collapsed, forming cavelike passages. The latter are not really caves, despite the names given them by the Department of Natural Resources, but the collapse has occurred as a result of solutional widening of the natural joints of the rock.

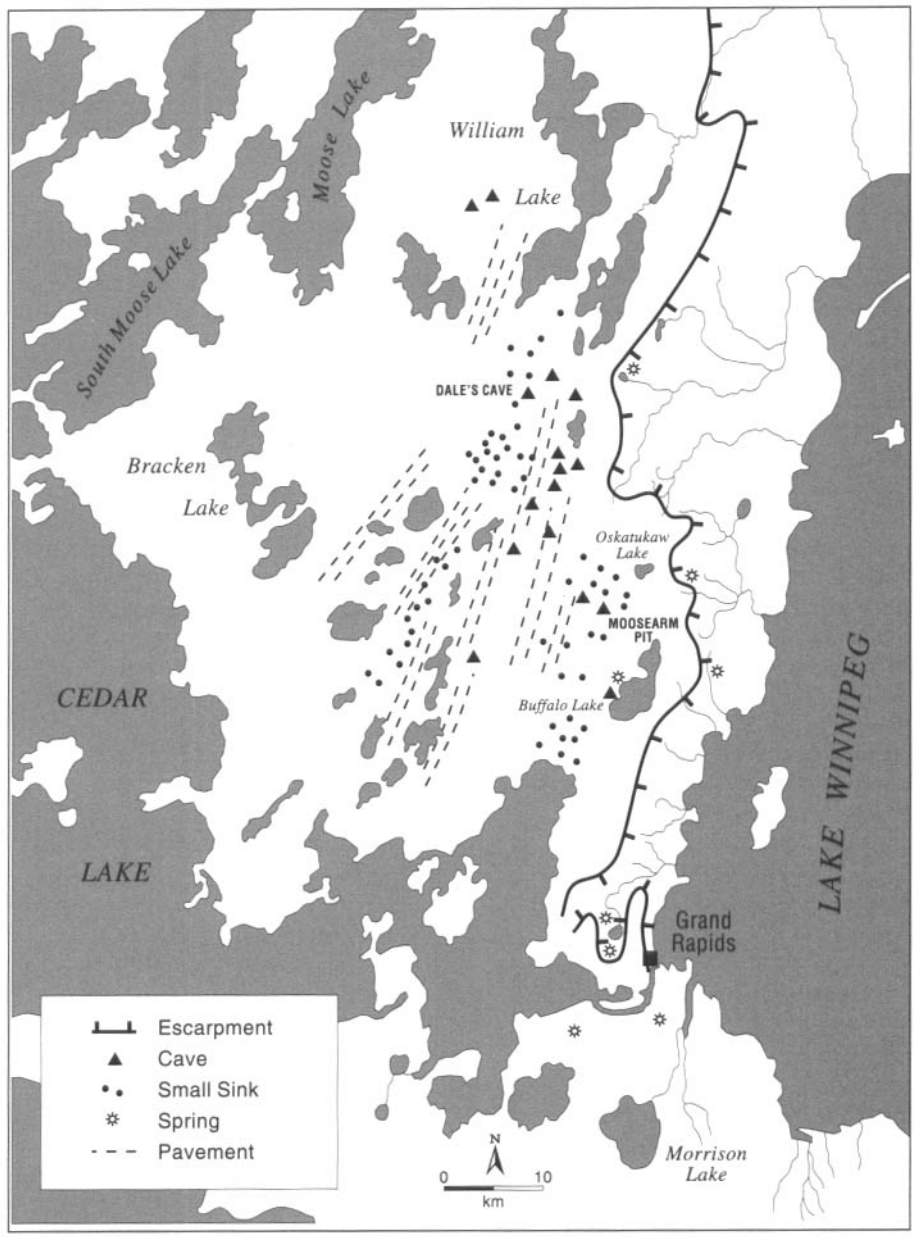

Figure 2.1.2 Karst Features of the Grand Rapids–William Lake Area

Although the caves in Manitoba are quite small, they are geologically, hydrologically, and biologically interesting. So far no evidence of human occupation has been found, other than the odd beer bottle or tin can, but many of them are occupied by colonies of Little Brown Bats (*Myotis lucifus*). Caves have an ambient temperature close to the annual mean of the area, between -2°C and +1°C, so in winter they are warmer than the air; in summer, colder. In many caves the roof is higher than the entrance, so "warm" air is trapped. The bats take advantage of this and hibernate rather than migrate south. Some species of moth do the same. Larger mammals, such as porcupines and bears, sometimes use the caves as dens.

Over a hundred individual caves have been found in the province. Perhaps in the future something larger will be found, as the environment is certainly conducive to karst development. In the meantime, Manitoba's caves provide a second, almost unknown landscape, underground.

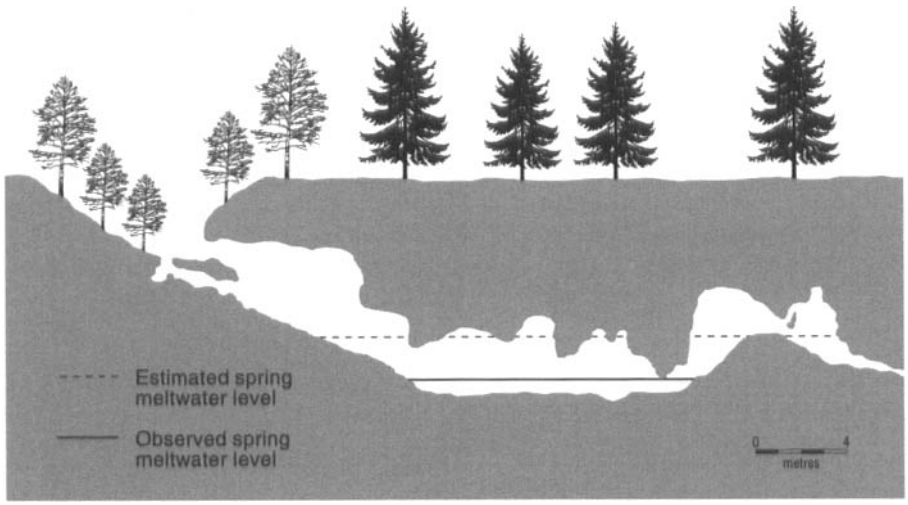

Figure 2.1.3 Cross-profile of Moosearm Pit, in the Grand Rapids–William Lake Area (Source: From a survey by P. Voitovici, G. Sweet, et al.)

NOTES

1. Gypsum is the hydrous form ($CaSO_4.2H_2O$) of anhydrite, a mineral sometimes found in large enough masses to form a rock. It will dissolve in any liquid.
2. Some of these may simply be enlargement of joints. In tropical environments the term "zanjone" is common, and refers to major enlargement by solution and subsequent collapse. Some of the trenches in the northern Interlake exhibit similar characteristics.
3. The terms "phreatic" and "vadose" refer to the location of cavities in relation to the piezometric surface (water table), and hence their method of formation. Vadose cavities are formed when freely flowing water comes in contact with soluble rock; the emphasis is on downcutting, and the upper part of the cavity is frequently above the water. Phreatic cavities form below the water table; the entire surface will therefore undergo solution at the same time, creating round tubes that follow the dip of the rock.
4. A glossary of technical terms in included at the end of this case study.
5. "Speleothem" is the collective name for all forms of secondary precipitation in caves. Speleothems are formed when calcium sulphate–rich waters enter open caves and the pressure release causes deposition that clings to the cave wall in much the same way as the "fur" in a kettle.
6. Different modes of formation produce different fabrics or textures in the rock. Much of the carbonate found in Manitoba was formed in warm, shallow seas, where sediment was trapped in algal mats. The resulting rock is crumbly and full of spaces, or vugs.

GLOSSARY

Zanjone — An enlarged fracture, generally associated with solution of carbonate rocks in the tropics.

Cockpit karst — An area of closely linked depressions with remnant hills between them.

Piezometric surface — The interface between rock containing freely moving water and the saturated stratum (also called the water table).

Cave popcorn — Small growths of calcium carbonate on cave walls and ceilings; a form of stalactite.

Dogtooth spar — Secondary deposition of pure or nearly pure calcium, shaped like teeth.

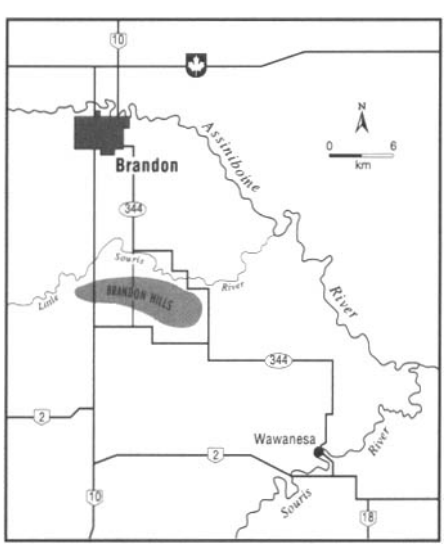

Figure 2.2.1 Location of the Brandon Hills

Case Study 2.2
The Brandon Hills

John Welsted and Harvey R. Young

In an area better known for its flatness than for hills, the Brandon Hills come as a surprise to the outsider. Located approximately 20 km south of Brandon, they rise prominently above the surrounding landscape (Figure 2.2.1). They must "have been a welcome sight for a party of settlers led by the Reverend George Roddick from Pictou County, Nova Scotia, who in May 1879 crossed the Assiniboine at Grand Valley three miles downstream from the present-day Brandon and saw an island of woodland set amidst a sea of waving grasses."[1] Although the surrounding land was soon prepared for agriculture, the hills offered little agricultural potential and have remained an island of natural vegetation surrounded by cultivated land.

Description

The hills run for approximately 12 km in a generally east-west direction, and are about 5 km across from north to south. In places they rise 90 m above the surrounding landscape and reach altitudes of over 480 m above sea level (Figure 2.2.2). Despite their limited area, they show considerable variation in topography, leading us to divide them into four physiographic regions: (1) the main body of the hills, an area of irregular topography with some definite ridges; (2) the eastern ridge, a large, sinuous, generally north-south-trending ridge; (3) the eastern complex, an area of mainly north-south-trending ridges and troughs east of, and adjacent to, the eastern ridge; and (4) the southern ridge, a northwest-southeast-trending ridge.[2]

The main body of the hills consists of a series of subparallel ridges that

trend northwest-southeast in the west, more nearly west-east in the centre, and swing around to become almost north-south in the east. These are mainly wooded (poplar, scrub oak, and Manitoba maple), but some of the more prominent ones have only a sparse grass cover. A profile drawn across them along the hydro road reveals that the topography is hummocky, with the south side of the hills being steeper than the north side (Figure 2.2.3). Glacial till is exposed in the road cuts along this minor highway.

The eastern ridge is quite different. It has been described as looking "as if an enormous dump truck has moved along depositing piles of dirt every few hundred metres."[3] Many do not recognize it as a ridge because most people see it while travelling on Highway 344, from which its steep eastern side is clearly visible, although there is no indication of an equally steep western side. Even the National Topographic Series 1:50,000 map does not show it, which is surprising because it reaches a maximum elevation of 477 m above sea level and is 90 m above the flat land to the east.[4] The view from the top is spectacular, stretching to Brandon in the north, beyond Shilo to the east, and across an old lake floor beyond the small hamlet of Rounthwaite to Wawanesa in the southeast.

The ridge is symmetrical in cross-profile, with slope angles of over 30° (Figure 2.2.4). Slow downhill soil creep has produced small terracettes, clearly visible only when the light is in the right direction. "Draws" or minor gullies on the ridge sides give a scalloped appearance when seen from above (Figure 2.2.5). Gravel pits at each end reveal that it is underlain by well-sorted and layered sands and gravels (glaciofluvial deposits), and borings made into the ridge crest indicate patches of till deposited directly from ice. Large boulders — "erratics" — are found along the ridge crest and sides. They are composed of rocks foreign to the area and can be grouped into two types: granitic boulders, generally spherical and usually covered by dark green lichens; and dolostone boulders, typically slablike and usually covered by bright orange lichens.

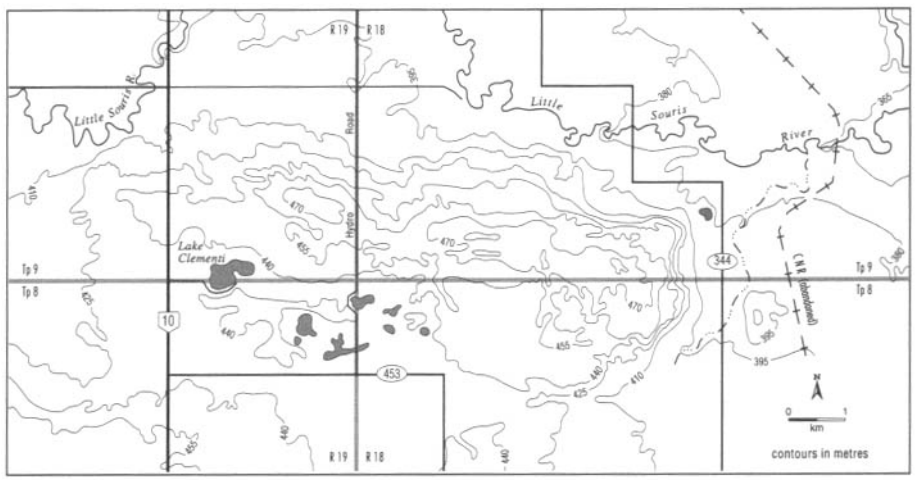

Figure 2.2.2 Topography of the Brandon Hills

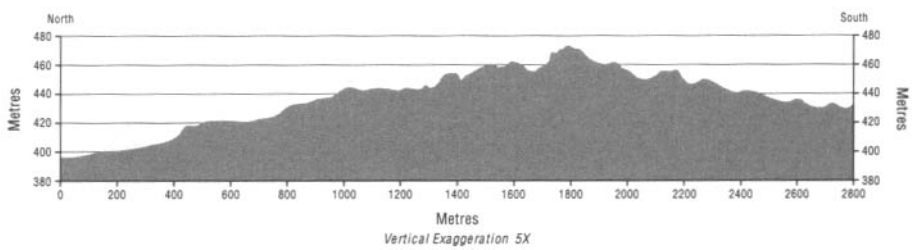

Figure 2.2.3 Topographic Profile along the Hydro Road

The ridge provides marginal conditions for plant growth. It is exposed to wind from all directions, and the permeable nature of the underlying sands and gravels militates against tree growth. Vegetation at the crest is limited to a sparse grass cover that is easily disturbed. However, small, scrubby trees can be found in the "draws" on the flanks, where there is more water and shelter from the wind.

The eastern complex is similar to the eastern ridge in consisting of a series of north-south-trending ridges. These are more obvious on air photographs than on the ground (Figure 2.2.5). They also have grass-covered crests, with trees growing in the intervening troughs. Erratics are common, including the largest we have found in the Brandon Hills, a giant slab of dolostone 3 m long and 1.5 m wide.

The southern ridge is also similar — both on the ground and on air photographs — to the eastern ridge. Erratics are of the same type and occur in the same ratio as on the eastern ridge. However, this ridge is lower (approximately 30 m) and less steep (maximum angles about 20°). It is also much straighter. The southwest (drier) side is grass-covered, whereas the northeast (wetter) side is wooded.

Origin

The Brandon Hills were formed during the last ice age, probably towards the end of the Wisconsinan glacial period. On surficial geology maps of southern and southwestern Manitoba, they are shown as end moraine, part of a system extending from north of Brandon through the Brandon Hills and the Tiger Hills to Pembina Mountain, a system usually referred to as the Darlingford Moraine. The designation "end moraine" suggests that they are composed of sediment deposited at the edge of an ice sheet when it was stationary, forward movement of the ice being balanced by melting. While this interpretation may be generally correct, the single term "end moraine" does not describe all the features of the Brandon Hills.

The main body of the hills is most accurately described as end moraine, but even here there are uncertainties. Beneath the area, the layered and

sorted deposits are clearly of glaciofluvial origin; that is, they were deposited by water in association with ice. These are overlain by till, a true glacial deposit. Initially we believed that the ridges of the main body of the hills resulted from the irregular deposition of till as the ice front receded, but we now believe that they are of glaciofluvial origin and that the overlying till was deposited on preexisting ridges.

Both the eastern ridge and the southern ridge have many of the characteristics of an esker — a landform thought to originate by deposition in tunnels in a glacier or an ice sheet, the deposits being left behind in a ridgelike form when the ice melts. Because the sediments were deposited by running water, they are layered and sorted. The till patches and the scattered erratics on the ridges would have been deposited by the overlying ice as it melted. Both the eastern ridge and the southern ridge can be categorized as eskers, although the eastern ridge in particular is much higher than any other esker mapped in southern Manitoba.[5] The eastern complex is sufficiently similar in both composition and topography to the eastern and southern ridges to suggest that it has a similar origin.

The description of the Brandon Hills as an end moraine can be regarded as the "traditional" explanation. However, an alternative is provided by Aber, who claims that the hills are glaciotectonic in origin. He explains the ridges of the main body as being due to ice thrusting, with great slabs of previously deposited glacial sediment, or bedrock, being pushed forward by the advancing ice. Despite this explanation for the main body, he still regards the eastern and southern ridges as eskers.[6]

Whatever the origin of the Brandon Hills, they are a largely unspoiled landform that has maintained its natural vegetation and that offers a variety of opportunities for the outdoors person.

Figure 2.2.4 The Steep East-facing Side of the Eastern Ridge of the Brandon Hills (Photograph: John Welsted)

Figure 2.2.5 The Eastern Part of the Brandon Hills. The grass-covered eastern ridge (light-toned) crosses the area from north (at the top of the photograph) to south; the eastern complex is located east of the ridge and highway 344 is east of that. (Photograph: NAPL A16408-9)

NOTES

1. J. Welsted and H. Young, "The Blue Hills of Brandon," *Manitoba Nature* (Autumn 1972):32.
2. J. Welsted and H. Young, "Geology and origin of the Brandon Hills, Southwest Manitoba," *Canadian Journal of Earth Sciences* 17(1980):942–51.
3. J. Welsted and H. Young, "The Blue Hills of Brandon," 35.
4. The relevant map is 62G/12 Wawanesa. A survey point located near the centre of the ridge has the exact height 1566.3 feet (477.4 m).
5. Eskers in the Baldur, Notre Dame de Lourdes, and Bruxelles area to the east of the Brandon Hills are commonly in the order of 10 m in height.
6. J.S. Aber, "Spectrum of Constructional Landforms," in *Genetic Classification of Glaciogenic Deposits*, ed. R.P. Goldthwait and C.L. Matsch (Rotterdam: A.A. Balkema, 1989), 281–92; Figure 4.

Case Study 2.3
Evolution of the Lower Assiniboine River

W.F. Rannie

The "Forks" at the confluence of the Assiniboine and Red rivers has become one of Winnipeg's best-known features, the focus of major redevelopment and a source of international acclaim (Case Study 10.1 on page 150). Less well known is the fact that The Forks has not always been at its present location; indeed, there has not always even been a Forks. About 3,000 years ago, The Forks was at St. Norbert, 14 km to the south, where the La Salle River joins the Red, and for several thousand years before that the Assiniboine did not join the Red at all but flowed north from Portage la Prairie into Lake Manitoba. These and other routes of the Assiniboine River are shown schematically in Figure 2.3.1. The cause of these dramatic changes lies with the Portage la Prairie alluvial fan, an unusual feature that, although barely noticeable on the ground, has produced an evolution of the Assiniboine River with few, if any, counterparts elsewhere in the world.

Most alluvial fans are small, steep features composed of coarse materials deposited by multichannel streams with "flashy" (frequently ephemeral) flow regimes in dry climates. The fan constructed by the Assiniboine has none of these characteristics. The river itself is perennial, carries a modest sediment load, and has a strongly meandering single-channel pattern. The fan it has produced has a very low gradient, is composed of relatively fine materials, and is an order of magnitude larger than most other contemporary fans. Only in two crucial respects does it resemble other fans: the radial configuration of channels, and its location at the point where the Assiniboine emerges from its confining valley onto the Lake Agassiz Plain (Chapter 2).

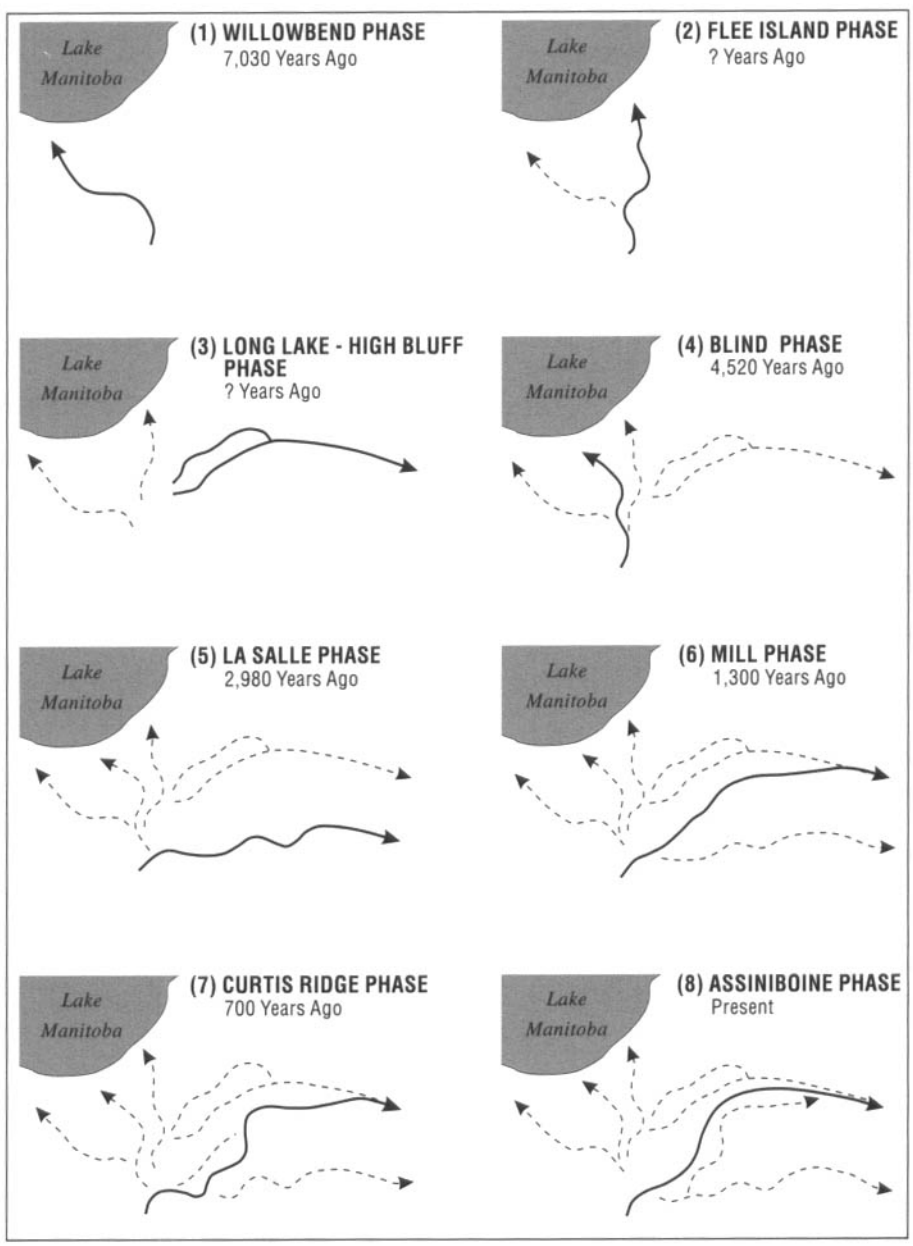

Figure 2.3.1 Evolution of the Lower Assiniboine River

The Portage la Prairie fan was produced by processes normally associated with floodplain formation by a laterally mobile meandering stream. Deposition in and near the river channel repeatedly elevated the river on an alluvial ridge. As it grew higher above the surrounding

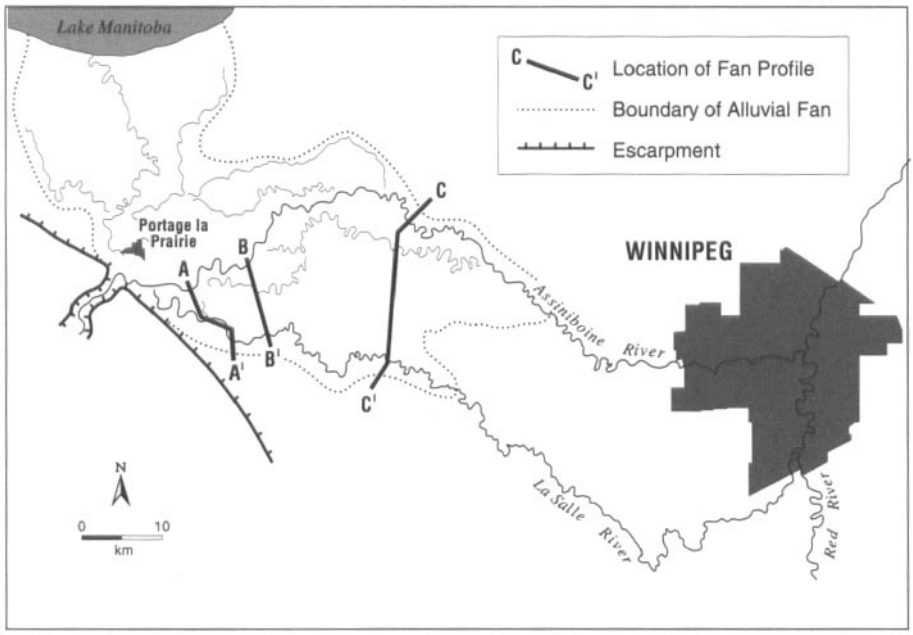

Figure 2.3.2 Paleochannels of the Lower Assiniboine River, Showing the Location of Profiles in Figure 2.3.3

terrain, it became increasingly unstable and was eventually abandoned in favour of a new lower course, a process called *avulsion*. Each of these episodes left an abandoned ridge-channel system, or paleochannel (Figures 2.3.2 and 2.3.3), with features such as scroll bars that show clearly on aerial photographs (Figure 2.3.4).

The initial courses of the river were northward to Lake Manitoba. The oldest paleochannel, Willowbend, was active before 7000 B.P., or shortly after the recession of Lake Agassiz water from the region. Drainage into Lake Manitoba shifted to the Flee Island channel and finally, by 4500 B.P., to Blind channel, which remained active at least until 3400 B.P. As the region between present-day Portage la Prairie and Lake Manitoba became "filled" with sediments and paleochannels, further avulsion exploited lower terrain and steeper gradients to the east, diverting the ancestral Assiniboine away from Lake Manitoba and towards the Red River.

The first eastward route was established by about 3000 B.P. along the channel now occupied by the La Salle River, joining the Red in present-day St. Norbert. By about 1,300 years ago (in the Mill Phase), the lower Assiniboine had shifted northward to join the Red at its present location at The Forks, but differed from its modern course on the fan. The upper fan section of the river was altered again by 700 B.P. in the Curtis Ridge Phase. Thus, the modern route of the Assiniboine from Portage la Prairie to Winnipeg is somewhat less than 700 years old.[1]

Interestingly, maps of the soils in the Portage la Prairie area reflect this evolution. Soils adjacent to the northward channels, being older, display mature chernozemic A horizons (Chapter 4), whereas those south of the present Assiniboine have immature, thin, organic layers, as would be expected in much younger sediments. The shift in outlet from Lake Manitoba to the Red River about 3,000 years ago coincided with a sharp reduction in sedimentation in Lake Manitoba and increased the sediment and water inflow to the Red. Although the sedimentation history of Lake Winnipeg is not known, an increase in the last 3,000 years would be expected.

Until recently, alluvial ridge formation continued to elevate the modern Assiniboine channel on the fan, producing a potential for future catastrophic channel abandonment during large flood events. This potential was greatly reduced in 1970, however, by the opening of the Portage Diversion (Case Study 18.2 on page 283). Located just west of Portage la Prairie, this large artificial channel enables water to be diverted from the Assiniboine to Lake Manitoba to reduce flow through Winnipeg during major floods (and incidentally to reduce flooding on the alluvial fan).

This diversion was possible only because of the elevation of the river provided by the fan near Portage la Prairie. Its value was demonstrated during truly exceptional floods in 1974 and 1976, when much of the alluvial fan and lower terrain would otherwise have been inundated. More importantly perhaps, given the elevated state of the Assiniboine, these floods might have triggered avulsive channel abandonment, which would have required expensive remedial works. Thus, human modification of the flood regime has probably ended the period of active fan formation.

NOTES

1. For more details, see W.F. Rannie, L.H. Thorleifson, and J.T. Teller, "Holocene Evolution of the Assiniboine River Paleochannels and Portage la Prairie Alluvial Fans," *Canadian Journal of Earth Sciences* 26(1989):1834–41; and W.F. Rannie, "The Portage la Prairie `Floodplain Fan'," in *Alluvial Fans: A Field Approach*, ed. A.H. Rachocki and M. Church (Chichester, England: John Wiley and Sons, 1990), 179–93.

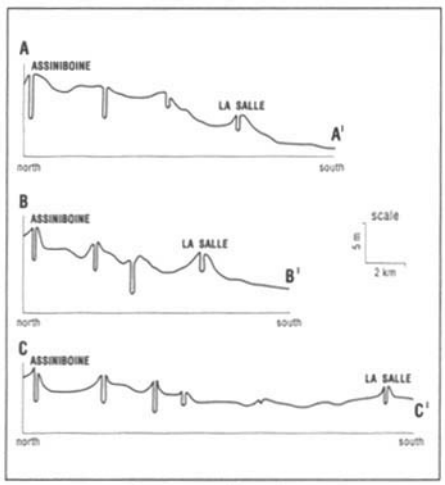

Figure 2.3.3 Cross-profiles of the Assiniboine Fan South of the Assiniboine River, Showing Major Alluvial Ridges

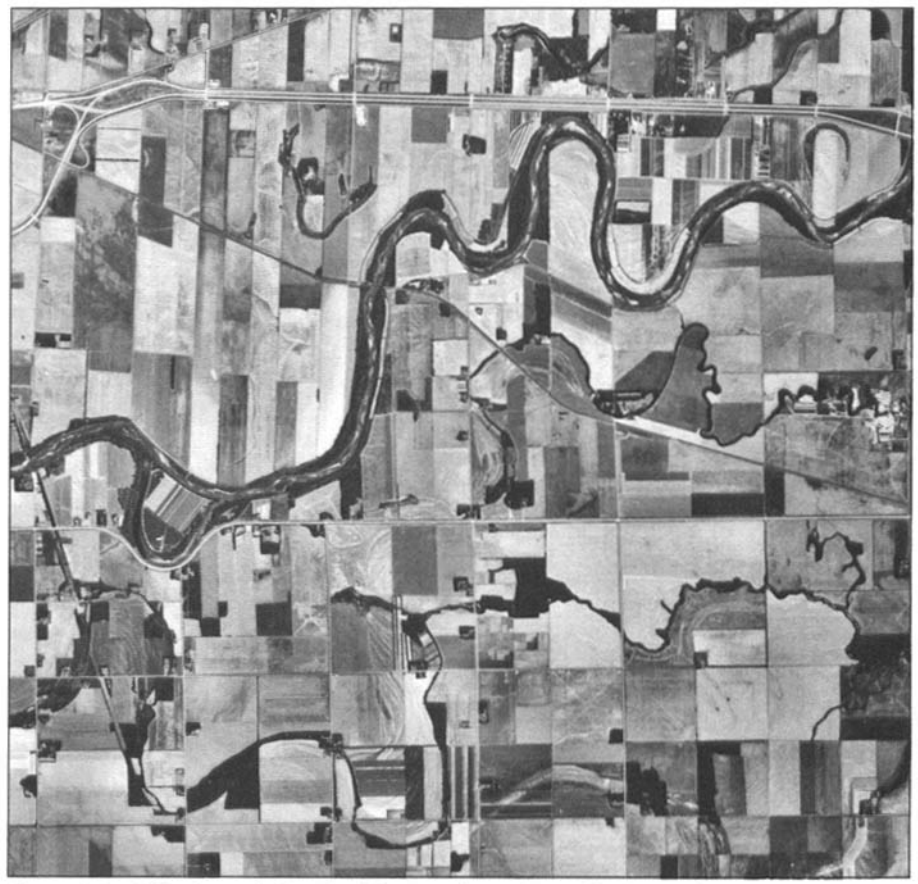

Figure 2.3.4 Paleochannels South of the Assiniboine River. The Trans-Canada Highway crosses the area in the north at the top of the photograph. (Photograph: Manitoba Air Photo Library [MAPL] MB 89021-176)

THE CLIMATE OF MANITOBA

3

Danny Blair

Of all its geographical characteristics, cultural or physical, Manitoba is perhaps best known for its climate. Its long, harsh winters are known far and wide, and the reputation of Winnipeg's Portage and Main intersection as being Canada's coldest corner is legendary (but dubious).[1] Less well known, or at least less well appreciated, is that Manitoba usually has pleasant, and even very hot, weather in the spring, summer, and fall. The climate is, in fact, characterized by variability and extremes, not only in its temperatures but also in its weather in general. It subjects Manitoba to cold snaps, heat waves, droughts, floods, blizzards, thunderstorms, tornadoes, waterspouts, ice storms, hailstorms, and innumerable passages of fronts associated with pressure systems. Because of this variability, there is no doubt that it is one of the world's more interesting climates.

Of course, it is clearly a generalization to suggest that Manitoba has but one climate. It is possible, in fact, to identify a large number of different climatic types within the province's borders. Biogeographical evidence of spatial climatic variability is found in the wide assortment of environmental conditions observed in the province, with grassland, forest, tundra, lake-dominated, and even marine ecosystems each represented (Chapter 4).

Furthermore, if it suits one's purpose, one can also identify and classify different climatic types associated with surface features as small as hill slopes, or valley bottoms, or caves, or parks within a city, or patches of bare ground. In practical terms, however, descriptive climatology, of the sort reported here, does not usually concern itself with these *mesoclimates* and *microclimates,* but instead concentrates on *macroclimates* — those pertaining to large areas in which the prevailing or average weather conditions are not overly dissimilar. For the most part, the average weather conditions in Manitoba are not profoundly different from one part of the province to another, even with respect to important variables related to temperature and precipitation, so it is not totally inappropriate to imply that Manitoba has one climate.

In addition to spatial variation, temporal variation is also clearly evident in Manitoba's climate. Manitoba is located in a part of the world where long-term and short-term temporal variability in the climatic system are both very large. Hence, the concept of average weather conditions has limited value if one does not choose one's averaging periods carefully, and it is important to somehow characterize the variability masked by the averages.

For example, one could calculate the average temperature observed in Winnipeg, but this average by itself would provide very little information to someone who knows nothing about the large temperature variation experienced in Winnipeg throughout the year. As a result, most climatic variables are averaged over monthly periods, but even then it is critical to identify variations in year-to-year monthly averages. Finally, there is also the possibility of substantial climatic

variability from one 30-year period to another. Indeed, in one way or another, all climates, including Manitoba's, are in constant flux. Unless otherwise stated, the data reported in this chapter relate to the period 1961–90, the most recent 30-year period for which normals have been calculated.

MANITOBA'S CLIMATE CONTROLS

Latitude

One of the most important influences on Manitoba's climate is, quite simply, its latitudinal position on the face of the earth. Manitoba is in the northern hemisphere, with its southern boundary at 49°N and its northern boundary at 60°N (Figure 1.1 on page 4). Thus, just over one-half of the province is in the mid-latitudes (35°–55°) and the remainder is in the subarctic (55°–60°). Regardless of how one chooses to classify the province's location, it is important for a variety of reasons.

The total amount of solar radiation that a place on the surface of the earth can theoretically be exposed to during any given time period is first and foremost determined by its latitude.[2] On any given day, the times of sunrise and sunset and the maximum angular distance above the horizon to which the sun rises (i.e., the altitude of the sun at solar noon) are each controlled by latitude. The latitude very strongly affects the amount of solar energy that might be available at the surface to heat the ground, heat the air, evaporate water, or melt snow. In reality, clouds, atmospheric gases, atmospheric particulates, and the slope and orientation of the surface also affect the amount of solar energy incident upon the surface. Also, sunlight that hits the surface does not necessarily get absorbed and converted into heat, but may simply be reflected.

Importantly, the latitude of Manitoba is high enough to produce large differences in day length and solar altitude throughout the year. On the shortest day of the year, at the winter solstice in late December, the southern boundary of Manitoba gets only about 8 hours of daylight (excluding twilight), and at solar noon the sun is only 17.5° above the horizon. At the northern boundary, this shortest day is only about 5.5 hours long, and the sun rises to a position only 6.5° above the horizon. However, on the longest day of the year, at the summer solstice in late June, the southern boundary's day is about 16 hours long and the sun rises to a maximum angle of 64.5° above the horizon; at 60°N this longest day is 18.5 hours long and the sun rises to a position 53.5° above the horizon. This extreme seasonality in the amount of incoming solar radiation (insolation) available to the surface is fundamental to an explanation of why Manitoba's winters are so much colder than its summers.

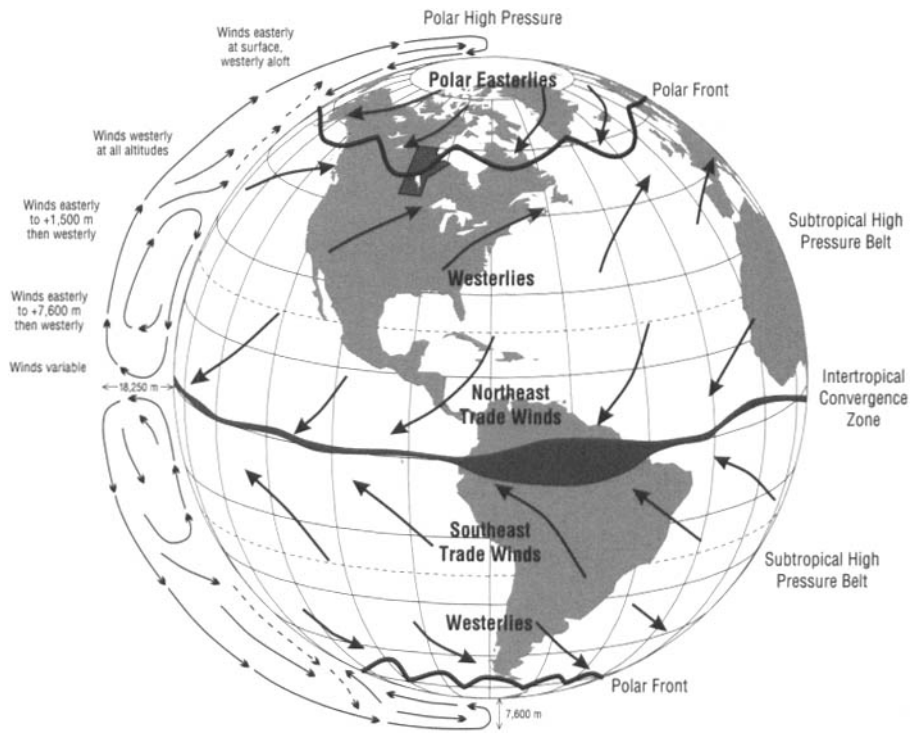

Figure 3.1 Idealized General Circulation of the Global Climate. Manitoba (between 49°N and 60°N) is affected by westerly winds aloft, but winds at the surface are variable. (Source: Modified from H.J. Hidore and J.E. Oliver, Climatology: An Atmospheric Science *[New York: Macmillan Publishing Company, 1993], 150)*

Another reason that the latitudinal position of Manitoba is important is that it puts the province in the belt of global winds known as the mid-latitude westerlies (Figure 3.1). Within this belt the upper tropospheric winds,[3] approximately 5–10 km above sea level, generally flow from west to east. Wind directions at the surface are much more variable, but since the weather systems that produce the surface winds tend to be steered by the upper tropospheric flows, it is reasonable to say that Manitoba's weather typically comes from the west.

This weather is very changeable because the mid-latitude belt is a very dynamic zone, where cyclones (low-pressure systems) and anticyclones (high-pressure systems) of various shapes, sizes, and intensities form and then pass over the face of the earth. As a result, Manitoba's weather is rarely stagnant, but is instead dominated by an endless series of cold fronts and warm fronts embedded within lows and highs, which themselves are embedded within the westerlies.

Relief

Topographic relief is another important factor affecting Manitoba's climate. There are no topographic features that have a significant effect on the macroclimate, for the whole of Manitoba and much of Canada east of the Rockies is essentially a gently sloping concave surface. To be sure, the mesoclimates of the relatively isolated hills along the Manitoba Escarpment (Chapter 2)

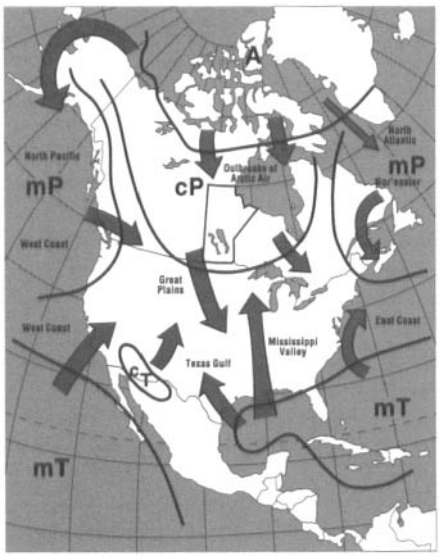

Figure 3.2 Air Masses that Affect North America. Manitoba is located where air masses from many different directions can flow into the province (A = Arctic; cP = continental Polar; mP = maritime Polar; cT = continental Tropical ; mT = maritime Tropical). (Source: Modified from R. McGinn)

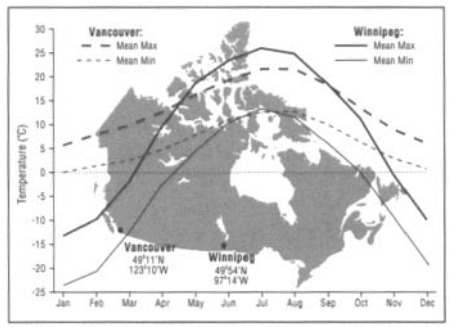

Figure 3.3 Monthly Mean Daily Maximum and Minimum Temperatures in Vancouver, British Columbia, and Winnipeg, Manitoba. The two cities have very different thermal climates, even though they have almost the same latitude.

are affected by the local topography, but in general the province is barren of climatically important terrain.

The most significant consequence of the lack of topography is that it allows air masses from all compass directions to flow into the province effectively unimpeded. In association with the travelling lows and highs, Manitoba can be affected by bitterly cold air masses from the Arctic, mild air originating from the North Pacific, hot and dry airstreams from the American Great Plains, and even tropical flows from the Gulf of Mexico (Figure 3.2). The coincident movements of these air masses, in their various forms, often cause them to collide and mix, thereby producing the frontal activity that is such an integral part of Manitoba's weather and climate.

Continentality

Arguably the most important of Manitoba's climate controls is its continentality, for it is this feature that even further enhances the strong latitudinally controlled seasonality in temperatures. It also contributes to the relative dryness that prevails throughout the province.

Manitoba's "continentality" refers to its position very near the geographic centre of the North American land mass, on the leeward side of the Rocky Mountains, and distant from the modifying influences of large, open bodies of water. A most important effect of this condition is that Pacific air masses that might otherwise be carried eastward into Manitoba by the westerlies are prevented from being so by the terrain, or at least are very much modified by the time they get into the heart of the continent. Manitoba is also very distant from the waters of the Atlantic Ocean to the east, the Gulf of Mexico to the south, and the Arctic Ocean to the north. Hudson Bay certainly affects the climate of northeastern Manitoba, but because the surface of the bay is usually very cold or frozen, its climatic influence is essentially limited to coastal areas.

The lack of direct exposure to Pacific air masses is especially important to Manitoba's thermal regime, for a body such as the Pacific Ocean greatly modifies the temperatures of air masses that pass over it. This is because deep, open bodies of water have large amounts of thermal inertia, which means that their surface temperatures do not change very rapidly or very much; they do not get very cold in the winter or very warm in the summer. This contrasts with bodies of land (or shallow lakes such as Lake Winnipeg and Lake Manitoba), which have little thermal inertia and therefore get warm very quickly in the summer and cool off just as quickly in the winter.

Hence, the position of Manitoba to the east of the Rockies means that relatively cool Pacific air masses are prevented from directly affecting Manitoba in the summer, and relatively warm Pacific air masses are prevented from getting into Manitoba in the winter. The result is that average temperatures in Manitoba are quite high in the summer and quite low in the winter, especially compared to places at similar latitudes along the west coast (Figure 3.3).

Manitoba's continentality is also of consequence to its precipitation regime, for the oceans are not only sources (and sinks) of heat but also sources of moisture. Moist Pacific air masses that pass over the Rockies leave most of their moisture on the windward side of the mountains, so that by the time they get into the Prairies they are much drier than when they entered the continent. This, in conjunction with warming caused by subsidence of the air towards the lower elevations of the Prairies, produces the so-called "rainshadow effect," characterized by a much drier regime on the downwind side of a topographic barrier than on the upwind side. The effect weakens as one gets further downwind of the barrier, but the rainshadow effect induced by the Rockies is strong enough to contribute to the relative dryness of Manitoba's climate. This notwithstanding, much of the moisture that falls in Manitoba is brought into the province in westerly flows originating from the Pacific. Substantial amounts of moisture also come from the south, occasionally with very moist air masses that move northward from the Gulf of Mexico.

CLIMATE ELEMENTS

Temperature

Manitoba's thermal regime is perhaps the most noteworthy and fascinating aspect of its climate. It is capable of exhibiting a remarkable amount of day-to-day, season-to-season, and year-to-year variability, making it one of the most dynamic thermal climates in the world (Case Study 3.1). It is a classic example of a continental climate, with very low temperatures in the winter and very high temperatures in the summer. Still, it is a climate that is able

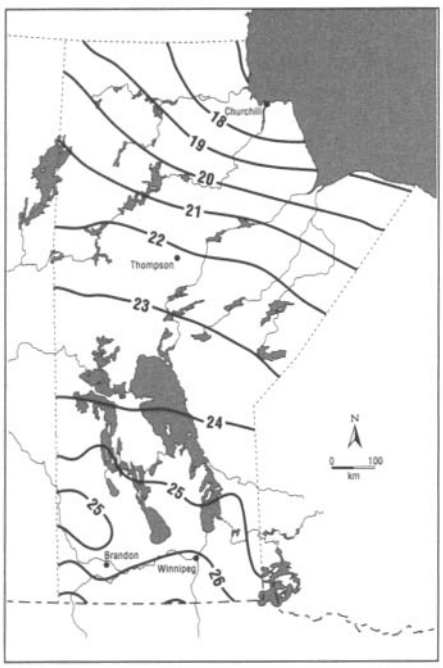

Figure 3.4 Mean Daily Maximum Temperatures in July (°C)

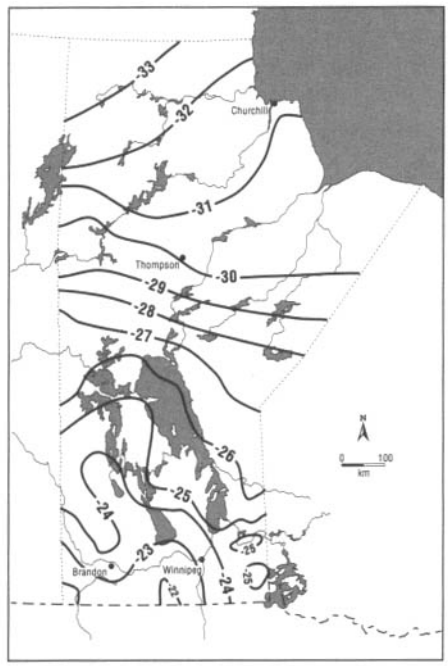

Figure 3.5 Mean Daily Minimum Temperatures in January (°C)

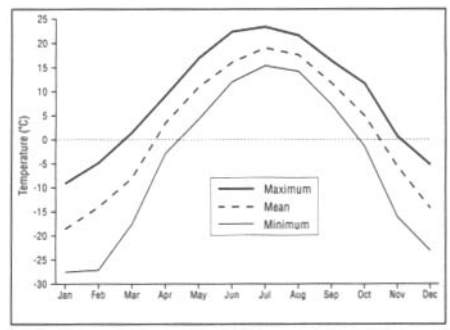

Figure 3.6 Monthly Means of the Daily Mean Temperature at Brandon and the Long-term Extremes (i.e., the coldest and warmest monthly means ever recorded)

to support an abundance of natural flora and fauna (Chapter 4), as well as a very productive agricultural economy (Chapter 15).

On average, the warmest month of the year in Manitoba is July, when the mean daily maximum temperatures range from about 26°C in the south to about 17°C in the extreme north (Figure 3.4). The daily minimum temperatures in July are usually about 12°C or 13°C lower than the daily maximum temperatures, except in the immediate vicinity of large lakes or Hudson Bay, where the moderating influence of the open water reduces the average difference to about 10°C. January is usually the coldest month of the year. Daily maximum temperatures average about -12°C in the south and about -23°C in the north; the normal minimum temperatures range from -22°C to -33°C (Figure 3.5).

The large difference between the average July daily maximum temperatures and the average January daily minimum temperatures clearly indicates that a substantial range of temperatures is experienced throughout Manitoba. In fact, all across Manitoba the difference between these averages is approximately 50°C. However, one must keep in mind that these are long-term monthly averages that hide extremes. If one looks at the record daily maximum and minimum temperatures at individual locations, the temperature ranges are even greater. For example, at Emerson, adjacent to the Manitoba–North Dakota border, the coldest day on record occurred on 9 February 1899, when the temperature plummeted to -46.7°C; the warmest day fell on 12 July 1936, when the mercury rose to 44.4°C,[4] an extreme range of 91.1°C! Most places in Manitoba have long-term extreme ranges between 80°C and 90°C, and extremes of 70°C to 80°C in any 12-month period are typical.

Another method of illustrating variability in Manitoba's thermal climate uses extremes of monthly averages. Consider the long-term monthly mean daily mean temperatures and the lowest and highest monthly mean daily mean temperatures ever recorded in each of the 12 months at Brandon (Figure 3.6). Note that there is considerably more variability in the cold-season months than in the warm-season months, primarily because temperatures of air masses that have access to Manitoba are much more varied in winter than in summer.

On average, there are about 250 days per year when the maximum temperature rises above freezing in the southern part of the province, but only about 170 such days in the extreme north. The average number of days with minimum temperatures less than or equal to 0.0°C is about 200 in the south and 250 in the north. More important than the average number of days with freezing temperatures — at least to the agricultural community — is the average length of the frost-free period.[5] In most of the grain-growing region of southern Manitoba, the average frost-free period is 115–25 days long. However, much to the chagrin of farmers, in any given year there is a substantial risk that the frost-free period will be much shorter than the average.[6] Indeed, late spring frosts and early fall frosts, coming at times when growing or yet-to-be-harvested crops are susceptible to cold temperatures, are significant hazards to agricultural output.

In the far north, well beyond the important agricultural zone, the frost-free period is very short. At Churchill it averages only 76 days, and at Thompson, far from the moderating influence of Hudson Bay, it is less than 65 days long. However, as at more southerly locations, there is a significant amount of year-to-year variation.

The average date of the last spring frost in most of the southern half of the province is in the last week of May, but is as late as the middle and latter part of June in the north. The average date of the first fall frost is about three weeks into September in southern areas, although at many higher elevations in the western part of the province it is usually in the first half of September. In the north, the first fall frost usually arrives in the last half

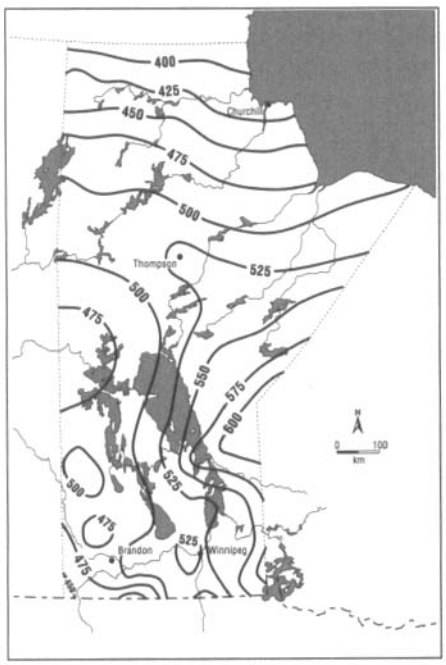

Figure 3.7 Mean Annual Total Precipitation (mm)

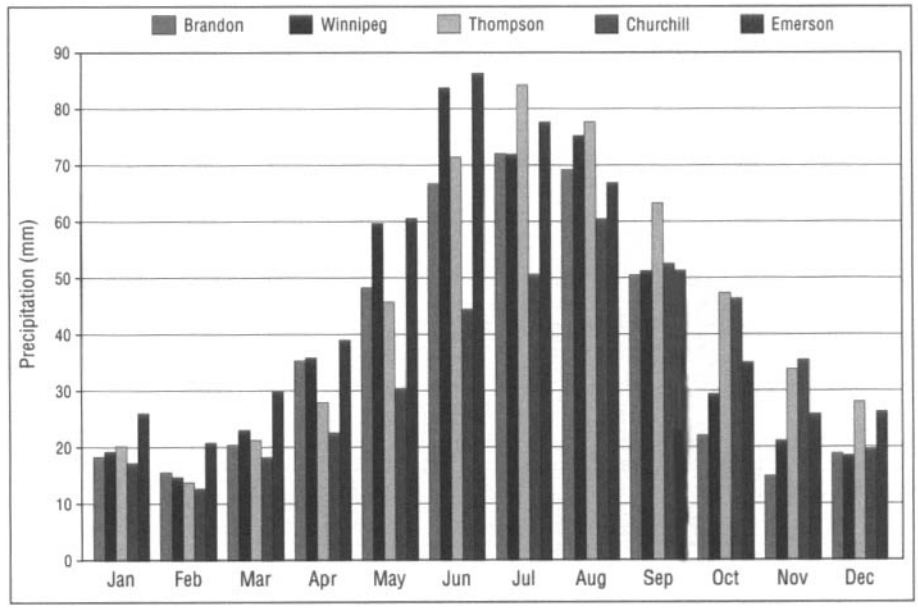

Figure 3.8 Mean Monthly Precipitation Totals at Selected Stations

of August, but not until the first week of September in the immediate vicinity of Hudson Bay. Again, it must be noted that there is a large amount of year-to-year variation in actual dates.

Between the two extreme seasons there are two transitional seasons: spring and fall. Each is short and characterized by rapid changes in average daily temperatures. For example, from the beginning of December to the end of January, the average daily mean temperature at Winnipeg drops by only about 9°C, but in the two months before this — through October and November — it falls by about 20°C! Similarly, through the summer months of June and July, the average daily mean temperature rises only about 5°C, but through the preceding spring months of April and May, it increases by about 18°C!

Rapid changes in average temperatures in the spring and fall are, of course, very much related to very noticeable changes in day length and sunlight intensity, but another important factor is surface albedo. When the winter snowpack is in its final stages of depletion in late spring, there is very often a sudden lowering of the average surface albedo. This promotes ground absorption of sunlight, which promotes higher air temperatures, which in turn encourages further melting of the snow. In the fall, on the other hand, the average surface albedo is suddenly raised after the first general snowfall. The enhanced ground reflection of sunlight helps produce the low temperatures necessary to prevent the snow from melting, keeping the albedo high. Each situation is a classic example of a positive-feedback process.

Precipitation

Manitoba has a fairly dry climate. The relatively wet eastern edge of the southern half of the province receives only about 600 mm of total precipitation in an average year, and most places receive less than 525 mm (Figure 3.7). Total precipitation values generally decrease towards the north and west. The south is wetter than the north primarily because of its more frequent exposure to moist southerly flows originating from the central United States and, occasionally, the Gulf of Mexico. The drier climate towards the west is associated with the extended rainshadow effect produced by the Rocky Mountains.

The precipitation regime is decidedly continental, with the warm months being relatively wet and the cold months relatively dry (Figure 3.8). In fact, most locations receive about two-thirds of their annual precipitation from May to September, inclusive. This temporal distribution is largely due to the ability of warm air to hold more water vapour than cold air, but also to increased atmospheric stability in the winter and a northward shift of the prevailing tracks of low-pressure systems during the warm season, so that they pass over Manitoba. Most precipitation episodes in winter and summer are related to fronts within these travelling lows, and a substantial amount of the summer precipitation falls from thunderstorms.

For most places in southern Manitoba, about 20–25 percent of the annual precipitation falls as snow. Of course, most of this falls in the months when the mean temperature is less than 0°C (November to March). Only in June, July, and August is snow essentially unexpected.[7] In the northern half of the province, only in July and August is snow uncommon, and snow makes up as much as 50 percent of the average annual precipitation. There are about 100 days with measurable precipitation in the south (about two-thirds with rain) and about 150 days in the north (about two-thirds with snow).

Not surprisingly, Manitoba's precipitation records show extreme variation. Daily rainfalls greater than 100 mm have been recorded at many Manitoba weather stations, usually on days in June or July

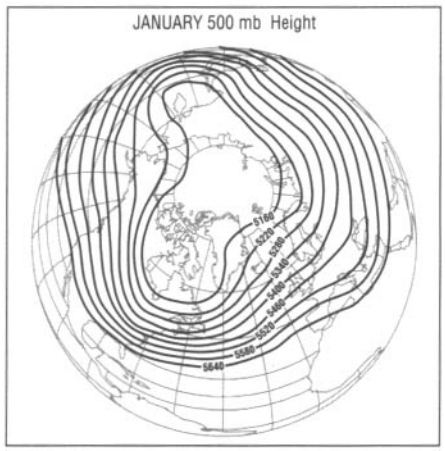

Figure 3.9 Mean 500 mb Height Contours in January (the contour interval is 60 m)

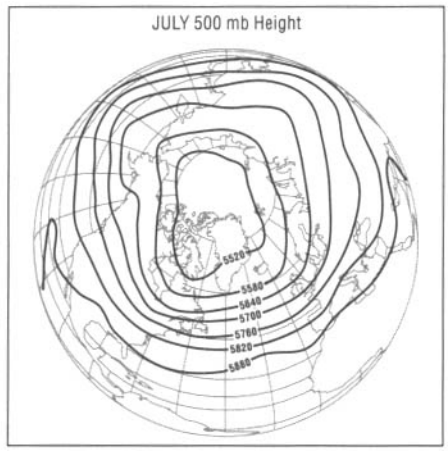

Figure 3.10 Mean 500 mb Height Contours in July (the contour interval is 60 m)

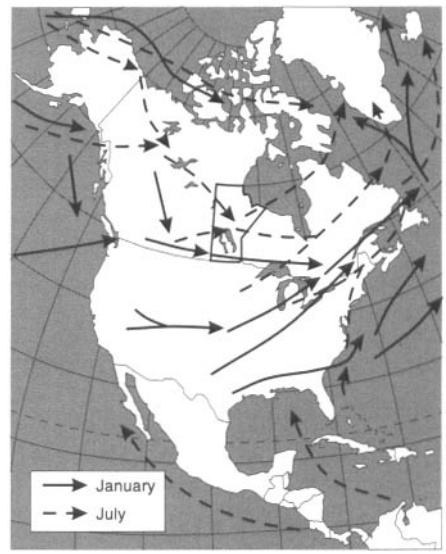

Figure 3.11 Principal Cyclone Tracks over North America (Source: After W.H. Klein, Principal Tracks and Mean Frequencies of Cyclones and Anticyclones in the Northern Hemisphere, *Weather Bureau Research Paper, 40 [Washington: U.S. Department of Commerce, NOAA 1957])*

associated with large thunderstorm events. Some stations have even recorded more than 150 mm of rain on a single day.[8] Impressive daily snowfall totals have also been observed. For example, on 4 March 1966, during the infamous blizzard of '66, 35.6 cm of snow fell on Winnipeg; on 17 May 1978, Churchill received 47.6 cm of snow; and on 12 February 1938, 71.1 cm of snow fell on Minnedosa. Understandably, these communities were essentially paralyzed for days, their major transportation routes plugged with snow.

Extended dry and wet spells, lasting for many days or weeks, are also a common feature of Manitoba's climate. Droughts occur at all times of the year but are especially problematic when they occur in spring and summer, when Manitoba's crops need water to germinate and grow. Extended periods of wet weather are less common but troublesome nevertheless, for they can cause crop damage, urban flooding (Case Study 18.2 on page 283), and increased erosion.

Pressure Patterns and Wind

Pressure pattern variability is a key characteristic of Manitoba's climate, and since winds are driven by pressure patterns, they too are variable. This applies to pressure patterns and winds both in the upper atmosphere and at the surface.

The circulation of the upper atmosphere is well represented by the mid-tropospheric 500 mb level, and January and July conditions can be used to represent winter and summer conditions, respectively. In January, the mean 500 mb height contours over North America feature ridging along the west coast, deep troughing over the eastern part of the continent, and a steep, thermally driven latitudinal height gradient (Figure 3.9). Thus, on average, the mid-tropospheric geostrophic flow over Manitoba in January is strong and from the northwest, where the air is cold and dry.

In July, the latitudinal height gradient is much reduced by a more equitable distribution of insolation, causing the summer westerlies to be much weaker than the winter ones. The North American trough is also much weaker in July, and ridging pushes eastward into the heart of the continent (Figure 3.10). Consequently, the geostrophic flow over most of Manitoba (and central North America as a whole) in the summer is substantially more westerly than in the winter.[9] This results in fewer summer intrusions of relatively cold, dry air masses from the north, and more exposure to relatively warm, moisture-bearing air masses from the west and south.

These seasonal configurations are by no means constant. They evolve and fluctuate from day to day, and over much longer periods of time as well. This variability is especially important to Manitoba, because the upper atmospheric flow has a very strong influence on the type of air masses moving across the province, and on the surface weather in general.[10]

The pressure patterns and resultant winds at the surface are even more variable than those observed aloft. They are especially changeable over periods of a few days as low-pressure systems and high-pressure systems linked with the upper atmosphere track across the province. The prevailing tracks of these surface cyclones (Figure 3.11) and anticyclones (Figure 3.12) affect Manitoba to some degree at all times of the year, but the tracks tend to be further north in summer than in winter. This is because the development of these systems is very much coupled with the pattern, position, and strength of the "jet stream" winds of the upper troposphere.[11]

The jet stream effectively delineates the boundary between the cold air to the north and the warm air to the south. This boundary (the polar front) migrates towards the north in the summer and towards the south in the winter, and so do the average tracks of the surface systems. Also, winter systems (especially cyclones) tend to be more intense than those in the summer because the winter jet stream is usually much stronger than the summer jet stream (because the hemispheric temperature gradient is greater in the winter than in the summer). Frequencies do not vary much throughout the year in Manitoba; the climate is synoptically active at all times of the year, with low-pressure systems and high-

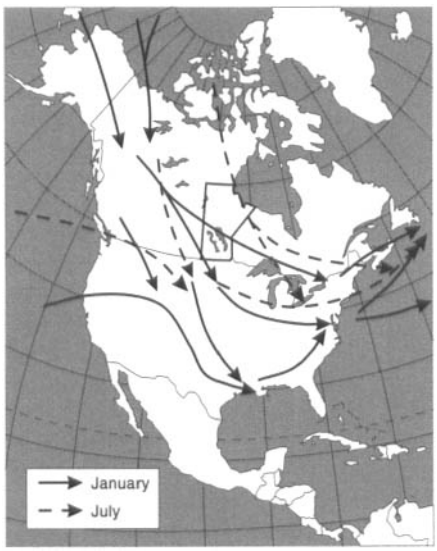

Figure 3.12 Principal Anticyclone Tracks over North America (Source: After W.H. Klein, Principal Tracks and Mean Frequencies of Cyclones and Anticyclones in the Northern Hemisphere, *Weather Bureau Research Paper 40 [Washington: U.S. Department of Commerce, NOAA, 1957])*

pressure systems tracking somewhere through the province every few days or so.

Surface pressure pattern activity is an especially important aspect of Manitoba's climate because it so profoundly affects the nature of day-to-day weather variability. The day-to-day change in surface pressure is not itself very important, but the change in the *pattern* of pressure most certainly is, for the pressure pattern determines the wind pattern. Air near the surface moves upward as it converges on the centre of a low-pressure system, whereas it tends to sink as it moves away from the centre of a high-pressure system. Since vertical ascent causes air to cool and vertical descent causes air to warm, clouds are very often associated with low-pressure systems and clear skies usually accompany high-pressure systems.[12]

The cloud produced within a low is typically most concentrated near two frontal boundaries, one where cooler air in the north pushes into warmer air from the south (the cold front), and the other where warmer air from the south rises over cooler air from the north (the warm front). Of course, if there is enough moisture and lifting within the low, its clouds may produce precipitation. Surface wind directions also vary within the low, as air from all directions converges on its centre. This also means that the temperature of the various air streams converging on the low may be quite variable, as air masses advancing from the north are usually colder — sometimes very much colder — than air masses moving in from the south.

Consequently, as low-pressure systems track across Manitoba, individual locations frequently experience quite changeable weather over periods ranging from hours to days, with the sequence and vigour of the weather changes dependent on the location's position relative to the centre of the low, the position of the fronts, the cloud cover pattern, the precipitation pattern, and the air mass temperatures. Weather is usually much less changeable within high-pressure systems, because fronts are not fostered by the divergent surface winds. However, since surface wind directions vary within highs, as they do in lows, a location's position relative to the centre of the high can greatly affect the temperature of the airstream affecting that location. The variation of surface wind directions in lows and highs also makes it difficult to identify a strongly prevailing wind direction for most locations in Manitoba. In general, however, northerly and northwesterly winds tend to occur more often than any other.

Weather Hazards

Unfortunately, hazardous weather is common in Manitoba. At all times of the year, Manitobans are susceptible to severe weather that can bring normal activities to a standstill, cause severe property damage and economic loss, and injure or kill many people. The list of potentially hazardous weather-related events is remarkably diverse, reflecting the variable nature of the climate as a whole. The hazards include severe cold, severe heat, extreme wind chill factors, frost, blowing dust, blowing snow, fog, windstorms, blizzards, heavy snowfalls, flooding rains, freezing rain, drought, thunderstorm-related wind gusts and downbursts, lightning, hail, waterspouts, and tornadoes. Hurricanes are the only significant weather hazard not in this list!

The event that disrupts normal activities more than any other is the blizzard. To be an "official" blizzard, as defined by Canada's Atmospheric Environment Service, a storm must have a temperature of -12°C or less, a wind speed of at least 40 km per hour, and visibilities of less than 1 km; and these conditions must persist for at least three hours. Highway travel in blizzard conditions is extremely hazardous, not only because of the serious risk of traffic accidents due to reduced visibility but also because of the risk of being stuck in one's automobile for many hours while waiting for help to arrive. It is not uncommon for people to freeze to death after getting lost or trapped outside during a blizzard, particularly when bitter cold accompanies the storm.

Blizzards tend to occur most often in the latter part of the winter, although late fall and late spring storms are a distinct possibility. An average winter produces one or two blizzards for most locations in Manitoba, with slightly higher frequencies in the far north.

Very good examples of the debilitating effects of blizzards were provided by those that struck Winnipeg on 4 March 1966 and 8 November 1986. Each dropped over 35 cm of snow on the city, and winds whipped the snow into huge drifts. For days transportation in and around the city was essentially limited to snowmobiles and snowploughs. Schools and businesses were closed, and millions of dollars were spent to clear snow from streets. Fortunately, these extreme blizzards do not occur very often.

The most costly weather-related hazards are those that lower the yield and value of agricultural crops, for example, droughts, floods, hailstorms, and frosts. Droughts are especially troublesome, resulting in agricultural losses totalling hundreds of millions of dollars at their worst. Like droughts, damaging frosts (either later than normal in the spring or earlier than normal in the fall) can affect very large areas. They are usually not as costly as droughts, but they can greatly affect crop productivity by hindering plant development in the spring and reducing crop quality in the fall. Excessive amounts of surface

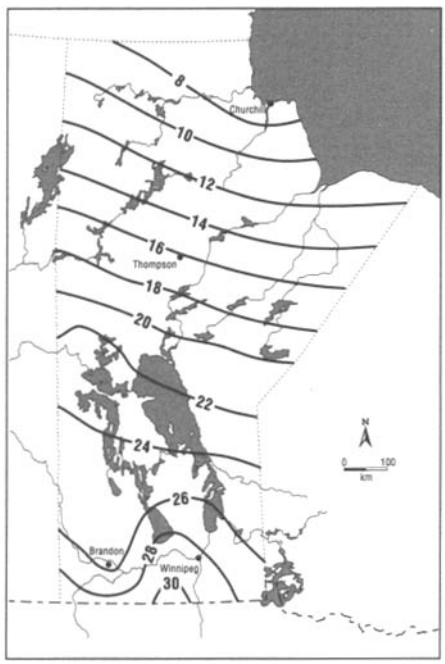

Figure 3.13 Mean Annual Days with Thunderstorms

water tend to be more localized, but they can cause extensive losses by delaying the seeding of crops, initiating soil erosion, and drowning plants. Of course, floods are also a serious hazard to urban areas (Case Study 18.2 on page 283).

Because they produce hail, thunderstorms are another important agricultural hazard. The thunderstorm season in Manitoba generally extends from May to September, with an average of 20 to 30 thunderstorm days per year in the southern half of the province (Figure 3.13). On average, hail falls only about two or three times per year at any one location in southern Manitoba, and the stones are usually quite small. In northern Manitoba the point frequency of hail is only about one per year, and damaging hail is rare. In the south, however, damaging hail is a real, and potentially costly, risk, especially in the extensive grain-growing areas. Individual hailstorms, with hail the size of golf balls or larger, can literally wipe out entire crops in a matter of minutes. In the most severe events, the damage tracks may be hundreds of kilometres long and 10–20 km wide (Figure 3.14). In such storms, hail the size of a golf ball is not uncommon; occasionally it is as big as a baseball, and, very rarely, even as large as a softball.[13]

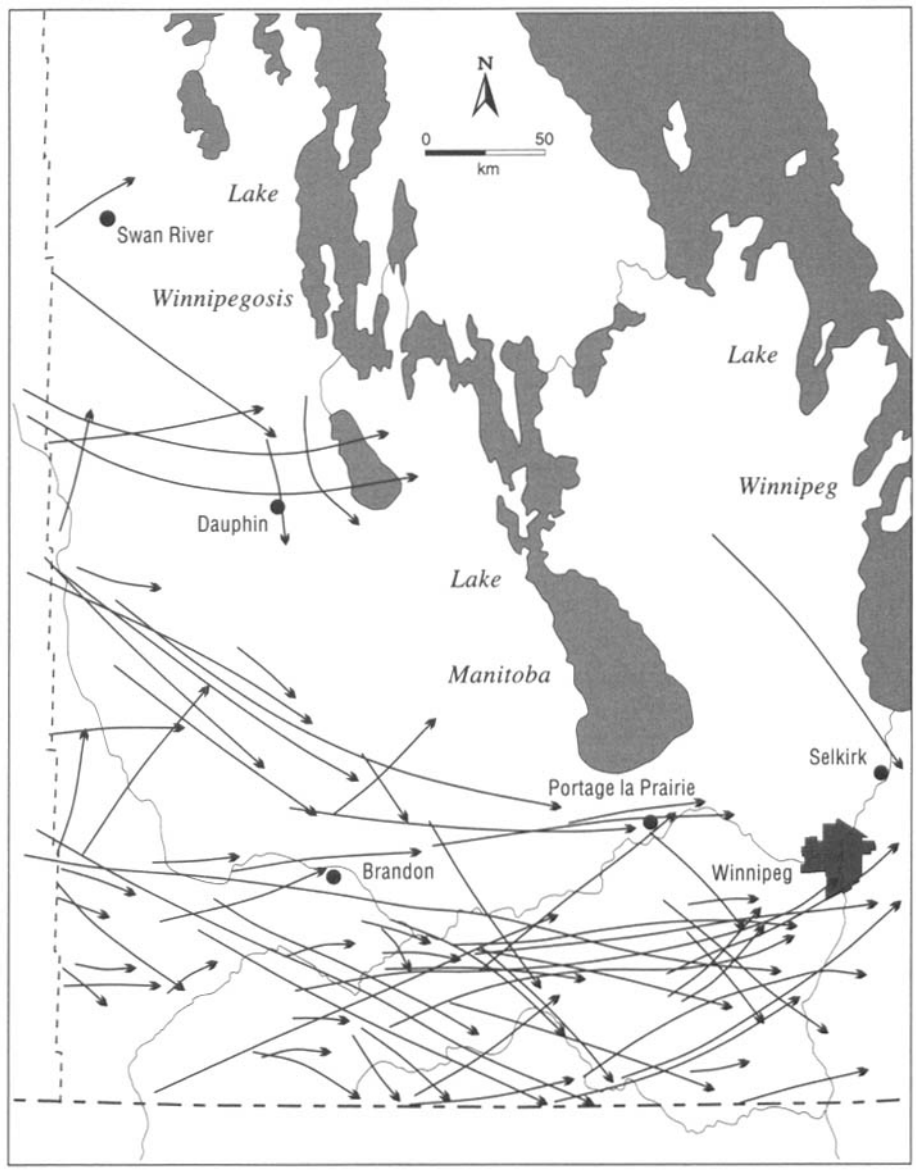

Figure 3.14 Crop Hail Damage Tracks for 50 Severe Hailstorms, 1970-79 (Source: S. Ladochy, "The Synoptic Climatology of Severe Thunderstorms in Manitoba" [Ph.D. thesis, University of Manitoba, Winnipeg, 1985])

Most farmers in Manitoba buy crop insurance that includes coverage for losses due to hail. Hail damage to property is much less common than crop damage, because of the province's relatively sparse population. When the hail is as large as a golf ball, however, it can inflict very costly damage on roofs, windows, and automobiles, especially in towns and cities.

Less common than hailstorms but a serious hazard nevertheless are thunderstorms that produce tornadoes. In an average year six tornadoes are reported in all of Manitoba, most of them in the southern half of the province.[14] In fact, the long-term risk of tornado touchdowns in the Red River region is exceeded in Canada only in the tornado-prone area of southern Ontario.[15] However, injuries, deaths, and extensive property damage are rare in Manitoba because of the low population density. Furthermore, most Manitoba tornadoes are fairly weak compared with their counterparts in the United States and southern Ontario.[16] Nevertheless, it is a sobering thought that the long-term probability of a severe tornado striking Winnipeg is greater than that for Edmonton, Alberta, where 27 people were killed on 31 July 1987.

CONCLUSION

In a word, Manitoba's climate is *variable.* Despite the province's large size and latitudinal extent, the climate is not especially variable *spatially,* but it is extremely variable *temporally.* There are particularly large amounts of seasonal and interannual variability, most importantly in the temperature and precipitation regimes.

Although the climate and weather extremes associated with this variability are interesting and noteworthy for various practical reasons, the reader should keep in mind that the province also experiences very pleasant conditions. In fact, the climate should probably be known more for its frequent and extended periods of sunny, comfortable weather (even in winter!) than for its occasional tantrums. Indeed, patience is most definitely a virtue in Manitoba, for should you not like the weather today, this week, this month, or this year, there is a very good chance that the weather tomorrow, next week, next month, or next year will be quite different, if not better.

NOTES

1. Phillips points out that there are many other places that might more legitimately claim to be the coldest corner in Canada; D. Phillips, *The Climates of Canada* (Ottawa: Environment Canada, 1990), 111. Nevertheless, the buildings at Portage and Main do help to produce some very strong winds that, in conjunction with even moderately cold air temperatures, sometimes produce extremely high wind chill values.
2. Good discussions of the factors that determine the amount of solar radiation that reaches the surface, and methods of calculating intensities, day lengths, and other important variables related to solar radiation, can be found in N.J. Rosenberg, B.L. Blad, and S.B. Verma, *Microclimate: The Biological Environment,* 2nd ed. (New York: John Wiley and Sons, 1983); M. Iqbal, *An Introduction to Solar Radiation* (Toronto: Academic Press, 1983); and E. Linacre, *Climate Data and Resources* (London: Routledge, 1992).
3. A glossary of technical terms is included at the end of this chapter.
4. This is the highest ever recorded in Manitoba; the lowest, -52.8°C, was recorded at Norway House on 9 January 1899.
5. The frost-free period is usually defined as the number of consecutive days in a season in which the air temperature remains above 0.0°C. It effectively represents the time available for crop production.
6. G.H.B. Ash, C.F. Shaykewich, and R.L. Raddatz, *Agricultural Climate of the Eastern Canadian Prairies* (Winnipeg: Environment Canada, Manitoba Agriculture, and the University of Manitoba, 1992).
7. Snow certainly has fallen in the south during June, however. Examples include 15.2 cm of snow in Brandon on 3 June 1901, and 0.3 cm in Winnipeg on 12 June 1969.
8. For example, 171.4 mm fell on Langruth on 11 June 1989.
9. J.R. Harman, *Synoptic Climatology of the Westerlies: Process and Patterns* (Washington, DC: Association of American Geographers, 1991).
10. J.L. Knox and R.G. Lawford, "The Relationship Between Canadian Prairie Dry and Wet Months and Circulation Anomalies in the Mid-Troposphere," *Atmosphere-Ocean* 28(1989):189–215.
11. J.R. Harman's *Synoptic Climatology of the Westerlies: Process and Patterns* (Washington, DC: American Association of Geographers, 1991) is an excellent summary of the thermal and dynamic links between surface and upper atmospheric pressure patterns and flows. Further discussion of the prevailing tracks and average frequencies of cyclones and anticyclones affecting North America may be found in K. Zishka and P. Smith, "The Climatology of Cyclones and Anticyclones over North America and Surrounding Ocean Environs for January and July, 1950–77," *Monthly Weather Review* 108(1980):387–401.
12. A parcel of air cools as it rises because it expands as it moves into an environment where the atmospheric pressure is lower; a parcel of air warms as it sinks because it becomes compressed as it moves into an environment where the atmospheric pressure is higher. Water vapour in the atmosphere condenses to form cloud droplets when the air is cooled to a sufficiently low temperature (the dew point temperature); cloud droplets evaporate when the air is warmed to a sufficiently high temperature (above the dew point temperature). A more detailed discussion of the kinds of weather usually associated with low-pressure systems and high-pressure systems can be found in any introductory physical geography or meteorology textbook.
13. See S. Ladochy, "The Synoptic Climatology of Severe Thunderstorms in Manitoba" (Ph.D. thesis, University of Manitoba, 1985) for a comprehensive discussion of hail and other thunderstorm-related weather hazards in Manitoba.
14. Tornadoes in the forested areas of the north are probably more common than the official meteorological data suggest; many of them probably go unreported because there are so few people there to see them. Indeed, the relatively low population density in Manitoba, and on the Canadian Prairies as a whole, probably results in many tornadoes being unreported (especially the small, weak ones that do not leave behind telltale types of damage).
15. M.J. Newark, "Canadian Tornadoes, 1950–1979," *Atmosphere-Ocean* 22(1984):343–53.
16. According to D. Phillips, *The Climates of Canada* (Ottawa: Environment Canada, 1990), a typical tornado in Manitoba has a path length of 8 km, a width of 15–50 m, and maximum winds of 250 km per hour. Tornadoes in the "tornado alley" of the United States are often much more severe.

GLOSSARY

Adiabatic — Pertaining to the cooling of air that rises and the warming of air that sinks; cooling due to expansion, warming due to compression.

Albedo — The reflective quality of a surface.

Declination — The latitude where the sun's rays are directly overhead at some time during the day.

Geostrophic — Relating to winds that flow parallel to the isobars on a pressure pattern map, or parallel to the height contours on a map of pressure heights; flows with low pressure (heights) on the left in the Northern Hemisphere (looking downwind).

Jet stream — Sinuous, ribbonlike zone of strong winds in the upper troposphere.

Ridging — Situation in which relatively high atmospheric pressure prevails.

Summer solstice — The time when the sun's declination is at its most northerly latitude (23.5° N, the Tropic of Cancer); 20 or 21 June.

Tropospheric — Pertaining to the troposphere, the lowest layer of the atmosphere (about 8–18 km thick; thickest at the equator, thinnest at the poles).

Troughing — Situation in which relatively low atmospheric pressure prevails.

Winter solstice — The time when the sun's declination is at its most southerly latitude (23.5° S, the Tropic of Capricorn); 20 or 21 December.

Case Study 3.1
Battleground of Temperature Extremes

Alan J.W. Catchpole

The southern border of Manitoba is only 80 km north of the geographical centre of North America, located at Rugby, North Dakota. Far removed from the moderating influence of the oceans, the province experiences some of the greatest seasonal changes in temperature found in North America. These seasonal changes are used to calculate indices of continentality, and the index for Manitoba, 60, exceeds those for all other parts of the continent except northeast Saskatchewan and adjacent parts of the Northwest Territories. In the heart of the vast continent of Asia, there are, of course, higher degrees of continentality and indices of 100 are encountered. The difference between these indices indicates that in Manitoba the temperature range between winter and summer is only about 60 percent of the range found in western Siberia.

However, temperatures do not change only in a seasonal cycle, at intervals marked off by months. Within the seasonal cycle, more rapid changes occur over periods of weeks, days, and hours. When we compare the Manitoban and Siberian temperature changes over these shorter intervals, we find that the greatest extremes are in Manitoba. Over periods of days temperatures are apt to soar or plunge much more rapidly here than in Siberia. Why is this so?

The key lies in the broad-scale topographic differences between North America and Asia, and their effects on atmospheric circulation. In North America the great mountain ranges of the Western Cordillera trend north to south and stand in the path of the westerly winds. To the east of the Rocky Mountains, vast lowlands connect the Arctic Ocean with the Gulf of Mexico. The mountains restrict the eastward flow of mild Pacific air, but there are no relief barriers to prevent arctic air from surging down to the Gulf of Mexico, or to block tropical air from sweeping up even to Hudson Bay. Centrally located in this lowland, Manitoba is a battleground for the frontal activity between these free-ranging air masses. By contrast, the mountains that are the backbone of Asia — the Himalayan, Tien Shan, and Altai ranges — stretch from east to west and act as barriers keeping apart the arctic and tropical air masses of Asia.

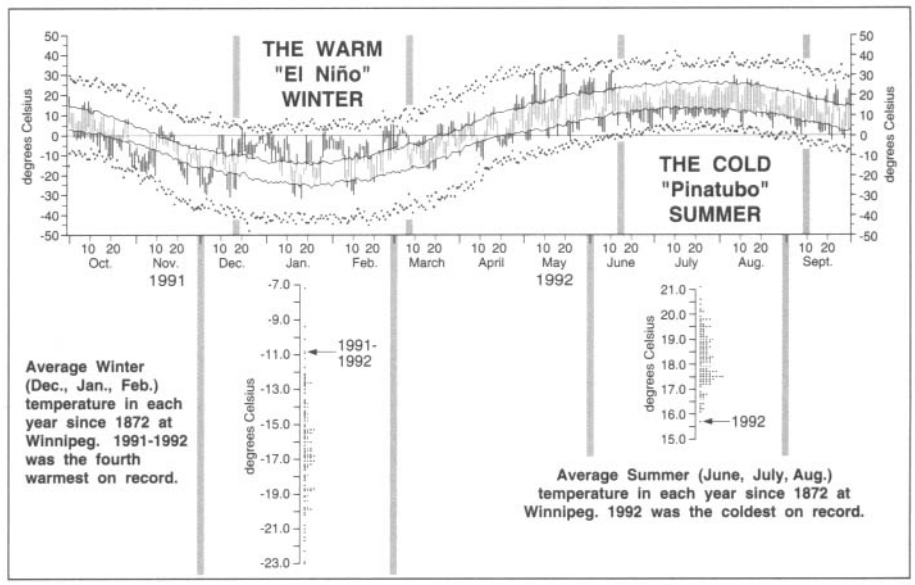

Figure 3.1.1 1992, a Year of Temperature Extremes in Southern Manitoba (Source: Original by Marjorie Halmarson)

Manitobans were given a sharp reminder of their vulnerability to temperature extremes in 1992, when a winter of exceptional warmth was immediately followed by a summer of unparalleled cold. At Winnipeg the winter (December 1991 through March 1992) was the fourth warmest since temperature records began to be kept in 1872 (Figure 3.1.1). The summer of 1992 (June through August) was the coldest ever recorded.

The graph in Figure 3.1.1 reveals the anatomy of the daily temperature changes in Winnipeg between the beginning of October 1991 and the end of September 1992. The dots give the highest and lowest temperatures ever observed on each day of the year since 1872. The irregular continuous lines connect the normal daily maximum and normal daily minimum temperatures. The vertical bars indicate the range of temperature (minimum to maximum) observed on each day. When the daily temperature fell between the normal maximum and minimum, this is shown by a thin vertical bar. Temperatures beyond these normal limits are shown by bold bars.

The most striking anomalies were the prolonged periods of exceptional warmth in winter when the observed daily *minimum* temperatures were far above the normal daily *maxima*. On two occasions (30 December and 1 February) the observed daily *minimum* temperature rose to within 10°C of the highest daily *maximum* temperatures ever observed on those dates. The anomalous warmth was not sustained throughout the winter, being punctuated by more normal temperatures in mid-January and mid-February.

The temperature anomalies in summer followed a different pattern. There was no occasion when the degree of cold was so great that the observed daily maximum temperature was lower then the normal minimum (although this situation was approached at the beginning of July). However, the summer cold anomaly was very persistent, being uninterrupted from the middle of June to the end of July.

How could this cold summer follow so closely on the heels of a remarkably warm winter? Meteorology cannot answer this broad question with certainty, but it can point to possibilities. Global forces that in most regions of the world had only weak effects on surface temperature may have caused profound changes in atmospheric circulation over Manitoba. The warm winter of 1992 coincided with a well-developed El Niño

in the South Pacific Ocean. In previous years this vast expanse of warm sea surface temperatures appears to have strengthened the flow of mild Pacific air across the Rocky Mountains in winter, bringing warm air to the Prairies. It is known that the warm winter weather of 1992 occurred during spells of strong Pacific air flow into Manitoba, and this may ultimately be linked to the El Niño phenomenon.

The other global force at work in 1992 was the worldwide stratospheric dust veil produced by the eruption of Mt. Pinatubo in the Philippines in June 1991. There are indications that volcanic dust veils increase the amplitude of long waves in the upper westerlies in summer, and set the scene for increased southward flows of arctic air to the east of the Rocky Mountains. This was the prevailing pattern of air flow over Manitoba in the summer of 1992, and it may have been triggered by the Pinatubo dust. We cannot say with certainty whether these distant forces caused the weather anomalies in 1992. Only the temperature conditions in Manitoba following future great volcanic eruptions and future El Niño events will provide the answer.

Case Study 3.2
Drought in Manitoba
Timothy F. Ball

Droughts are a significant climatic feature in Manitoba. In the past they created great hardship for the Aboriginal people; today they particularly affect farmers. Any part of the province can experience drought, but the probability is highest southwest of a line from the southeast corner of the province to The Pas, a region that includes the tall-grass prairie and the mixed-grass prairie (Figure 4.2 on page 45), the northernmost section of the Great Plains of North America.

Defining drought is not a simple task because much depends on what is being influenced; thus, drought to one plant may not be a problem for another. Regardless of the specific definition used, however, there is a consistent indication of a shortage of precipitation over a certain period of time. To further complicate the picture, absolute values of precipitation totals are not very helpful in determining the effects of drought on vegetation. For example, a cereal grain such as durum wheat seems to thrive when conditions are relatively dry. It is the timing of the precipitation in the growth cycle of the plant that is important to its effectiveness in producing a crop.

If it is difficult to define drought with modern instrumental records, it is even harder to establish what was a drought from historical records. However, observations in diaries, tree-ring data, and other secondary sources can provide us with a reasonable indication.

The first scientific description of southern Manitoba came from the British-sponsored Palliser expedition of 1857.[1] Palliser identified a triangle, with the United States' boundary as its base and stretching from Alberta to Manitoba, in which he concluded that farming would not be successful (Figure 3.2.1). Many dismiss his report because he travelled the region during a drought. Actually his observations were based on his knowledge of the "Great American Desert" and grasslands to the south, and proved very perceptive.

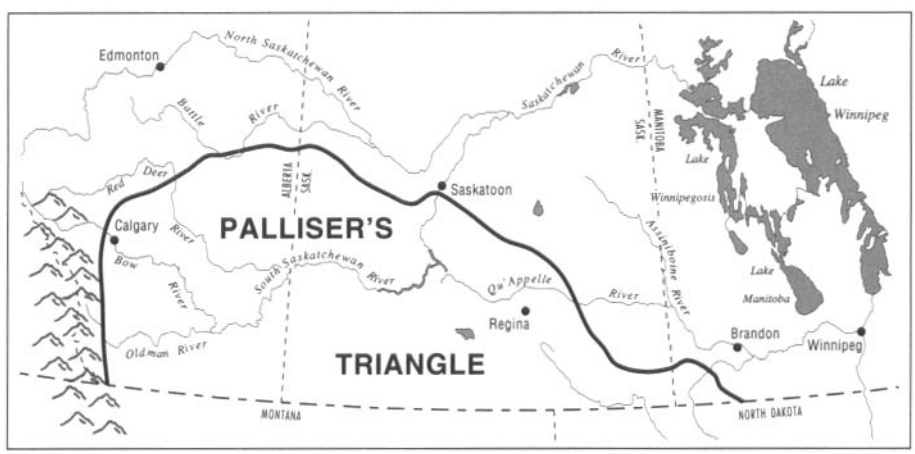

Figure 3.2.1 Palliser's Triangle (Source: R.L. Gentilcore ed., Historical Atlas of Canada: Vol. II, The Land Transformed 1800-91 *[Toronto: University of Toronto Press, 1993], plate 3)*

Henry Youle Hind reported similar conditions during the Canadian-sponsored expedition of 1857–58, and provided an equally pessimistic assessment of the potential. He wrote: "a proper appreciation and use of facts will convince the most sanguine, that the larger portion of this area [the drainage basin of the Saskatchewan River], is, in its present state, unfit for the permanent habitation of man both on account of climate, soil, and absence of fuel."[2] Both explorers were familiar with the literature and climate of the Great American Desert; both believed that the long-term prospects for the region were not good for agriculture.

The relationship between sunspot cycles and the rainfall patterns of the High Plains region of North America has been studied by researchers since the Hale cycle — a 22-year cycle — was first identified by G.E. Hale in 1908[3] and confirmed by Hale and Nicholson in 1925.[4] Indeed, drought cycles for the High Plains region appear to have had a recurrent frequency of 20–22 years for the last approximately 150 years.

A major source of climatic information for central Canada are the extensive records of the Hudson's Bay Company. These include daily weather commentaries and meteorological journals that provide information about the historical climate of the region and that have been studied by several observers.[5] Unfortunately, there are no records of precipitation amounts until well into the 19th century. However, there are

detailed daily commentaries on rainfall events, from which it is possible to obtain counts of the number of days of precipitation in a given month or week.

The first direct reference to drought was in 1772: "Mosses catching fire. Summer a remarkable dry one." The year 1790 was another dry one in the interior, with reference to the Churchill River being very low. The next indication of dry conditions occurs in the winter of 1809–10, when the entry for April notes: "Indians are coming to the Factory and complain much of the plains being bare of snow."

A similar pattern of variable precipitation from season to season between 1800 and 1810 was recorded in the journals for the settlement at Red River. Alexander Henry noted in August 1800 that "The drought has been so great this season that there is no water" in the Plum River. The years between 1816 and 1819 were generally dry, possibly due to extensive volcanic activity that also resulted in severely cool weather in the northern hemisphere. The dry conditions were widespread, and in 1821 William Ross reported that there was not enough water in the Seal River in northern Manitoba to allow a canoe to pass.

Wetter weather then prevailed through to 1837, when drier conditions returned and continued until 1850, with 1846 and 1847 being the driest years. The aridity included the north. A journal entry for February 1844 stated "that the reason why the proceeds of the fishery this season are not so large as those of last, was the dried up state of the shallow lakes where the fish are produced owing to the great drought of last summer."

In 1857 drought and grasshoppers returned to the southern region and continued to 1864, a very hot year with many days over 100°F (37.7°C). The situation was severe, with steamboat travel on the Red River impeded by low water levels, which also prevented water-powered flour mills from functioning. More serious was the fact that seed grain had to be imported from the United States in 1862 and 1865.

The general pattern of 22-year cycles of drought continued to the end of the century. Further west, the situation was more severe in areas of present-day Saskatchewan and Alberta. The 1880s and 1890s also had extremely cold winters and cooler than normal summers. Similar cold and variable conditions were reported in the European record, possibly caused by the eruption of Krakatoa.

The 20th-century pattern of climate and droughts is better known. The correlation of the droughts with those in the High Plains of the United States and with the Hale sunspot cycle suggests that future droughts can be predicted and appropriate action taken to alleviate the resulting stress and offset the socioeconomic damage. Many thousands of hectares within Palliser's triangle should never have been broken for grain farming. Each time there is a drought, we are reminded of this, and yet the more we move away from the extreme period of the 1930s, the more we forget the very hard lessons learned by so many.

The dry 1980s prompted comparison with the mid-1930s. Why, if there are droughts every 22 years, do two droughts approximately 45 years apart warrant particular attention? The answer appears to be that droughts can be classified as either hot or cold. The former have low precipitation and high temperatures, as in the 1930s and 1980s; the latter have low precipitation and low temperatures. Evapotranspiration, and consequently the effectiveness of precipitation, is very different in the two situations.

Hot and cold droughts appear to alternate, which accounts for the 45 years between the hot droughts of the 1930s and the 1980s. Significant settlement in Manitoba began in the late 1880s, after the major period of drought. In addition, the climate was cooled by the effects of the Krakatoa eruption. Thus settlers did not realize the significance of Palliser's and Hind's assessments until the hot drought of the 1930s.

Drought will always be a factor in Manitoba. Initially, advocates of global warming claimed that droughts would increase in frequency and severity with rising temperatures. However, there is no evidence to support this position. In fact, the latest assessments indicate that there will be more precipitation, but the predicted higher temperatures will result in rainfall effectiveness remaining about the same.

NOTES

1. J. Palliser, *The Journals Detailed Reports, and Observations Relative to the Explorations by Captain Palliser . . . during the years 1857, 1858, 1859 and 1860* (London: Parliamentary Papers, 1863).
2. H.Y. Hind, *Narrative of the Canadian Red River Exploring Expedition of 1857 and of the Assiniboine and Saskatchewan Exploring Expedition of 1858* (Tokyo: Charles E. Tuttle, 1860), 354.
3. G.E. Hale, "On the Probable Existence of Magnetic Fields in Sunspots," *Astrophysics Journal* 28(1908):315–43.
4. G.E. Hale and S.B. Nicholson, "The Law of Sun-spot Polarity," *Astrophysics Journal* 62(1925):270.
5. A.J.W. Catchpole, "Historical Evidence of Climate Change in Western and Northern Canada," in *Syllogeus,* ed. C.R. Harrington (Ottawa: National Museum of Natural Sciences, 1980), 47–96; C.V. Wilson, *The Summer Season along the East Coast of Hudson Bay during the 19th Century* (Toronto: Canadian Climate Centre Report 82–4, 1982); J. Guiot, *Reconstruction of Temperature and Pressure for the Hudson Bay Region from 1700 to the Present* (Toronto: Canadian Climate Centre Report 86-11, 1986); T.F. Ball, "Climate Change, Droughts and their Social Impact: Central Canada, 1811–20, a Classic Example," in *The Year Without a Summer?* ed. C.R. Harrington (Ottawa: Canadian Museum of Nature, 1992); T.F. Ball, "Historical and Instrumental Evidence of Climate: Western Hudson Bay, Canada, 1714–1850," in *Climate Since A.D. 1500,* ed. R.S. Bradley and P.D. Jones (London: Routledge, Chapman and Hall, 1992), 40–73.

MANITOBA'S ECOCLIMATIC REGIONS

4

Geoffrey A.J. Scott

Although humans have an enormous potential to modify natural ecosystems, many human activities are both stimulated and/or limited by constraints imposed by the ecosystem or climate. Whereas much of southern and west-central Manitoba has already been drastically modified during the last century by agriculture, grazing, forestry, and urban development to the point that its original natural-vegetation covers are hardly recognizable, many other regions in the north and northeast appear quite pristine. An appreciation of the great variety presented by Manitoba's soils and biota is therefore valuable background for any discussion of human activities in the province, and this is best gained by reviewing all major natural ecosystems[1] within Manitoba's ecoclimatic regions.

Ecoclimatic regions are "broad areas of the earth's surface characterized by distinctive ecological responses to climate, as expressed by vegetation and reflected in soils, wildlife and water."[2] At a more general level, ecoclimatic regions are hierarchically grouped into ecoclimatic provinces, and portions of 4 of the 10 Canadian ecoclimatic provinces — the Grassland, Boreal, Subarctic, and Arctic — are found in Manitoba (Figure 4.1).[3] Because of their large size and internal variation, these provinces are subdivided into ecoclimatic regions, and 8 such regions are represented in Manitoba.

As the definition implies, each ecoclimatic region has its own characteristic combination of soil types, vegetation cover, and wildlife that makes it distinct from any other region. Ecoclimatic regions therefore include communities that can be described by their potential natural-vegetation cover using traditional terms such as prairie, aspen parkland, boreal forest, tundra, wetlands, etc. (Figure 4.2). As might be expected, a comparison of Figures 4.1 and 4.2 shows a marked similarity in major boundaries, reflecting the primary consideration given to vegetation cover in delimiting ecoclimatic regions. Likewise, a comparison of vegetation and soil distributions (Figures 4.2 and 4.3) confirms the strong relationship between vegetation zones and soil types.

It is the overall role of climate, however, that accounts for the northwest-to-southeast orientation of Manitoba's major ecoclimatic regions and zonal vegetation and soils. Types of vegetation cover and the distribution of freely drained soils correlate strongly with increasing moisture availability as precipitation increases from west to east (Figure 4.4), and also with increasing effective precipitation as one moves from south to north.

Wetlands, however, do not conform to this climatically determined zonal distribution of vegetation and soils, because poor drainage rather than climate is more important in determining their location. Because wetlands cover 41 percent of Manitoba, and because all five Canadian wetland classes (fens, bogs, marshes, swamps, and open shallow water) are encountered here, the following discussion would be incomplete if their characteristics were omitted.[4] It is also important to note that vegetation zonation throughout the province has had but the short span of postglacial time in which to develop

and stabilize, and that even this short period has been marked by climatic changes sufficient to move vegetation zone boundaries a hundred kilometres or more in just the last 3,500 years alone.[5]

THE TRANSITIONAL GRASSLAND ECOCLIMATIC REGION

Most of southwestern Manitoba is part of the Transitional Grassland Ecoclimatic Region, a zone where moisture deficits are sufficiently large that woody species are generally stressed and herbaceous (grassland) species favoured. Some exceptions include treed pothole/lake fringes and riverine gallery forests, where abundant ground water is found. In terms of traditional natural-vegetation zonation, this region is called the prairie (Figure 4.2).

Before agricultural settlement, prairie grassland was exceptionally well adapted to the stressful climate, with its droughts, fires, strong winds, and herds of grazing and soil-compacting plains bison. (Official binomial names of plant and animal species are found in Appendices 4.1 and 4.2, respectively). In addition, both the palatability of the herbaceous cover and a huge soil biota favoured rapid nutrient recycling with little litter buildup. The limited leaching potential of the subhumid prairie climate, combined with humification of the enormous annual production of fibrous rooting systems, has promoted both nutrient- and humus-rich topsoils over postglacial time — the classic Black Earths or Chernozems (Figure 4.5).[6] These Black Chernozems have been shown to be ideal for production of cereals and oilseeds, two groups of domesticated species well adapted to drier and sunnier mid-latitude continental summer conditions. Much of the recent history of this ecoclimatic region has therefore been one of almost total prairie conversion by the plough, or alteration to pasture (Chapter 15).

Before the arrival of European agriculture, the herbaceous cover provided ideal habitat for many species of wildlife. Inevitably such a subhumid climate was also conducive to the production of late summer herbaceous cover die-back,

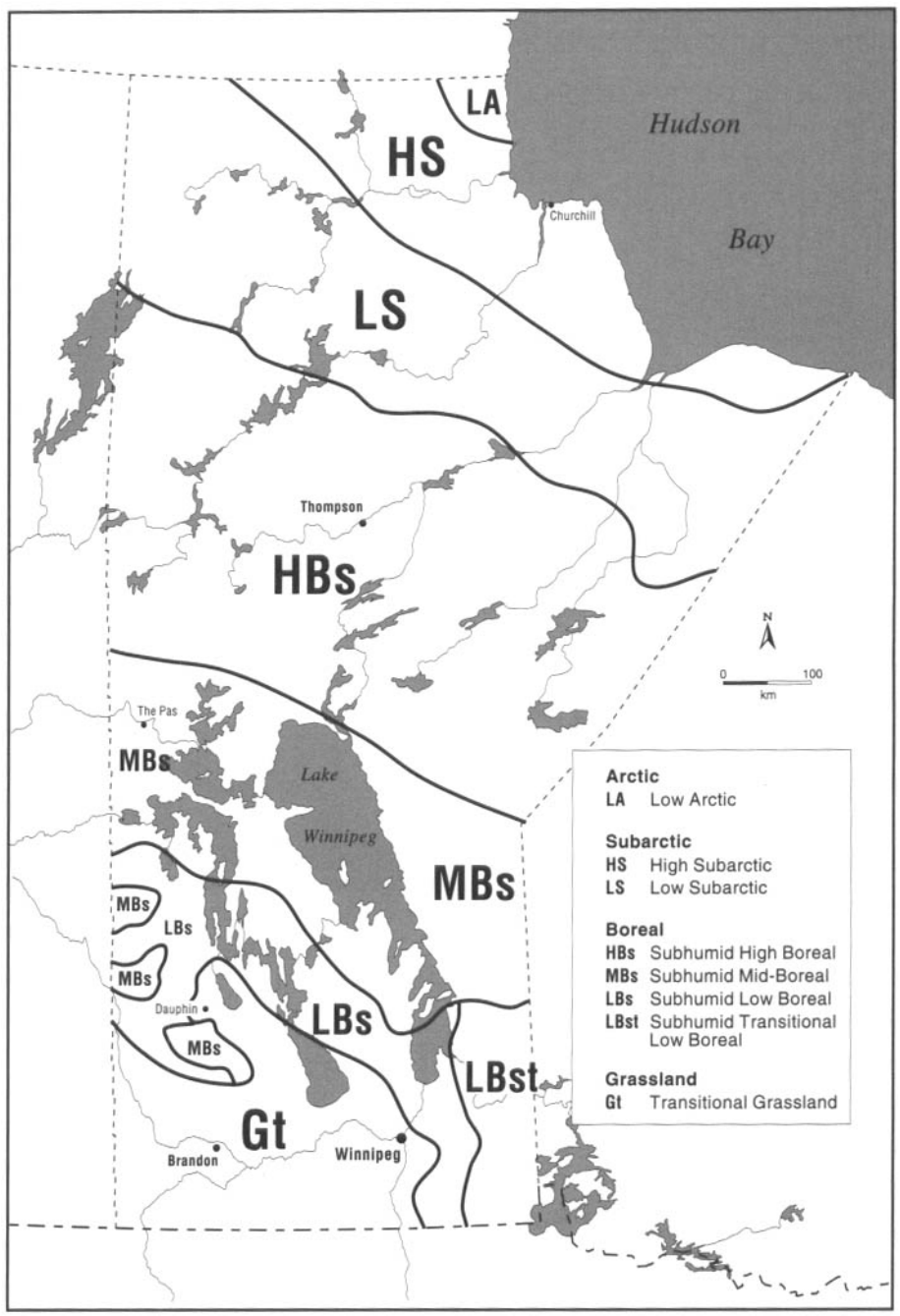

Figure 4.1 Ecoclimatic Zonation in Manitoba (Source: Ecoregions Working Group, Ecoclimatic Regions of Canada, First Approximation *[Ottawa: Environment Canada, Ecoregions Working Group of the Canadian Committee on Ecological Land Classification Service, Conservation and Protection, 1989])*

making many communities susceptible to fire. As a result this region is associated with a long history of both human- and lightning-induced burning, which has influenced the dominant biota of the region as well as soil development.

Perennial grasses are especially suited to spring or summer burning, sprouting soon afterwards and offering fresh browse for herbivores such as bison. Because of the many different types of cover, habitats, and biotic conditions represented throughout this prairie or Transitional Grassland Ecoclimatic Region, it can be readily subdivided on the basis of dominant vegetation cover into three major ecosystem types: mixed-grass prairie, aspen parkland, and tall-grass prairie.

Mixed-Grass Prairie

Manitoba's mixed-grass prairie has been greatly reduced in size during the last century because of en-

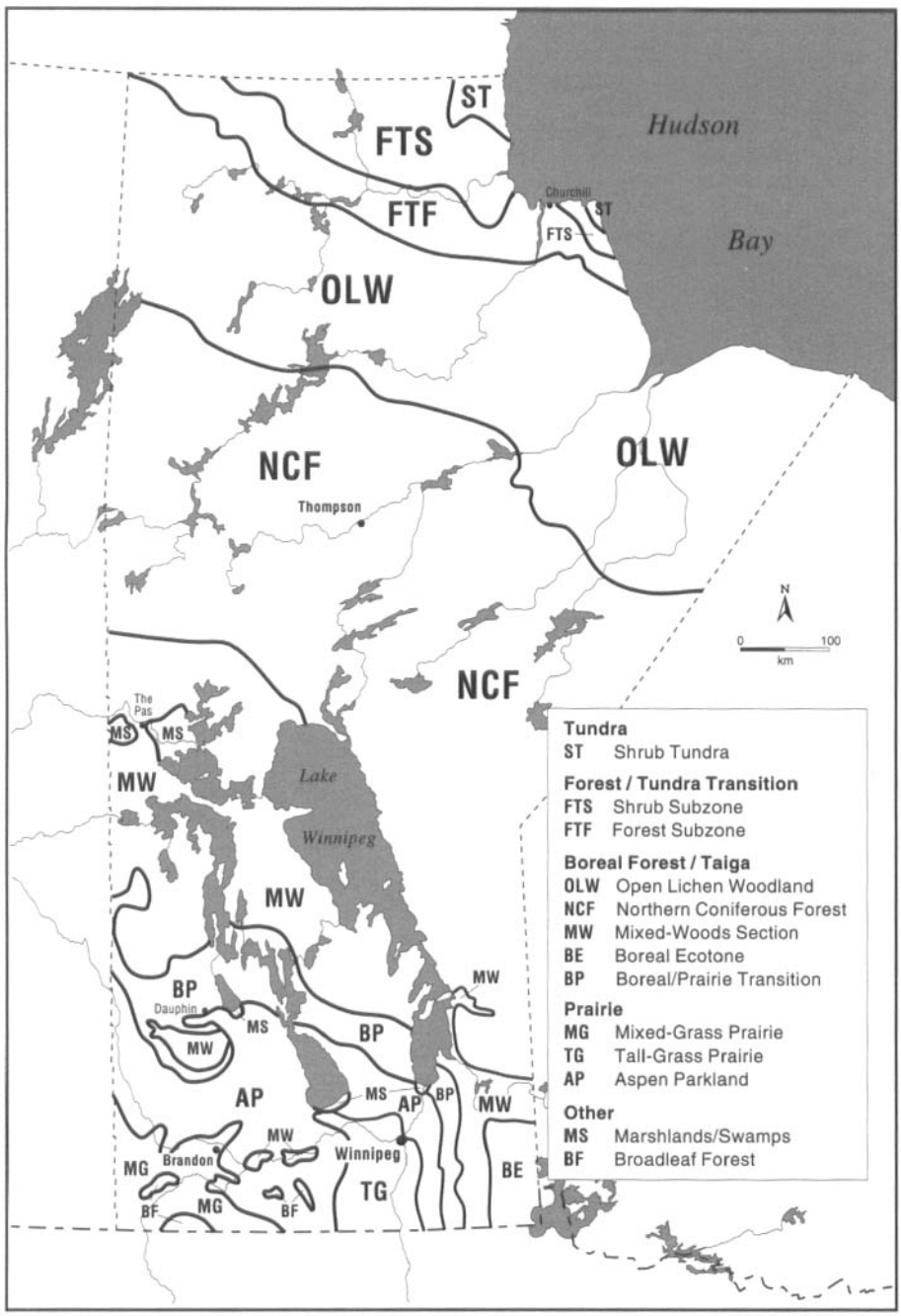

Figure 4.2 Potential Natural Vegetation Zonation in Manitoba (Sources: For tundra and forest tundra, K.P. Timoney et al., "The High SubArctic Forest-Tundra of North Western Canada: Position, Width, and Vegetation Gradients in Relation to Climate," Arctic *45[1992]:1–9; for boreal forest and mixed-woods, J.S. Rowe,* Forest Regions of Canada *[Ottawa: Department of the Environment, Canadian Forestry Publication 1300, 1972]; for boreal-prairie transition, S.C. Zoltai,* The Southern Limit of Trees on the Canadian Prairies *[Edmonton: Northern Forest Research Centre, Information Report NOR-X-128, 1975]; and for parkland and prairie, G.C. Trottier,* Conservation of Canadian Prairie Grasslands: a Landowner's Guide *[Ottawa: Environment Canada, 1992])*

Table 4.1 Land Surface of Manitoba Covered by the Major Soil Orders/ Great Groups

Soil Type	% of Land Surface
Black Chernozem	9.6
Dark Gray Chernozem	4.8
Gleysol	6.9
Regosol	1.4
Gray Luvisol	5.6
Organic Soils	17.5
Eutric Brunisol	13.2
Dystric Brunisol	8.5
Organic Cryosol	17.9
Turbic Cryosol	6.8
Rock	7.8
Total	100.0

Source: University of Manitoba, Faculty of Agriculture, *Principles and Practices of Commercial Farming in Manitoba*, 5th ed. (Winnipeg: University of Manitoba, Faculty of Agriculture, 1977), 33.

croachment by aspen, and occupies only a small portion in the southwest and many small remnant areas within the aspen parkland. Often termed the "mesic mixed-grass prairie" to differentiate it from the more xeric mixed-grass of southwestern Saskatchewan, this cover type is dominated by needle-and-thread (or spear) grass, northern wheat grass, June grass, and little bluestem, together with broadleaf herbs and sedges in moister locations (Figure 4.6).

On drier sites, shorter grass species, such as blue grama, join needle-and-thread, while sand grass and the creeping juniper shrub, with its outward-creeping ground-level branches, are found on well-drained sandy soils. Woody stands with shrubs and often trees are found in protected depressions such as the Pembina Valley, around potholes or small lakes, along rivers, and on sandy deltaic deposits (Case Study 4.1 on page 56). In addition, some grassland patches, such as those scattered throughout Riding Mountain National Park, are dominated by fescue and Kentucky bluegrass.

Black Chernozems are the dominant soil order throughout the region, whereas Regosols (poorly developed soils) are found in the Spruce Woods and along floodplains, and some patches of Solonetzic soils (which provide low-quality agricultural land) are found where sodium-rich parent material is present. Where soil textures are loamy and drainage adequate, Black Chernozems have good Canada Land Inventory (CLI) ratings for agriculture. While only 9.6 percent of Manitoba's soils are Black Chernozems and another 4.8 percent are Dark Gray Chernozems, these two Great Groups provide the overwhelming majority of all agricultural soils throughout the province (Table 4.1).

Long, sinuous riverine gallery forests are also found within this mixed-grass prairie and in the tall-

grass prairie and aspen parkland. These narrow strips of broadleaf deciduous forest (hardwoods) avoid typical prairie moisture deficits because of spring flooding and high water tables, and have survived prairie fires as they grow below the prairie level on the slopes and terraces of the incised river channels. Such forests are dominated by cottonwood, Manitoba maple, green ash, and willows. Elms are also found here, but as elsewhere in Manitoba, many are dying from Dutch elm disease, which reached Winnipeg from North Dakota in 1975. Shrub understoreys of saskatoon, dogwood, and fern are common, while bur oak, with its deeply penetrating tap roots, often dominates the upper-slope transition to prairie.

Aspen Parkland

Gone today are the spectacular conflagrations that destroyed thousands of square kilometres of prairie in a single fire and favoured the spread of grassland at the expense of forest. The demise of large-scale fires began in the latter part of the 19th century, and resulted from a combination of factors, including sod turning, highway development, and burning regulation. Today much of Manitoba's remaining mixed-grass prairie has been invaded by aspen and occasionally bur oak.[7] Aspen are ideally suited to this task, as they readily spread by root suckering to form clones or groves, and can resprout easily if exposed to the occasional fire. Their roots can radiate out 20 m or more from the parent tree! In the past such rapid fire-free invasion would have been slowed by the impact of grazing plains bison, a role filled today by the snowshoe hare and cattle.

Aptly named the aspen parkland, this cover type, which had already expanded somewhat south during the last 3,500 years because of climatic change, expanded rapidly into mixed-grass prairie during the last 100 years.[8] A comparison of the parkland/prairie boundary mapped by Seaton in 1905 and that mapped by Boivin in 1956 demonstrates clearly how dramatic this invasion has been (Figure 4.7).

Narrow strips of riverine gallery forest are also important landscape features throughout the parkland, with basswood joining the previously mentioned riverine hardwoods. Basswood forms almost pure stands on the lower terraces along the Assiniboine River, in the Assiniboine Woods of Charleswood, Winnipeg. Some areas of true broadleaf deciduous forest can also be found in areas such as Turtle Mountain and the Brandon Hills, but these are quite unlike broadleaf deciduous forests in eastern Canada, being dominated primarily by aspen and bur oak (Figure 4.2). Similar forests are found in Manitoba's boreal/prairie transition, but these forests include some conifers.

Aspen parkland soils still reflect properties imparted to them when they were grass-dominated, although towards the wetter margins, increased leaching due to a more acid-promoting tree litter has encouraged the development of Dark Gray Chernozems. Marshes are also characteristic of mixed-prairie and aspen parkland where pot-

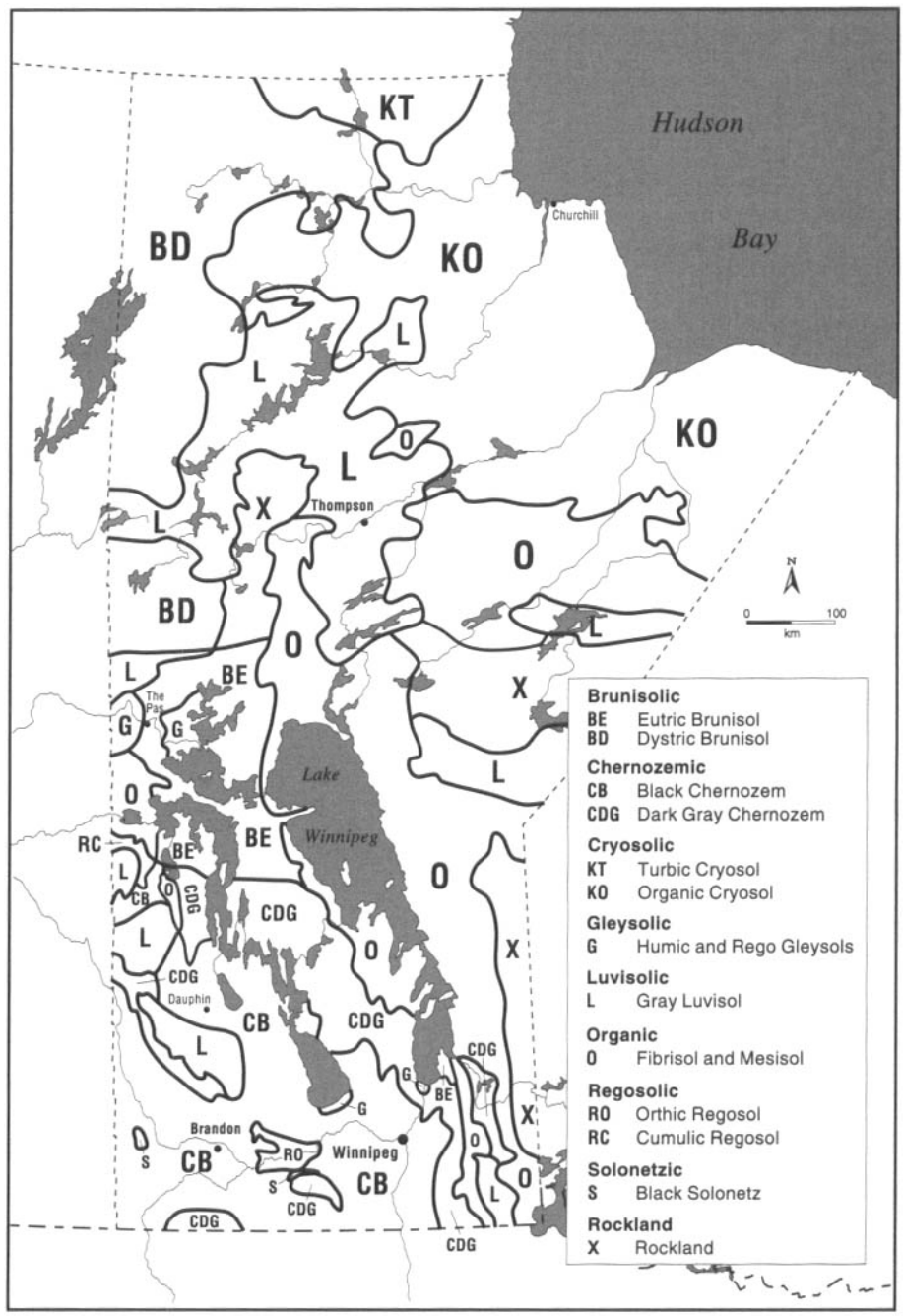

Figure 4.3 Dominant Soil Landscapes in Manitoba (Source: Agriculture Canada, Soil Landscapes of Canada: Manitoba *[Ottawa: Agriculture Canada, Land Resource Research Centre, Publication 5242/B, 1989])*

holes, lake deltas, and lagoons are common (Figure 4.8).

These wetland types are generally mineral-rich (eutrophic or mesotrophic),[9] and, as in the case of lakeshore (often deltaic) areas, may be periodically inundated by standing or slowly moving eutrophic water. Reeds, cattails, and bulrushes dominate such lake margins in the Minnedosa pothole country, the Delta Marsh at the southern end of Lake Manitoba, and the Netley Marsh at the southern end of Lake Winnipeg. Grasses (such as fowl-meadow grass, reed grass, and white-top grass) and sedges compete better on somewhat less saturated soils, while aspen and willows often form wetland fringes. Delta marshes experience frequent flooding and periodic water level fluctuations controlled by lake levels, and are therefore more difficult to convert for agriculture. However, many of the smaller snowmelt-dependent potholes of the Minnedosa area are often only seasonal wetlands, with most having been effectively drained and converted (Figure 4.9). As they are highly productive ecosystems in terms of mammal and waterfowl food supply and cover, their loss has had a major impact on wildlife.

Tall-Grass Prairie

Before the Red River Lowlands landscape south of Winnipeg was transformed by agricultural expansion, it was dominated by tall-grass prairie, or "true prairie," as many of the early settlers called it. This topographically low central basin of the former glacial Lake Agassiz supported lush grasslands, wetlands, and long, narrow riverine gallery forest, and it represented an extension of the tall-grass prairie stretching north from the Dakotas. Seasonal flooding, poor drainage, and fire combined to promote a 2-m big-bluestem- and switch-grass-dominated herbaceous cover; however, it also produced many marshlands and discouraged tree growth except along incised river channels (Figure 4.10), and allowed organic and nutrient-rich Black Chernozems and Humic Gleysols to develop.

Today most of the marshlands have been drained, thereby allowing even the Humic Gleysols to be used

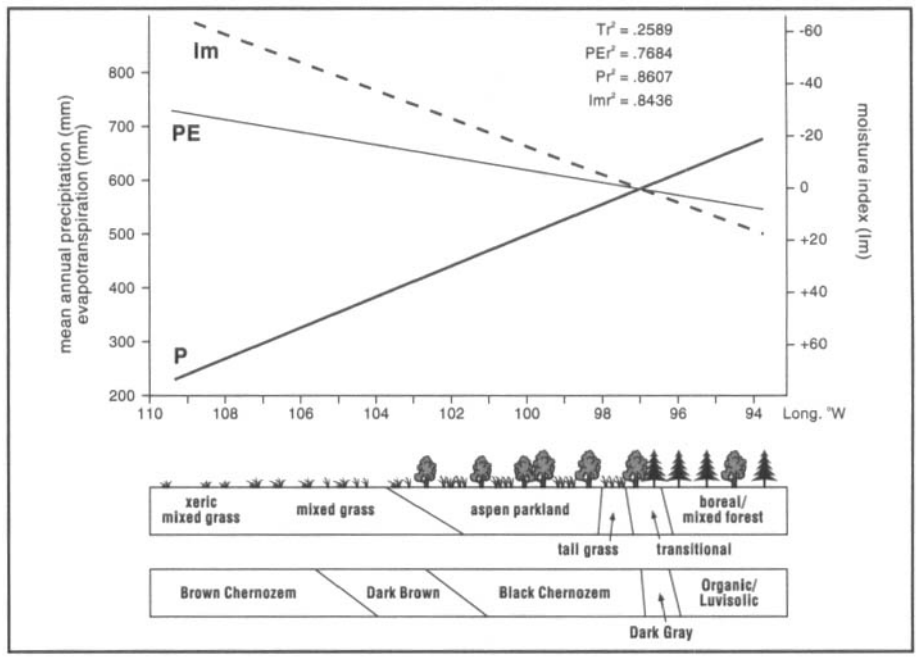

Figure 4.4 Transect from Mixed-grass Prairie to Boreal Forest. Based on data from all long-term climatic stations located between 49°N and 50°N latitude from central Saskatchewan to eastern Manitoba. T = mean annual temperature (°C), PE = potential evapotranspiration (mm), P= mean annual precipitation (mm), Im = moisture index (where the Im is based on the formula [P/PE - 1] 100); no regression line is provided for temperature because, as might be expected, the r^2 indicates little correlation between longitude and temperature across this central-continental plain region; the moisture index (Im) produces negative values when mean annual precipitation is less than potential evapotranspiration (PE) and is positive when precipitation exceeds PE. (Source: Modified from G.A.J. Scott, Canada's Vegetation: A World Perspective *[Montreal: McGill-Queen's University Press], 1995)*

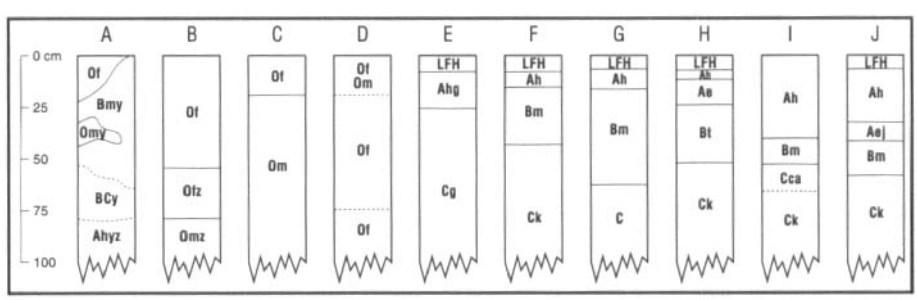

Figure 4.5 Soil Profiles for Some of Manitoba's Great Groups. A = Turbic Cryosol, B = Organic Cryosol, C = Mesisol, D = Fibrisol, E = Humic Gleysol, F = Eutric Brunisol, G = Dystric Brunisol, H = Gray Luvisol, I = Black Chernozem, J = Dark Gray Chernozem; for organic profiles, Of refers to fibric (fibrous) and Om to moderately decomposed organic layers. For mineral soil profiles, A, B, and C refer to the major horizons, while LFH refers to surface litter; ca = secondary carbonate enrichment, e = eluviated, g = gleyed, h = humus, j = weakly expressed horizon, k = carbonate present, m = modest chemical and colour change due to weathering, t = clay enrichment, y = cryoturbated (frost heaved), z = permanently frozen layer. (Source: Canadian Soil Survey Committee, The Canadian System of Soil Classification *[Ottawa: Canada Department of Agriculture, 1978])*

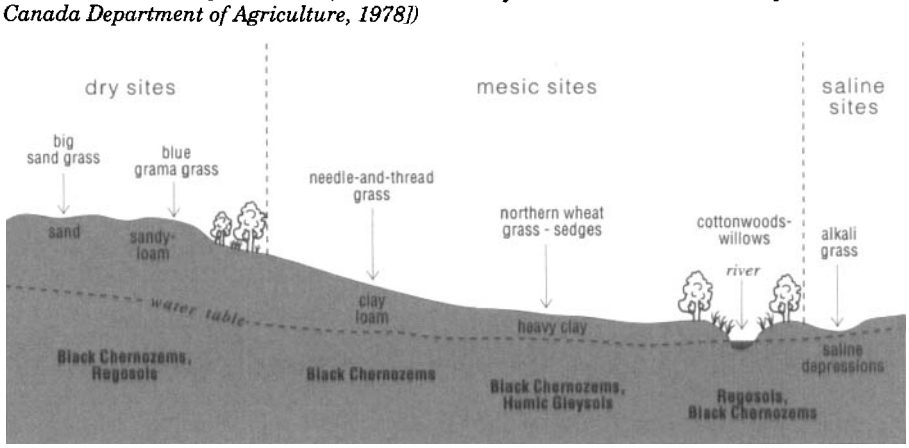

Figure 4.6 Community Diversity Typical of Mixed-grass Prairie

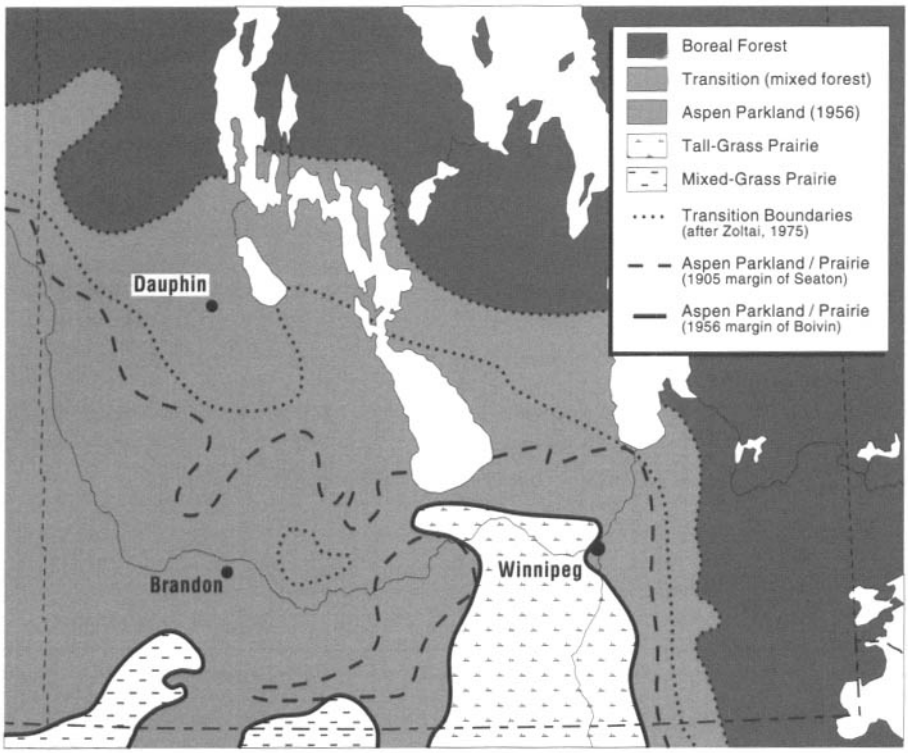

Figure 4.7 Expansion of Aspen Parkland in Manitoba between 1905 and 1956 (Source: Modified from G.A.J. Scott, 1995, which is based on maps by E.T. Seaton [1905] and B. Brown [1956] as represented in R.D. Bird, Ecology of the Aspen Parkland of Western Canada in Relation to Land Use *[Ottawa: Department of Agriculture, Research Branch Publication 1066, 1961])*

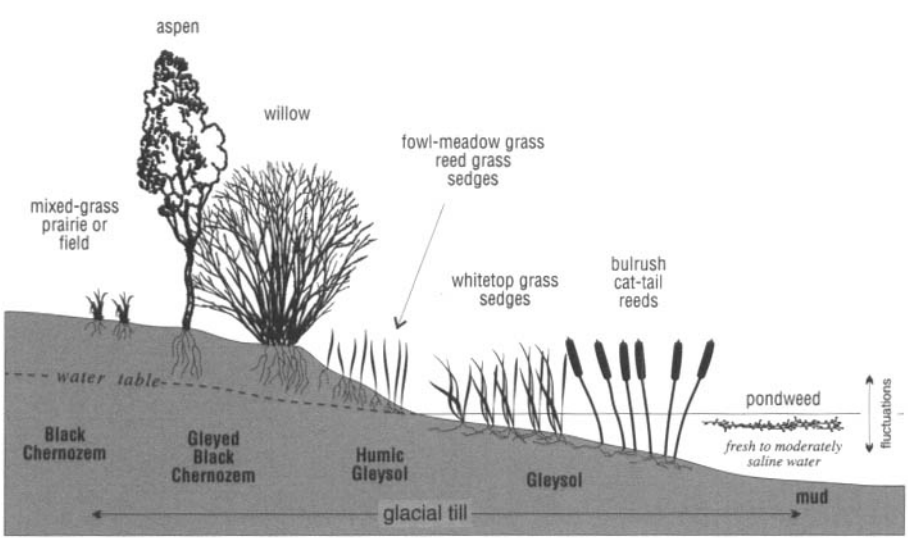

Figure 4.8 Community Diversity Typical of a Pothole Lake Margin (Source: Modified from Scott, 1995)

for agriculture. Likewise, because of the fertile Black Chernozems that these herbaceous species were so instrumental in promoting, and because of the reduction in burning, only some 400 hectares (ha) of undisturbed true tall-grass prairie, such as the Living Prairie Museum in St. James, remain today. Fortunately, somewhat larger patches of big bluestem prairie can be found within the aspen parkland, such as near Tolstoi. Formerly prairie, the aspen-dominated Assiniboine Forest in Winnipeg owes its current woody cover to protection from both burning and the plough.

The inherently fertile lowland prairie soils actually present many agricultural challenges. High water tables promote localized soil salinity; the precipitation regime is uncertain; drought encourages insect pests such as grasshoppers; and the earlier traditions of excessive tillage, stubble burning, and summer fallowing (to enhance available nitrogen) have led to a 40–50 percent reduction in topsoil organic matter since conversion. This dramatic loss has reduced the size of topsoil aggregates, making them more susceptible to wind erosion when dry southerly winds cross bare soil in spring. Today, with reduced summer fallowing and stubble burning, more concern for conservation practices such as reduced tillage (and occasionally zero tillage), and better trash management, many of these negative impacts are being reduced.

The great majority of undisturbed prairie and parkland wetlands are ideal breeding grounds for a variety of summer-resident waterfowl that thrive on duckweed or other aquatic plants, and they serve as important staging areas for migratory waterfowl such as the Canada goose. In addition, native cover provides suitable habitats for such mammals as muskrat, mink, raccoon, red fox, and the introduced white-tailed deer. Aspen parkland wetlands are also important habitats for amphibians, and summer feeding grounds for several species of garter snake that feed on these amphibians. These snakes, however, must overwinter in underground hibernacula, as in the aptly named "snake pits" or limestone caverns in the uplands around Narcisse (Case Study 2.1 on page 23).

Wetland drainage has had serious impact on wildlife, particularly in the pothole regions and in the Red River Lowlands. Fortunately, remaining natural marshes, such as Netley Marsh, are subject to cycles of flooding and natural drawdown (drying out), which not only help regenerate the ecosystem and ensure wildlife food supply but also limit their suitability for artificial drainage to produce agricultural land. The Red River lowland marshes, being located away from any large lake, did not possess the same natural protection from artificial drainage, and so have been reduced to a

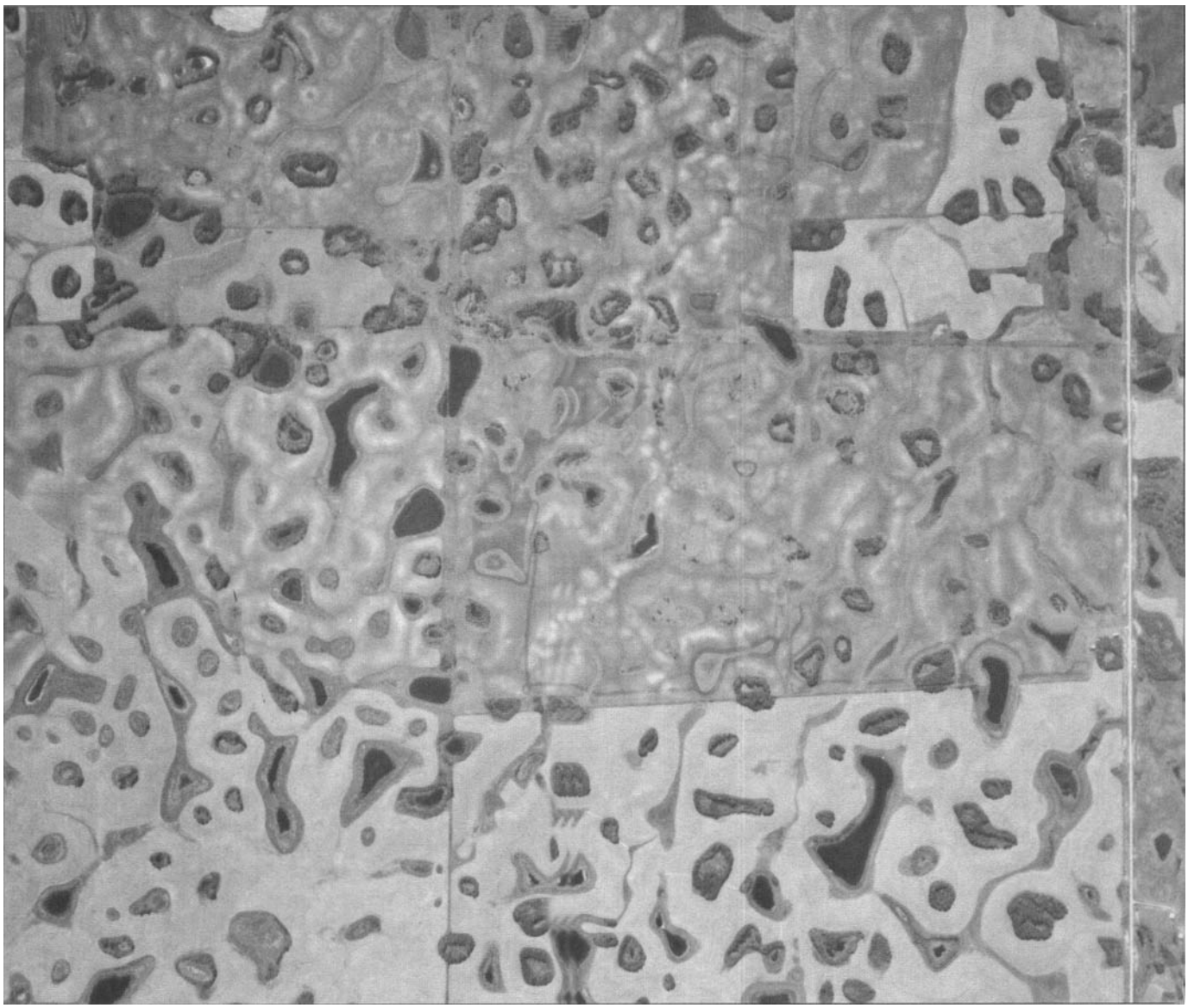

Figure 4.9 Ground-moraine Topography on the Minnedosa-Reston Till Plain. The photograph was taken in 1964; many of the sloughs (potholes) will have been drained by now. North is at the top of the photograph. (Photograph: NAPL A18611-23)

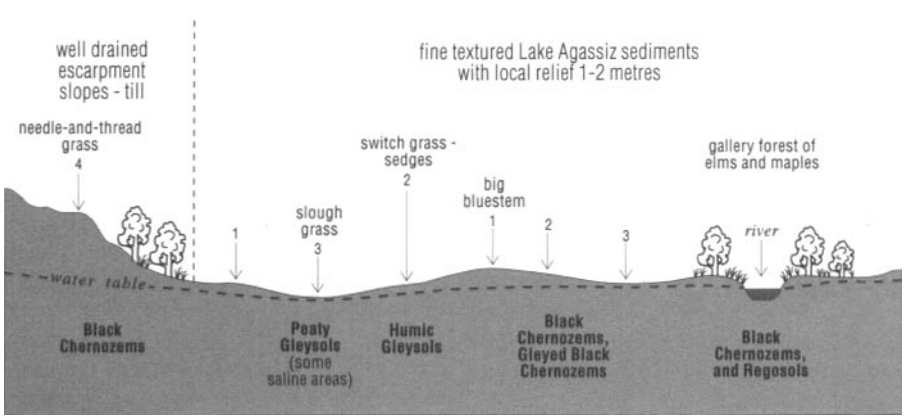

Figure 4.10 Community Diversity Typical of Undisturbed Tall-grass Prairie in the Red River Lowlands of Manitoba (Source: Modified from Scott, 1995)

fraction of their former grandeur. Today all that remains of the huge St. Andrews Bog, which was located just north of Winnipeg, is the artesian-fed 3,600 ha Oak Hammock Marsh, which has been maintained as an important wetland and staging area for migratory waterfowl by regulating water levels and practising periodic drawdown.

Non-waterfowl bird species such as the blue jay and sharp-tailed grouse are also common throughout the Prairies, as they have adapted well to remnant aspen stands, shelterbelts, and a generally managed parkland landscape. The American kestrel is especially noticeable in summer on fence posts or

hovering over fields or rights-of-way, spying on the small mammals and insects below.[10]

BOREAL ECOCLIMATIC PROVINCE

All three subprovinces of the Boreal Ecoclimatic Province, the Low, Mid-, and High Boreal, are represented in Manitoba. These include all forested regions between the aspen parkland to the southwest and the open lichen woodland to the north and northeast (Figure 4.2). While open lichen woodland is still considered part of the boreal or taiga, its openness has meant that ecoclimatically it is classified as part of the Low Subarctic. As Manitoba's continentality produces colder and longer winters and somewhat less humid conditions than in the boreal regions of Ontario and Quebec (Chapter 3), it is not surprising that Manitoba's coniferous forest differs somewhat from that further east. Ecoclimatic regions represented here include parts of the Subhumid Low Boreal and Subhumid Transitional Low Boreal to the south and southeast, and the Subhumid Mid-Boreal and Subhumid High Boreal to the north (Figure 4.1).

Subhumid Low Boreal and Subhumid Transitional Low Boreal Ecoclimatic Regions

Along the southern fringes of the Subhumid Low Boreal is the boreal/prairie transition, a narrow zone of both broadleaf deciduous hardwoods and conifers (softwoods). The southern boundary of this transition is where at least one but not more than three of the four typical boreal conifers (jack pine, white spruce, black spruce, and tamarack) are encountered along with the ubiquitous aspen,[11] while the northern boundary is where all four conifers can be found.

To the north and east of this narrow transitional zone is the classic northern coniferous forest, where all four of these important conifers thrive, together with others such as balsam fir and some hardwoods. Occasionally eutrophic swamp areas are also encountered, usually dominated by eastern white cedar. Because of the somewhat drier nature of the continental climate in the three Prairie provinces, aspen, balsam poplar, birch, and occasionally bur oak remain important components, so that this southern boreal is often called the "northern mixed woods" or simply the "mixed-woods section."[12]

Within the mixed-woods section, mineral soil profiles are subject to greater leaching and have lower organic matter content than their prairie counterparts; they are typically Gray Luvisols and Eutric Brunisols. Where mineral soil drainage is poor, Humic Gleysols dominate. Both here and in the northern boreal forest are also found fen wetlands (eutrophic or mesotrophic due to base-rich ground water) and bogs (acid or oligotrophic ground water), with their organic Fibrisols and Mesisols.[13] Generally, only in the southern margins do soils have any real potential for agriculture, while the drained wetlands of the Pasquia River southwest of The Pas mark the northern limit of effective mixed farming.

Besides all the typical boreal tree species mentioned above, the milder Subhumid Transitional Low Boreal Ecoclimatic Region of southeastern Manitoba permits two important conifers, white and red pine, to join typical boreal communities (the boreal ecotone in Figure 4.2). Their presence in the southeastern corner of the province indicates that forest cover here is becoming more characteristic of the boreal-broadleaf ecotone, which separates boreal forest in general from the oak-beech-maple dominated temperate deciduous forests to the southeast of Manitoba.

Located almost entirely on the Canadian Shield, this region also has a greater preponderance of poorly drained lowland bogs with their black spruce–sphagnum communities, and of granitic rock outcrops with their thin, often only 10–15 cm thick, organic soils (Folisols) dominated by jack pine to the north and white, red, and jack pine to the southeast. Some of the acid sphagnum peat in the Agassiz Forest bogs near Beausejour and Hadashville is harvested for horticultural purposes. Better-drained mineral soils are dominated by aspen, poplar, spruce, and, sometimes in later successional stands, balsam fir.

Despite considerable logging and forest fire activity, less of the natural vegetation has been disturbed here in the mixed-woods section and boreal ecotone than in the prairies, so the region supports a rich fauna. Typically throughout the southern boreal, on recent burn or logged-over (clearcut) sites on well-drained soils and rock outcrops, the early succession includes woody shrubs such as low sweet blueberries and common bearberries, which provide fruit and browse for many animal species, as well as postfire herbs such as fireweed.

Typical of the southern boreal are black bear, coyote, fisher, lynx, red fox, weasel, timber wolf (a gray wolf subspecies), and even some white-tailed deer; while moose, beaver, mink, and muskrat populations are more common along rivers and in marshes or moister lowlands. Many species are hunted and trapped for food and fur by Aboriginal people, and their preservation locally is often assured by co-management projects where both conservation and Aboriginal use is the focus. After a successful moose comanagement project in the Lake Waterhen region on the east side of Lake Winnipegosis, a wood bison restoration project was established in 1984.[14]

Subhumid Mid- and High Boreal

Here typical northern coniferous forest conifers dominate uplands and are joined in better-drained lowlands by birch and aspen to produce a mosaic of ecosystem types, usually with a ground cover of feather mosses on better-drained sites and sphagnum/Labrador tea–moss/low shrub cover on poorly drained acid lowlands. Large areas are dominated by closed-canopy white spruce (Figure 4.11, site 1) and black spruce forest (sites 2 and 3). On rock outcrops or sandy/gravelly esker ridges, open jack pine dominate because of physiological drought conditions.

In eutrophic and mesotrophic fen wetlands, tamarack with some black spruce form open forest over a sedge, willow, alder, and non-sphagnum moss ground cover. Where wetlands are oligotrophic, such as in domed bogs, sphagnum mosses dominate,

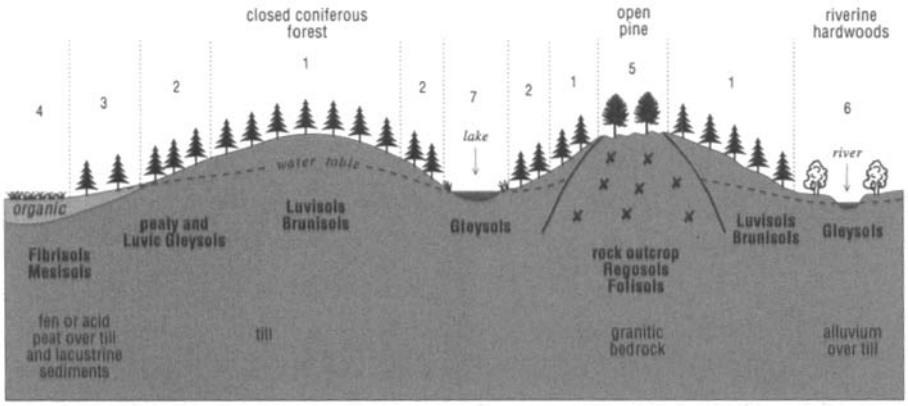

Figure 4.11 Generalized Transect through Northern Coniferous Forest (Source: Modified from Scott, 1995)

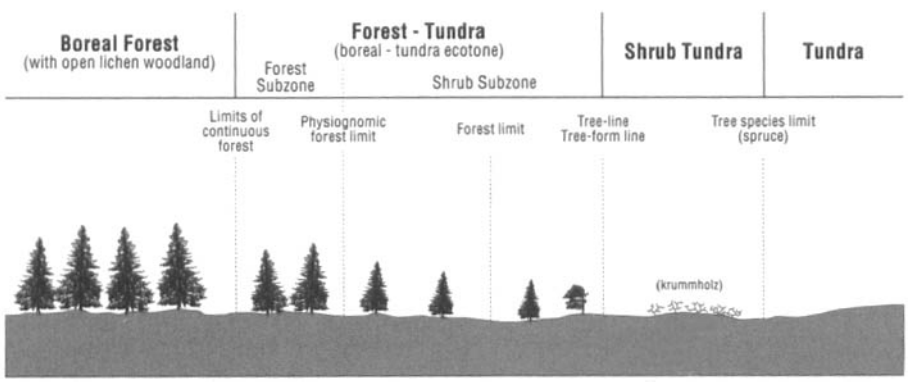

Figure 4.12 A Typical Transect across the Forest-tundra from Boreal Forest in the Southwest to Tundra in the Northeast (Source: Modified from Scott, 1995)

along with bog laurel, Labrador tea, and scattered black spruce. From the air, floating wetland vegetation can be seen growing out from many sheltered Shield lake margins, reducing lake size, smoothing their outlines, and, in the case of small lakes, even completely covering them and perhaps filling them in.

These great expanses of softwood-dominated northern coniferous forest have been the logging grounds of large pulp operations centred around The Pas and Pine Falls, with spruce, fir, and some jack pine important in both pulp and some construction-lumber production. There is also potential for oriented strand board (waferboard) production from mixed-woods section aspen, and improved hardwood pulping techniques have now opened the way for future aspen pulp production.

Because of the cooler subhumid climate and resulting lower soil organism activity than in the mixedwoods section, soil profile alteration generally gives rise to Eutric Brunisols on well-drained calcareous mineral parent material, and to Dystric Brunisols where parent material is strongly acidic. Fibrisols, Mesisols, and Gray Luvisols are also encountered, and localized permafrost encourages Cryosol development (Figures 4.3 and 4.5). Unlike other soil orders, which are classified as being either mineral or organic, Cryosolic soils simply have to have permafrost within 1– 2 m of the surface; as permafrost is independent of whether the soil is mineral or organic, both mineral and organic Great Groups are present within this order. The Organic Cryosols (peat with permafrost) and the Turbic Cryosols (cryoturbated or frost-heaved mineral soil) are both abundant throughout Manitoba's north, while Static Cryosols (noncryoturbated mineral soil) are less common.

Like the prairies to the southwest, the boreal has had a long history of burning and postfire succession. So frequent are forest fires that not only do many species possess some adaptations to fire but they actually take advantage of it. The early successional species, jack pine, has serotinous cones that respond to the heat of fire by releasing seeds. This gives jack pine the advantage that, after fire in an area where some jack pine were part of the burned cover, its seedlings dominate postfire succession.

Because so many of the boreal forest nutrients are tied up in both living plant tissue and litter, periodic fires may also aid in nutrient cycling. As natural postfire succession back to white spruce climax forest can take several hundred years, many areas have little opportunity or time to complete this succession before fire once again intervenes. North of Grand Rapids, many areas of limestone/dolostone pavement (Case Study 2.1 on page 23) with their thin mineral or organic (Folisol) soils are usually dominated by jack pine fire-subclimax forest, because here fire usually intervenes before spruce — which finds successional conditions slow on these thin soils — has sufficient time to take over.

Forest fires also play an important role in promoting different successional stages, permitting different communities of wildlife to coexist. In the northern boreal as in the forest-tundra beyond, caribou are particularly important to Aboriginal people. So important has their conservation and management become that today comanagement projects such as the Beverley and Kaminuriak Barrenground Caribou Agreement (between the Inuit, Dene, Cree, Métis, and provincial/territorial governments) help manage this important resource for 10,000 people in northern Manitoba, northern Saskatchewan, and southeastern Northwest Territories.

SUBARCTIC ECOCLIMATIC PROVINCE

Low Subarctic Ecoclimatic Subprovince

The Low Subarctic consists of those northern portions of the boreal forest known as "open lichen woodland" or "open spruce forest," and its northern margin marks the limits of continuous forest (Figure 4.12). The name "open lichen woodland" is suitable because the better-

drained upland ground cover is dominated by light-coloured fruticose lichens, which are easily seen from the air between the scattered spruce (Figure 4.13). Often associated with the upland lichens are sphagnum mosses, dwarf birch, and Labrador tea. Responding to the effects of shading, feather mosses instead of lichen dominate under white spruce, whereas sphagnum bog dominates acid ground water sites in depressions or lower topographic positions, and open tamarack fen is found where ground water is mesotrophic or eutrophic.

The presence of permafrost is more noticeable here than in the High Boreal, so that Organic and Turbic Cryosols dominate large areas (Figure 4.3). Caribou play a significant role in modifying lichen cover as they migrate from forested regions followed by the caribou wolf, either to these summer lichen grazing grounds or to grazing grounds in the High Subarctic or Low Arctic. The caribou wolf is more plentiful than the other local gray wolf subspecies, the timber wolf. It is the dominant wolf north of 58°N.

Figure 4.13 Open Lichen Woodland (light-toned patches) and Fen on the Hudson Bay Lowlands, North of Gillam. Note the circular spruce stands in the foreground; these appear to dominate the ridges left by paleo-polygons. (Photograph: G. Scott)

*Figure 4.14 Boundary between Open Lichen Woodland and the Forest-tundra near Twin Lakes, 35 km Southwest of Churchill. Here on the calcareous uplands the dominant conifer is white spruce (*Picea glauca*) together with a ground cover of light-coloured lichen; on the plain below, the sparse tree cover consists of white spruce and tamarack* (Larix laricina). *(Photograph: G. Scott)*

Figure 4.15 Flag Forms of Spruce near Twin Lakes, in the Churchill Region. Trees in the foreground are spruce, while to the right rear they are tamarack. (Photograph: G. Scott)

High Subarctic

Climatic conditions vary rapidly across the High Subarctic because this is the location of the average summer position of the polar front (Chapter 3). So sharp is the resulting temperature gradient that forest-promoting climatic conditions are found to the south of this zone while conditions discouraging the development of the true tree life form (less than 5 m tall at maturity) are found to the north (Figure 4.14). In terms of vegetation cover, this landscape appears almost tundra-like, yet there are scattered patches of open spruce forest. Best described as forest-tundra, cover varies from a situation where open spruce forest almost covers the complete landscape, to the tree line (or tree-form line), where tree species can no longer develop the true tree life form.

In the southern forest-tundra (forest subzone) (Figure 4.2), white and black spruce and tamarack are the dominant tree species, while birch and even aspen can occasion-

ally be found along rivers. Lichens, mosses, and woody shrubs dominate both the treeless expanses and the spaces within open forest clumps. In the northern forest-tundra (shrub subzone) a shrub tundralike community dominates, together with small open clumps of white or black spruce in more sheltered sites. Krummholz (German for "crooked wood") and flag forms (where branches survive primarily on the downwind side of the trunk) of white spruce are found in somewhat more exposed sites, such as around Churchill (Figure 4.15). Many of these stunted spruce also possess another adaptation, layering, where lower branches hug the ground, surviving from year to year protected from the desiccating, ice-crystal blasting winds of winter below a blanket of snow.[15]

As some of the herbaceous species found within this shrub subzone are absent in the tundra just to the north, this northern boundary is not simply a tree line but also a phytogeographic barrier for several nontree species. In the more tundralike portions of the forest-tundra, and in the tundra to the north, permafrost, cryoturbation, ice lens growth, and surface drainage patterns give rise to a mosaic of ecosystem types, including peat polygons, palsas, hydrolaccoliths, and thermokarst lakes.

Peat polygons are a distinctive feature of organic and fine-sediment soils, where ground ice contracts during the extremely cold winter to form deep cracks. These cracks fill with spring melt to later form ice wedges that can grow several metres thick as the process is repeated annually. A distinctive polygonal shape results from the microtopographic variations produced by this wedging, and the pattern is accentuated by the resulting vegetation mosaic (Figure 4.16). Palsas are ice-filled peat mounds, often 15 m across, which usually rise more than a metre above the surrounding tundra before they crack open, begin to thaw, and slowly collapse. Good examples of palsas can be seen near Churchill (Figure 4.17).

Occasionally artesian water attempting to reach the surface forms

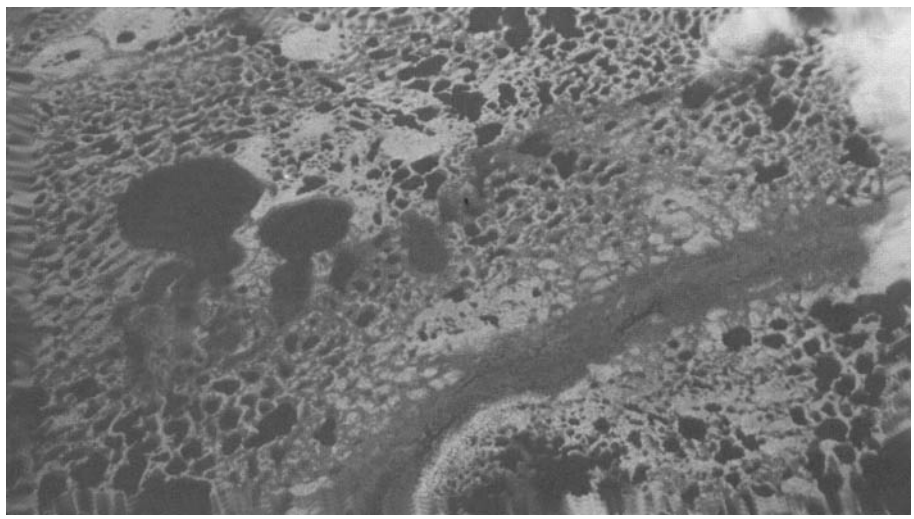

Figure 4.16. Typical Thermokarst Landscape on the Hudson Bay Lowlands North of Gillam. Classic peat polygons can be seen to the right of the drainage system at the bottom of the photograph. (Photograph: G. Scott)

Figure 4.17 Lichen-dominated Palsa in a Fen Palsa Field near the Churchill Northern Studies Centre. These mounds consist of ice-filled peat, between which permafrost is only encountered at depth. Scattered white spruce on the horizon show that this is part of the forest-tundra region. (Photograph: G. Scott)

palsalike features known as hydrolaccoliths. Similar to palsas in scale, they are quite unlike them internally, as they are filled with a pure ice lens or blister exceeding a metre in thickness (Figure 4.18). These too undergo rapid demise when the peat overburden stretches to the point that it cracks open, and the pure ice is exposed to warm air, causing the hydrolaccolith to collapse rapidly.

Examples of these features can be seen east of the Twin Lakes area, in the Churchill region. Thermokarst lakes are more frequently encountered in the forest-tundra, where unequal surface heating has given rise to large-scale surface permafrost melting. Unequal growth of permafrost in moss mounds can also give rise to the frost disturbance best described as "drunken forest." Here roots of one side of the spruce tree are forced upward because the moss-covered organic soil through which they penetrate begins to form a mound due to ice growth. If these are major roots, the tree is forced to lean away from the mound. This often results in trees leaning in different directions at different angles.

As noted above, postglacial climatic fluctuations in Manitoba have had major impacts on boundaries between vegetation types. This is particularly true of northern

Figure 4.18 Two Individuals Standing on a Hydrolaccolith. The two individuals in the background are standing on a hydrolaccolith, a solid ice-filled mound under a thin layer of peat. The hydrolaccolith in the immediate foreground has stretched its thin peat cover to the point that it split along narrow cracks. This splitting has allowed the ice to melt rapidly, causing the mound to collapse. The clean ice face shown here is more than one metre thick. Near Twin Lakes, Churchill region. (Photograph: G. Scott)

Manitoba, where even minor fluctuations in the average position of the polar front have major implications for tree growth. It should be noted that a major southward shift in the tree line occurred approximately 3500 B.P., but since then it has fluctuated both north and south of its present position by as much as 100 km.[16]

ARCTIC ECOCLIMATIC PROVINCE

Low Arctic

Only two large areas of true treeless tundra are found in Manitoba: where the Low Arctic Ecoclimatic Region dips south of the northern provincial boundary west of Hudson Bay, and where winds off the pack ice extend tundra into the High Subarctic south of Cape Churchill (Figure 4.2). While the name "tundra" is derived from the Finnish *tunturi,* meaning "completely treeless heights," the vegetation cover here is best described as shrub tundra because low shrubs such as willows, alpine bearberry, alpine blueberry, dwarf birch, crowberry, rock cranberry, Arctic avens, soapberry, Lapland bog-rosebay, and dwarf Labrador tea thrive. Any white or black spruce that do survive here take on mat-krummholz or low flag forms, never true tree life forms. Important nonwoody species include cushion forms such as purple saxifrage, cotton grass, lichens such as the reindeer moss, and numerous mosses. Despite lacking any true tree cover, tundra ecosystems exhibit remarkable variation in species composition because of moisture and topographic differences brought about by the permafrost-related activities discussed in the previous section.

It is important to note that although the biomass and net annual productivity of plant communities throughout the Low Arctic appear quite diminutive, such communities do serve as relatively rich feeding grounds and attract large summer populations of migratory species. The variety of habitat types, the abundance of lichen, the somewhat higher protein content of arctic vascular plants, and the variations in timing of community growth bursts combine to favour a reasonably continuous supply of summer browse for caribou, as wetlands do for waterfowl. In addition, the abundant marine food supply supports a winter pack-ice seal population that in turn serves as the staple for polar bears. This polar bear pack-ice food supply is complemented by suitable denning grounds, especially along the Hudson Bay shoreline just south of Cape Churchill, where the bears often dig caves down to permafrost under peat hummocks.

CONCLUSION

Manitoba is fortunate in having such latitudinal extent and differences in climate that all but the 4 Cordilleran and 2 Temperate Ecoclimatic Provinces of Canada are represented here. Likewise, all 10 of the soil orders of the Canadian Soil Classification are represented. Such variety provides habitats for an important array of faunal species, from the snakes of the subhumid southwest to the polar bears of the northeast. In the southwest are the subhumid, warm-summer prairies, riverine gallery forests, and parklands with their Chernozems, Regosols, and Gleysols. Broadleaf deciduous and mixed deciduous-coniferous forests with their Luvisols and Brunisols dominate to the north and east of the prairies, while the coniferous forests with their Brunisols and Cryosols dominate the boreal zone of central and northern Manitoba. Only in the northeastern corner of the province does the open lichen woodland of the northern boreal give way to the Cryosols and permafrost-dominated tundra landscape, while scattered throughout all these landscapes are the wetlands, with their Gleysols, Fibrisols, Mesisols, and Organic Cryosols.

NOTES

1. Here the term "ecosystem" is designed to convey the division of ecoclimatic regions into major vegetation types with their associated fauna and soils. For example, the Transitional Grassland Ecoclimatic Region can be readily subdivided into the mixed-grass prairie, aspen parkland, and tall-grass prairie ecosystems.
2. Ecoregions Working Group, *Ecoclimatic Regions of Canada, First Approximation* (Ottawa: Environment Canada, Ecoregions Working Group of the Canadian Committee on Ecological Land Classification, Ecological Land Classification Service, Conservation and Protection, 1989), 1.
3. Ecoclimatic provinces can be subdivided into ecoclimatic subprovinces, which in turn can be subdivided into ecoclimatic regions. For example, the Boreal Ecoclimatic Province includes the High, Mid-, and Low Boreal Subprovinces, and the High Boreal Subprovince includes a number of ecoclimatic regions, including the

Subhumid High Boreal (HBs), found in north-central Manitoba.

4. National Wetlands Working Group, *Wetlands of Canada,* Ecological Land Classification Series 24 (Ottawa: Environment Canada, Sustainable Development Branch, Canadian Wildlife Service; and Montreal: Polyscience Publication, 1988).
5. For more detailed information on Manitoba's vegetation history based on detailed pollen (palynology) studies, see J.C. Ritchie, "The Late-Quaternary Vegetation History of the Western Interior of Canada," *Canadian Journal of Botany* 54(1976):1,793–818.
6. The Canadian System of Soil Classification is a hierarchical system in which soil orders are the highest level. All nine orders in the Canadian System are represented in Manitoba, although in Figure 4.3 the Podzolic Order is missing because of its scarcity and the mapping scale used. Soil orders are in turn subdivided into Great Groups; in the Chernozemic Order there are four Great Groups: the Brown, Dark Brown, Black, and Dark Gray.
7. D.V. Hildebrand and G.A.J. Scott, "Relationships Between Moisture Deficiency and Amount of Tree Cover on the Pre-Agricultural Canadian Prairies," *Prairie Forum* 12(1987):203–16.
8. Ritchie, "The Late-Quaternary Vegetation History."
9. *Eutrophic* means nutrient rich. In the case of wetlands this normally means there is a plentiful supply of calcium and magnesium in the water/ground water, and that it is alkaline. *Mesotrophic* conditions occur where bases are somewhat less plentiful but the water/ground water is only mildly acidic. *Oligotrophic* means low supply of base and therefore strongly acidic.
10. For a general overview of prairie ecosystems, see G.C. Trottier, *Conservation of Canadian Prairie Grasslands: A Landowner's Guide* (Ottawa: Environment Canada, Canadian Wildlife Service, 1992).
11. S.C. Zoltai, *The Southern Limit of Trees in the Canadian Prairies* Information Report NOR-X-128 (Edmonton: Northern Forest Research Centre, 1975).
12. J.S. Rowe, *Forest Regions of Canada,* Publication 1300 (Ottawa: Department of the Environment, Canadian Forestry Service, 1972).
13. Bogs are peatlands generally with the water table at or near the surface, and they are acidic and low in nutrients (oligotrophic). Fens are also peatlands but with nutrient-rich waters (mesotrophic or eutrophic), mainly derived from mineral soils weathering upslope. In a process known as paludification, wetland fen peat accumulates over time so that the vegetated surface may rise above incoming base-rich ground water and become dependent on oligotrophic rainwater. If this happens, fen gives way to acid bog. For more information on wetlands, see National Wetlands Working Group, *Wetlands of Canada.*
14. H. Nepinal and H. Payne, "Wildlife Co-Management," in *People and Land in Northern Manitoba,* University of Manitoba Anthropology Papers 32, ed. Y. Lithman, R. Riewe, R. Wiest, and R. Wrigley (Winnipeg: University of Manitoba, 1992), 233–43.
15. For an interesting account of adaptations to desiccating winds and ice-crystal abrasion in the Churchill region, see P.A. Scott et al., "Crown Forms and Shoot Elongation of White Spruce at the Treeline, Churchill, Manitoba, Canada," *Arctic and Alpine Research* 19(1987):175–86.
16. Ritchie, "The Late-Quaternary Vegetation History."

Appendix 4.1 Common and Binomial Names of Plants Mentioned in Chapter 4

alder	*Alnus* spp.
alpine bearberry	*Arctostaphylos alpina*
alpine blueberry	*Vaccinium uliginosum*
Arctic avens	*Dryas integrifolia*
aspen	*Populus tremuloides*
balsam fir	*Abies balsamea*
balsam poplar	*Populus balsamifera*
basswood	*Tilia americana*
big bluestem	*Andropogon gerardii*
birch	*Betula papyrifera*
black spruce	*Picea mariana*
blue grama	*Bouteloua gracilis*
bog laurel	*Kalmia polifolia*
bulrush	*Scirpus* spp.
bur oak	*Quercus macrocarpa*
cattail	*Typha* spp.
common bearberry	*Arctostaphylos uva-ursi*
cotton grass	*Eriophorum* spp.
cottonwood	*Populus deltoides*
creeping juniper	*Juniperus horizontalis*
crowberry	*Empetrum nigrum*
dwarf birch	*Betula glandulosa*
dwarf Labrador tea	*Ledum decumbens*
dogwood	*Cornus stolonifera*
elm	*Ulmus americana*
eastern white cedar	*Thuja occidentalis*
feathermoss	*Pleurozium* spp.
fescue	*Festuca scabrella*
fireweed	*Epilobium angustifolium*
fowl-meadow grass	*Poa palustris*
green ash	*Fraxinus pennsylvanica*
jack pine	*Pinus banksiana*
June grass	*Koeleria cristata*
Kentucky bluegrass	*Poa pratensis*
Labrador tea	*Ledum groenlandicum*
Lapland rose-bay	*Rhododendron lapponicum*
lichen	*Cladina, Cladonia, Cetraria* spp.
little bluestem	*Andropogon scoparius*
low sweet blueberry	*Vaccinium angustifolium*
Manitoba maple	*Acer negundo*
needle-and-thread	*Stipa comata*
northern wheat grass	*Agropyron smithii*
pondweed	*Potamogeton* spp.
purple saxifrage	*Saxifraga oppositifolia*
reed	*Phragmites australis*
reed grass	*Calamagrostis inexpansa*
red pine	*Pinus resinosa*
reindeer moss	*Cladina rangiferina*
rock cranberry	*Vaccinium vitis-idaea*
sand grass	*Calamovilfa longifolia*
saskatoon	*Amelanchier alnifolia*
sedges	*Carex* spp.
soapberry	*Shepherdia canadensis*
sphagnum moss	*Sphagnum* spp.
switch grass	*Panicum virgatum*
tamarack	*Larix laricina*
white pine	*Pinus strobus*
white spruce	*Picea glauca*
white-top grass	*Scolochloa festucacea*
willows	*Salix* spp.

Source: H.J. Scoggan, *The Flora of Canada* (Ottawa: National Museum of Natural Sciences, 1978).

Appendix 4.2 Common and Binomial Names of Animals Mentioned in Chapter 4

American kestrel	*Falco sparverius*
beaver	*Castor canadensis*
black bear	*Ursus americanus*
blue jay	*Cyanocitta cristata*
Canada goose	*Branta canadensis*
caribou	*Rangifer tarandus*
coyote	*Canis latrans*
fisher	*Martes pennanti*
garter snake	*Thamnophis* spp.
gray wolf	*Canis lupus*
lynx	*Lynx canadensis*
mink	*Mustela vison*
moose	*Alces alces*
muskrat	*Ondatra zibethica*
plains bison	*Bison bison bison*
polar bear	*Ursus maritimus*
raccoon	*Procyon lotor*
red fox	*Vulpes vulpes*
sharp-tailed grouse	*Pedioecetes phasianellus*
snowshoe hare	*Lepus americanus*
timber wolf	*Canis lupus*
weasel	*Mustela erminea*
white-tailed deer	*Odocoileus virginianus*
wood bison	*Bison bison athabascae*

Source: R.E. Wrigley et al., *Animals of Manitoba* (Winnipeg: Manitoba Museum of Man and Nature, 1974).

Case Study 4.1
The Spruce Woods Sandhills
Al Rogosin

The Spruce Woods Sandhills region of southwestern Manitoba is one of the more picturesque parts of the province, interesting for its landforms, the diversity of its biota, and its history (geomorphological, vegetation-wildlife, and human). Although similar features occur elsewhere on the upper Assiniboine Delta, the best examples are found within and near Spruce Woods Provincial Park and Canadian Forces Base (CFB) Shilo (Figure 4.1.1). The area is sometimes called the Carberry Desert,[1] but only the portion consisting of active dunes, the most striking and highly publicized landforms, evokes a desert image. At present, most of the sandhills are stabilized by plant cover. The main area of contiguous uninterrupted dunes (both stabilized and active) is estimated at about 960 km², the fourth-largest such region in Canada.[2]

Southwestern Manitoba was the first part of the province to be clear of Late Wisconsinan ice and the waters of glacial Lake Agassiz,[3] and was thus the earliest postglacial land surface available for occupation. It was used by peoples of the Paleo-Indian and later cultures (Chapter 5). The first fur-trading post in the area, Pine Fort (Figure 4.1.1), was built on the banks of the Assiniboine in 1767–68 (by the partners Forrest Oakes, Charles Boyer, and Thomas Curry, free-traders from Montreal, it is believed).[4]

The late 1800s were years of active homesteading by white settlers.

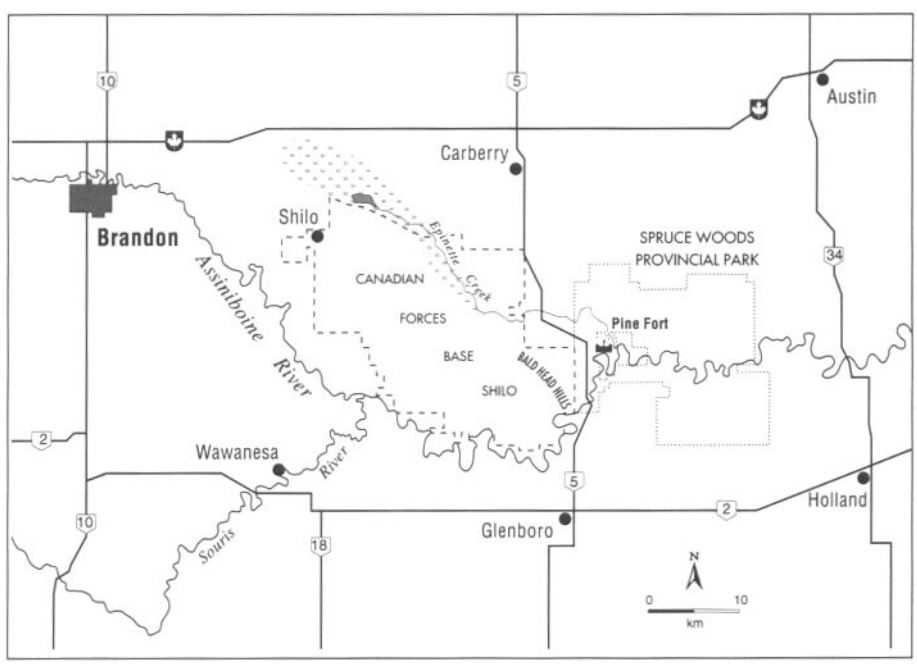

Figure 4.1.1 Location of the Spruce Woods Sandhills Region

Some early residents, including members of the Criddle family and Ernest Thompson Seton, made important detailed records of the area's natural features.[5] In 1895, because of the land's generally low agricultural potential, the provincial government designated it the Spruce Woods Forest Reserve. Later, the western portion (now CFB Shilo) was used for military training, and in 1970, in the eastern portion, Spruce Woods Provincial Park was opened (Figure 4.1.1).[6]

The massive sand deposits, up to about 70 m thick, resulted from the melting of the Late Wisconsinan ice sheet in this part of the continent.[7] The Assiniboine Valley served as a major spillway for the sediment-laden meltwaters, which entered glacial Lake Agassiz near Brandon, forming a large delta. Recent studies[8] suggest that this feature, or most of it, should be treated as an underflow fan rather than as a classic "Gilbert-type" delta.

As the lake drained, the sediments were exposed and reworked by wind into landforms ranging from low mounds and hills to true dunes. The most common type is the parabolic dune, often quite elongated. These may be grouped in large complexes, appearing as a series of "waves" or "chains." In the area known as the Bald Head Hills (Figure 4.1.2), where most large-scale eolian activity now occurs, the active dunes "appear to be transitional forms between

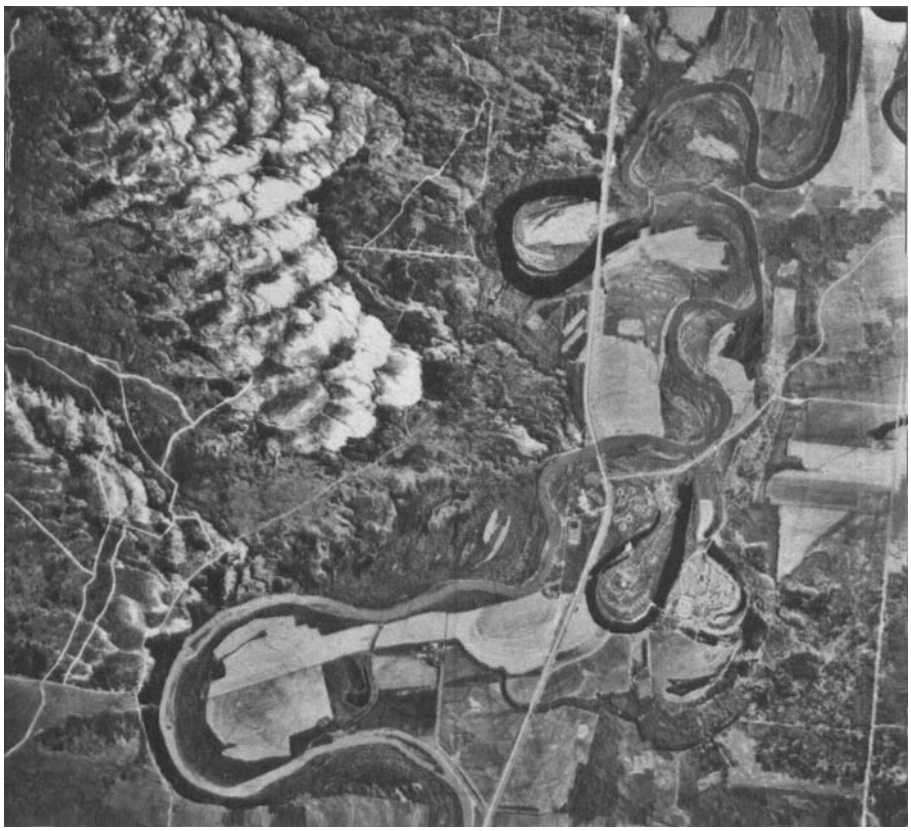

Figure 4.1.2 A Portion of the Active Dunes (The Bald Head Hills). The Assiniboine River meanders through the area with two prominent oxbow lakes — one east and the other west of highway 5 — indicating its former position; the eastern oxbow is used as a swimming area in the Spruce Woods Provincial Park. North is at the top of the photograph. (Photograph: MAPL MB 92010-36)

transverse dunes and parabola dunes of large curvature."[9]

Once covered by vegetation, the sand is protected from further movement by wind. If part of that cover is destroyed (due to vehicles, cultivation, military activity, overgrazing, road building, burrowing animals, fire, prolonged drought, etc.), the sand is exposed to further erosion. There has been a history of cycles of erosion and stabilization, with great variation in the area covered by active dunes. These now comprise about 25 km^2,[10] less than 5 percent of the contiguous sandhill area. There has been extensive recolonization by aspen (*Populus tremuloides*).[11] Direct evidence of long-term cycles is provided by buried paleosols revealed in road cuts.[12] These have climatic implications, suggesting periods of favourable, relatively moist conditions alternating with major drought periods. "This dune area is considered to be one of the most important ones in Canada because of the volume and complexity of information that can be obtained from it on eolian studies."[13]

In the past, animal life in the area was much more diverse than at present. The only large mammals resident in the area today are wapiti/elk (*Cervus canadensis*), moose (*Alces alces*), and white-tailed deer (*Odocoileus virginianus*).[14] Black bears (*Ursus americanus*) and wolves (*Canis lupus*) occasionally wander in, probably from Riding Mountain National Park to the north.[15] This is the only part of Canada where the northern prairie skink (*Eumeces septentrionalis*), a lizard, occurs.[16] The western hognose snake (*Heterodon nasicus*) and the plains spadefoot toad (*Scaphiopus bombifrons*), both relatively uncommon in Manitoba, are also found here.[17]

This area lies in a region where three major North American vegetational formations overlap: the Grassland (or "Prairie"), the Boreal (Northern Coniferous) Forest, and the Temperate (Eastern) Deciduous Forest. Much of the vegetation, therefore, is of a transitional nature.[18] Plants characteristic of all the above formations are present, their distribution influenced by such factors as topography, soil, drainage, history of use (fire, grazing), etc. It is precisely this mix of vegetation types that provides much of the botanical and ecological interest and visual attractiveness of the area. The following are some important plant communities occurring in the Spruce Woods region.[19]

(1) *Xeric mixed-grass prairie* occupies much of the sandhills and sand plains. A particularly fine example of this type of prairie has been recommended for conservation under the International Biological Program. In many of the eroded sandy areas, a very troublesome introduced weed, leafy spurge (*Euphorbia esula*), has become established and is spreading.[20]

(2) *Savanna* is widespread. Aspen (or poplar), bur oak (*Quercus macrocarpa*), and white spruce (*Picea glauca*) are the common tree species scattered in a grassland matrix. Where tree density is sufficiently high, a *parkland* aspect is formed, a mosaic of tree groves and prairie. Aspen is the most abundant tree. The relative amounts of grassland and woodland have been strongly influenced by fire, a regular feature of prairie history.[21]

(3) A *boreal* type of forest, dominated by white spruce, occurs in parts of the sandhills, generally with such characteristic understorey species as bunchberry (*Cornus canadensis*) and twinflower (*Linnaea borealis*).

(4) A *broadleaf forest* with species characteristic of the temperate deciduous forest is found in sites with more available moisture, particularly on the floodplain of the Assiniboine. The common tree species are Manitoba maple/box elder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), cottonwood (*Populus deltoides*), and basswood (*Tilia americana*).

(5) *Aquatic* and *wetland* communities are found in spring-fed sites along the Assiniboine Valley and in old meander channels of the river. A particularly noteworthy type of wetland, unusual for southwestern

Manitoba, occurs in the upper drainage area of Epinette Creek (Figure 4.1.1). Besides common, widespread species[22] in the Aspen Parkland region, this fen has such characteristically boreal species as larch/tamarack (*Larix laricina*), black spruce (*Picea mariana*), pitcher plant (*Sarracenia purpurea*), and sundew (*Drosera rotundifolia*). The nearest major boreal communities occur in the Riding Mountain uplands, some 100 km north and 300 m higher.

There have been marked post-glacial changes in vegetation in this region, indicated by evidence from preserved pollen and plant macrofossils in cores from lake-bottom sediments. The following general picture is suggested.[23] An early spruce-dominated forest persisted until about 10,000 years ago. It was replaced by a relatively long prairie phase, reflecting a warmer, drier climate. For a time, the prairie extended further north than it does today, and the boreal forest was also displaced northward. With a change to cooler conditions, this forest boundary moved southward between 2,000 and 3,000 years ago. Major vegetational patterns have remained essentially the same since.

The spruce, or, more generally, the boreal forest element of the vegetation in this area has often been interpreted as "relict," in the sense of having persisted from early postglacial time. The above interpretation of the pollen evidence, however, suggests that in terms of *continuous occupation*, the boreal forest element here may go back only about 2,000–3,000 years, rather than 10,000–12,000 years.

NOTES

1. Other names sometimes used for the region are Carberry Sandhills, Brandon Sandhills (not to be confused with the Brandon Hills, located further west), and Carberry Spruce Hills.
2. P.P. David, "Sand Dune Occurrences of Canada: A Theme and Resource Inventory Study of Eolian Landforms of Canada," Contract No. 74-230, unpublished report (Montreal: Department of Geology, Université de Montréal, and National Parks Branch, Department of Indian and Northern Affairs, 1977), 63. David lists three larger occurrences, in decreasing order of size: the Richardson River Sand Hills in northeastern Alberta, the Archibald Lake Sand Hills in northwestern Saskatchewan, and the Great Sand Hills in southwestern Saskatchewan. The first two are part of the extensive system of dune fields south of Lake Athabasca.
3. A.S. Dyke and V.K. Prest, *Paleogeography of Northern North America, 18,000–5,000 Years Ago*, Map 1703A (Ottawa: Geological Survey of Canada, 1987); A.S. Dyke and V.K. Prest, *Late Wisconsinan and Holocene Retreat of the Laurentide Ice Sheet*, Map 1702A (Ottawa: Geological Survey of Canada, 1987).
4. T.P. Tottle, *The History and Archaeology of Pine Fort*, Papers in Manitoba Archaeology, Preliminary Report No. 7 (Winnipeg: Department of Cultural Affairs and Historical Resources, Historic Resources Branch, 1981). There were three different occupations of this locality by different fur-trading companies, involving at least two separate forts. Information concerning this earliest period "is skimpy, and historians are not quite sure as to who the founders were" (p. 14). Later forts were controlled by the North West Company.
5. Accounts of the area and of the work of the persons mentioned are found in R.D. Bird, *Ecology of the Aspen Parkland of Western Canada* (Ottawa: Canada Department of Agriculture, Research Branch, 1961); A. Criddle, *Criddle-de-Diddle-Ensis: A Biographical History of the Criddles of Aweme, Manitoba, Pioneers of the 1880s* (Winnipeg: A. Criddle, 1973); E.T. Seton, *Trail of an Artist-Naturalist: The Autobiography of Ernest Thompson Seton* (New York: C. Scribners, 1940); and E.T. Seton and C.S. Houston, *Ernest Thompson Seton in Manitoba, 1882–1892* (Winnipeg: Manitoba Naturalists Society and Premium Ventures, 1980).
6. J.E. Dubois, ed., *The Sandhills of Carberry* (Winnipeg: Manitoba Museum of Man and Nature, 1976).
7. E.C. Halstead, *Ground-Water Resources of the Brandon Map Area, Manitoba*, Memoir 300 (Ottawa: Geological Survey of Canada, 1959), 10–5, and Map 1067A, Surficial Geology; J.T. Teller, "The Ice Age and Its Legacy," in *Natural Heritage of Manitoba: Legacy of the Ice Age*, ed. J.T. Teller (Winnipeg: Manitoba Museum of Man and Nature, 1984), 23–47; and J.T. Teller and L. Clayton, eds., *Glacial Lake Agassiz*, Special Paper 26 (St. John's, NF: Geological Association of Canada, 1983). This last work updates (to 1982) the research done since the mid-1960s. Particularly relevant here are the chapters by J.A. Elson, by N.M. Fenton et al., and by R.W. Klassen.
8. N.M. Fenton et al., "Quaternary Stratigraphy and History in the Southern Part of the Lake Agassiz Basin," in Teller and Clayton, *Glacial Lake Agassiz*, 54–7, 66–7.
9. David, "Sand Dune Occurrences of Canada," 64. Except where noted otherwise, much of the information concerning sand dunes in this and the following paragraph is taken from this reference (pp. 63–6).
10. From data in Dubois, *The Sandhills of Carberry*, and David, "Sand Dune Occurrences of Canada."
11. Bird, *Ecology of the Aspen Parkland*, 26–9; L.A. Stuckey, personal communication, 1990; and Scott (Chapter 4 herein).
12. P.P. David, "The Brookdale Road Section and Its Significance in the Chronological Studies of Dune Activities in the Brandon Sand Hills of Manitoba," in *Geoscience Studies in Manitoba*, ed. A.C. Turnock (Toronto: Geological Association of Canada, Business and Economic Service Ltd., 1971), 293–9.
13. David, "Sand Dune Occurrences of Canada," 66.
14. Bird, *Ecology of the Aspen Parkland*, 55–82; A.B. Ransom, "Preliminary Wildlife Management Studies of the Spruce Woods Provincial Park," unpublished report (Winnipeg: Parks Branch, Manitoba Department of Natural Resources, 1969); and R.E. Wrigley, "Mammals of the Sandhills of Southwestern Manitoba," *Canadian Field Naturalist* 88(1974):21–39.
15. Wrigley, "Mammals of the Sandhills of Southwestern Manitoba," 34.
16. E.J. Bredin, "Distribution of the Northern Prairie Skink in Manitoba," Biological Services MS Rep. 81–17, unpublished report (Winnipeg: Manitoba Department of Natural Resources, 1981); W.B. Preston, *The Amphibians and Reptiles of Manitoba* (Winnipeg: Manitoba Museum of Man and Nature, 1982), 78–80.
17. Preston, *The Amphibians and Reptiles of Manitoba*, 45–7, 90–2.
18. Rowe's 1972 map shows the Spruce Woods area as an extreme southeastern outlier of the mixed-woods section of the Boreal Forest Region, surrounded by what is usually called aspen parkland. J.S. Rowe, *Forest Regions of Canada*, Publication 1300 (Ottawa: Department of the Environment, Canadian Forestry Service, 1972); Scott's map (Figure 4:1 herein) shows the Spruce Woods area, although not specifically outlined, lying within the Transitional Grassland Ecoclimatic Region (Gt) of the Grassland Ecoclimatic Province. His map of the potential natural vegetation of Manitoba (Figure 4:2 herein) shows our area as an island of mixed-woods (MW) within a larger area of aspen parkland (AP). See also the discussion in J.C. Ritchie, *Postglacial Vegetation of Canada* (Cambridge: Cambridge University Press, 1987), 3–6, 11–4, and the map produced by E.B. Wilken, C.D.A. Rubec, and G. Ironside, *Canada Terrestrial Ecoregions, Map MCR 4164* (Ottawa: National Atlas Information Service, Canada Centre for Mapping, Energy, Mines and Resources Canada; and State of the Environment Reporting, Environ-

ment Canada, 1993).

19. See Scott (Chapter 4 herein) for a brief account of the species composition of communities; also C.T. Shay, "The History of Manitoba's Vegetation," in *Natural Heritage of Manitoba,* 93–125.
20. Studies of this and related problems associated with military activity are being conducted at CFB Shilo. See J.M. Shay et al., *The Effect of Military Activity on Mixed-Grass Prairie, CFB Shilo* (Winnipeg: Department of Botany, University of Manitoba, 1989); and D.L. Kunec and J.M. Shay, *The Effect of Military Activity on Native Mixed-Grass Prairie, CFB Shilo, Supplementary Report* (Winnipeg: Department of Botany, University of Manitoba, 1990).
21. The literature contains many references to the role of fire in the relationship between prairie and forest cover. See Bird, *Ecology of the Aspen Parkland;* Ritchie, *Postglacial Vegetation of Canada;* C.T. Shay, *The History of Manitoba's Vegetation;* and Scott (Chapter 4 herein).
22. See Scott (Chapter 4 of herein); and National Wetlands Working Group, *Wetlands of Canada,* Ecological Land Classification Series, 24 (Ottawa: Environment Canada Sustainable Development Branch, Canadian Wildlife Service; and Montreal: Polyscience Publications, 1988), 157–93.
23. Ritchie, *Postglacial Vegetation of Canada,* 96–105, 124–30, 134–44; J.C. Ritchie, "The Late-Quaternary Vegetational History of the Western Interior of Canada," *Canadian Journal of Botany* 54(1976):1793–818; and C.T. Shay, *The History of Manitoba's Vegetation,* 94–106.

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PART 2

PEOPLE AND SETTLEMENTS

Although the physical environments of Manitoba are distinctive and important to an understanding of the character of the province, it is, as George Perkins Marsh pointed out as far back as 1864, the human response to these environments that has created the personality of places such as Manitoba.

In Chapter 5, B. Nicholson details the current understanding that we have of the late prehistoric and protohistoric human settlement of, and subsistence within, this region. The diversity of this development is indicated, as is its sophisticated relationship to the different ecological niches in the province. A discussion of the new techniques and material goods that resulted from this original peopling of the province is discussed, and the importance of recently investigated ways of life, including farming (Case Study 5.1 on page 77), is detailed.

B. Kaye (Chapter 6) picks up this thread for historic times, and brings it through to the time that Manitoba became the "postage stamp province" in 1870. The economic benefits gained for Britain as well as for Canada and Manitoba are indicated, as are some of the physical and biotic changes wrought by this incipient transformation of the natural landscape into a cultural landscape. The early contribution of the Métis is discussed by G. Ens (Case Study 6.1 on page 89), as are their seasonal migration patterns, which typified the hopes and anticipations of this truly Canadian culture, soon to be disrupted by the arrival of another wave of migrants.

With the close of the fur trade era and the beginning of large-scale agriculture, the province became less desirable to its earliest inhabitants, as it began to assume its contemporary face. The construction of these more permanent cultural landscapes is presented by J. Lehr (Chapter 7). He demonstrates that the settling of the prairies resulted from the perception of opportunities by agriculturalists. Such perceptions are invariably a combination of reality and desire, with the latter often dominating in the Manitoba context. This mixture was frequently clouded by myth, and the gap between what the migrants expected and what was actually available was never bridged for some, who then moved on to greener pastures.

The ramifications of landscape ordering can be seen in many ways. One of the major building blocks for agricultural settlement in Manitoba was the geometric subdivision of the land into a regular skeleton of blocks, the Township and Range system, which formed the bases of future farms and towns, as explained by J. Richtik (Case Study 7.1 on page 102). A variety of settlement types evolved, some more successful than others. One that did not make it, Asessippi, is illustrated by D. McDowell (Case Study 7.2 on page 103). Conversely, other groups and other settlements have been very successful, including, as Richtik points out, the Mennonites (Case Study 7.3 on page 105).

Although people have lived in what is now Manitoba for several

thousand years, only since the province became part of Canada did population numbers increase significantly, as a result of both natural growth and migration. Migration can be looked at from three angles: the catalyst for movement, the effect of the movement on the people in motion, and the consequences of such a movement.

In Manitoba, as elsewhere, this led to shifting and complex patterns and processes. In the early years, as C.E. Haque demonstrates (Chapter 8), population growth accelerated quite rapidly; but more recently growth has been slow, and projections indicate that this is most likely the pattern for the foreseeable future. The net effect of these changes has been to create a distinct type of settlement distribution in Manitoba, but one that is still in flux. A major reason is that immigration has decreased, emigration has become more important, and the population has become, as G.C. Smith shows, older and "grayer" (Case Study 8.1 on page 119).

Other recent demographic and cultural changes that reflect in part these demographic shifts include a change in religious practices (as shown by L. Nixon in Case Study 8.2 on page 121). Although we do not always recognize its importance, much of the history of the region, including demographic and religious factors — two of the most interesting aspects of spatial organization — can be seen in, and gleaned from, one of the most ubiquitous features of the cultural landscape, the cemetery (J. Darlington, Case Study 8.3 on page 122).

An important part of Manitoba's cultural heritage has always been tied to its First Nations population. The massive immigration of "European settlers" detailed by Lehr and Haque had dramatic effects upon the lifestyles of the First Nations population. In other parts of the world, such inflows have led to a migration of the Aboriginal population to more desirable areas, but the takeover of the "last best west" was so complete that there was quickly nowhere to move. Consequently the Aboriginal population of Manitoba had little choice but to stay in the province — albeit in a set of much restricted areas (reserves) and impoverished ecological niches, where they had to recreate their cultural landscapes. In Chapter 9, S. Corrigan and R. Annis detail the Aboriginal settlement of the province, and these peoples' "resettlement" on reserves (Case Study 9.1 on page 133) after their unsuccessful contact with the new Canadian population. R. Mason and R. Annis include a case study (9.2 on page 134) of one of these new cultural areas, discussing contemporary life on the St. Theresa Point reserve.

Winnipeg dominates the province in many ways. It is the capital city and the primate city of Manitoba, with 60 percent of the province's population and much of its economic activity. Since the early days of settlement in Manitoba, the junction of the Red and Assiniboine rivers has been an important meeting place, and T. Carter discusses the historical and contemporary significance of this location (Chapter 10). He shows that Winnipeg, unlike many other urban settlements on the Prairies, is a fine example of a city of contrasts and innovation, and that it reflects a number of cultural influences — ranging from Red River lots to postmodern building styles — in its settlement morphology and cultural landscapes.

It is in the urban realm that people have most clearly expressed their desire for organized space, and Winnipeg, perhaps the province's most dramatic manipulation of the landscape, is certainly no exception to this general rule. Manitoba's capital has been fortunate that, partly as a result of its economic frailty in recent years, many of its heritage landscapes have been preserved. But Winnipeg is now struggling to effectively enter the 21st century, and The Forks "festival market" development discussed by Carter (Case Study 10.1 on page 150) is an excellent example of the city's attempt to maintain and enhance its metropolitan presence within the urban fabric of the country.

In another chapter (Chapter 11), C. Stadel writes of a region composed largely of non-metropolitan settlements, which can be seen as the basic building blocks of our settlement system models, and which have transformed the regional space economy over the past century. For although Winnipeg contains most of Manitoba's population, the settlements outside the Perimeter Highway are numerous and have played critical roles in the development of southern Manitoba. Stadel discusses the settlement system of southern Manitoba, evaluates its development, and details the possibilities for its sustainability.

The future of some of the central places in the province seems assured, but the success of others is much less certain and may depend upon the influences of individual boosters within these towns. Two case studies illustrate some of these points. In Case Study 11.1 (page 161), W.G. Hillman looks at Strathclair, which despite early growth is now in decline and may be fighting for its very survival. H. Sikora (Case Study 11.2 on page 164) discusses Dauphin, a town created by the railway that has come to dominate the parkland region, but which is now also in a period of readjustment because the settlement depends upon a rural economy that is itself threatened.

Much of Manitoba may be considered as part of Canada's "North," with a set of landscapes that still owes more to physical than cultural forces. In Chapter 12, A. Kienetz looks at northern living, focusing on the (often short-lived) resource towns of this region. These have economic, demographic, and social patterns that are quite different from those of their southern counterparts, as well as distinctive urban morphologies. They have often been characterized as "wilderness suburbs" — transplanted southern communities in isolated northern settings.

A major centre in Manitoba's north has been Churchill, particularly since the Hudson Bay Railway was completed to this port in 1929. G. Sweet (Case Study 12.1 on page 172) discusses the past and present fortunes of this centre, whose future is also likely to be more a function of political forces than spatial logic. Manitoba's north

is sporadically settled and often poorly serviced. Communications in winter are particularly difficult, and in some parts are practical only through the use of winter roads. R. Foster (Case Study 12.2 on page 175) discusses the growth of this communications system and details its critical role as a lifeline for many of Manitoba's northern communities.

Politics have played an important part in the development of all aspects of life of Manitoba in the past, and may help to determine the future of this region. But politics and its geographical manifestations are also interesting in themselves to the geographer. M. Serfaty demonstrates the convergence of politics and geography in Chapter 13 by detailing the spatial development of party politics within the province over the past century. Although the patterns of political support have changed over the years, these can be explained and to some extent predicted by an understanding of the province's society, demography, and economy.

In Case Study 13.1 (page 189), L. Clark discusses the case of Brandon-Souris, a parliamentary riding that he represented in Ottawa for several years, and shows how seemingly chance factors can influence the outcome of federal elections. Serfaty (Case Study 13.2 on page 192) explains the framework of local government in Manitoba, a system that apart from Winnipeg has changed little since the early days of the province. From several points of view the rectangular, uniformly shaped administrative districts make little sense. Various measures have been taken to overcome the problem, including the creation of planning districts (R. Tompkins, Case Study 13.3 on page 193).

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LATE PREHISTORIC AND PROTOHISTORIC SETTLEMENT AND SUBSISTENCE IN SOUTHERN MANITOBA

5

B.A. Nicholson

The term "archaeological culture," which is used in chronologies of prehistory, requires explanation. Usually, an archaeological culture is recognized through the recurrence of particular clusters of traits, such as hearth design, patterns of site distribution, or, most specifically, artifacts[1] that are the unique products of human technology. When the artifacts of past groups living in a region at a particular time are found to contain similar clusters of traits, these assemblages are described and assigned to an "archaeological culture."

Over the years, archaeologists have developed systems that rigorously define traits and have proposed hierarchical schemes that differentiate the degrees of relatedness between clusters of assemblages through time and space. In these schemes, the emphasis is on the trait and especially on the diagnostic artifact. Some artifacts, such as Besant points, or certain ceramic wares, such as Selkirk, have proven to be reliable time markers and to be closely associated with the way of life of the people who manufactured them. Other artifacts, such as lithic scrapers and bone awls, are less useful for defining cultures.

Terms such as "Besant" and "Blackduck" refer to the presence of distinctive artifacts or traits recognized as belonging to known archaeological cultures. In most cases, the social units associated with the archaeological complexes cannot be deduced, but the occurrence and distribution of the archaeological remains are evidence for the distribution and spread of patterns of material culture and of related adaptive living strategies. In the following sections, archaeological and early historic complexes that have been identified in southern Manitoba (the study area) are described. The places of origin for these complexes will be discussed, and the timing and direction of the movement of people and technological innovations into the region will be indicated, together with inferred subsistence strategies.

The term "prehistoric" refers to times past for which there is no written documentation, whereas the term "protohistoric" refers to the time period immediately preceding historic contact for which third-party accounts and accounts of the reminiscences of long-deceased elders form the basis for social reconstructions. This was a time when Aboriginal societies that had not directly encountered Europeans felt the ripple effect of westward displacement of Aboriginal groups by European settlers on the east coast of North America, and when small numbers of trade goods filtered into the area through Aboriginal middlemen.

ECOLOGICAL SETTING

Since all of southern Manitoba was at one time deeply buried beneath the Late Wisconsinan continental ice sheet, it is evident that the initial colonists were immigrants from outside areas. Further, since the area east of the Manitoba Escarpment was inundated by the waters of glacial Lake Agassiz until some time after 7000 B.C.,[2] colonization of the western portion of the region before this date necessarily flowed from the south and west.

With the onset of the Hypsithermal warming trend, the boreal forest retreated northward and the grasslands expanded dramatically to cover most of southern Manitoba. During the Hypsithermal maximum, about 3500 B.C., the region to the east of the Manitoba Escarpment was probably a xeric grassland containing a few brackish lake remnants but generally deficient in freshwater and other subsistence resources.[3]

Until the decline of the Hypsithermal climatic episode some 1,000 years later, entry into southern Manitoba may have been limited to a southward trickle of hunters and gatherers from the parklands to the north, and small numbers from the west along river systems such as the Qu'Appelle/Assiniboine, the Saskatchewan/Carrot, and the Swan. The wetter post-Hypsithermal conditions favoured an expansion of the parklands and southward movement of the boreal forest. The discharge of rivers increased, and the Manitoba Lowlands now provided an abundance of seasonal resources, together with an increase in forest habitat for populations of moose, beaver, bear, and other localized year-round resources such as muskrat.[4] This expanded forest and parkland created a large territory suitable for the forest-adapted peoples, and provided localized areas suited to prehistoric horticulture.[5]

Three major biomes are significant for subsistence and settlement in southern Manitoba (Figure 5.1). The Plains region, which formed the summer pasturage for the northern bison herds,[6] lies mainly outside the study area, but it must be considered because of the seasonal movements of the bison herds and of the Native groups that relied on those herds. The Parklands form a major portion of the southern and western sections of the province, and extend for a considerable distance to the north and west. The Boreal Forest covers the northern and eastern edges of Manitoba.

Besides the major biomes, several ecotone complexes were significant in prehistoric subsistence systems. The mixed-woods complexes[7] are a major component of the Manitoba Escarpment uplands, and riverine complexes held important seasonal resources in the southern part of the region. Similarly, the riparian resources of parts of the southern boreal forest were potentially significant. Many of the plant and animal resources found in the three major biomes occurred in greatest abundance in these ecotones, or were aggregated there on a seasonal basis.

Subsistence resources in the Plains are available primarily during the growing season, and the resources of the Northern Plains biome did not permit the development of year-round subsistence strategies for human populations before the advent of farming and a market economy.[8]

In contrast, the Parklands biome contained a wide range of resources. Subsistence strategies could be based upon several large ungulates (moose, elk, bison, mule deer) together with bears and aquatic rodents, supplemented by seasonally abundant waterfowl, fish, and vegetable foods. Subsistence based entirely upon the resources of the parklands, and involving frequent shifting of base camps as resources were depleted, was eminently feasible.

The resources of the Boreal Forest biome tend to be thinly spread and accessible primarily along rivers and lakeshores. Many of the forest resources are available throughout most seasons of the year, although procurement may be difficult at times. Migratory waterfowl and plant foods are markedly seasonal. Fish, moose, woodland caribou, beavers, and bears formed the mainstay of boreal forest subsistence, and could be supplemented by smaller species, particularly muskrat and rabbit. Vegetable foods, including wild rice where available, and numerous roots, berries, and tubers, were important seasonal supplements for immediate use, or could be stored for winter.[9]

The ecotones within the major biomes offered sufficient resource potential for small bands to develop subsistence strategies involving limited mobility within sections of valley complex, mixed-woods, or riparian habitat. These adaptive strategies, however, were predicated upon exclusive access to the ecotone, and on management that maintained a favourable balance of people versus resources, since resource extraction must not exceed the carrying capacity of the resource base. If resource extraction were to exceed the rate of replenishment, the resource base would have to be expanded, either territorially, or by a broadening of the exploitation strategy to include new resources, or by concentrating on resources previously exploited at a suboptimal level.

Figure 5.1 Generalized Map of the Ecozones of North America

LATE PREHISTORIC (200 B.C.–A.D. 1650)

At this time there is clear evidence for diffusion of people and ideas from the Eastern Woodlands into the Central and Northern Plains (Figure 5.1). Following the Hypsithermal, this diffusion may have been a response to changing environmental opportunities as the parklands expanded into the grasslands,[10] bison numbers increased and their patterns of movement changed.[11] This diffusion may also have resulted from the demographic increase and westward expansion of Hopewell populations from the Eastern Woodlands around A.D. 100.[12]

During the Late Prehistoric period, a heterogeneous but interrelated social and cultural configuration began to develop, spreading

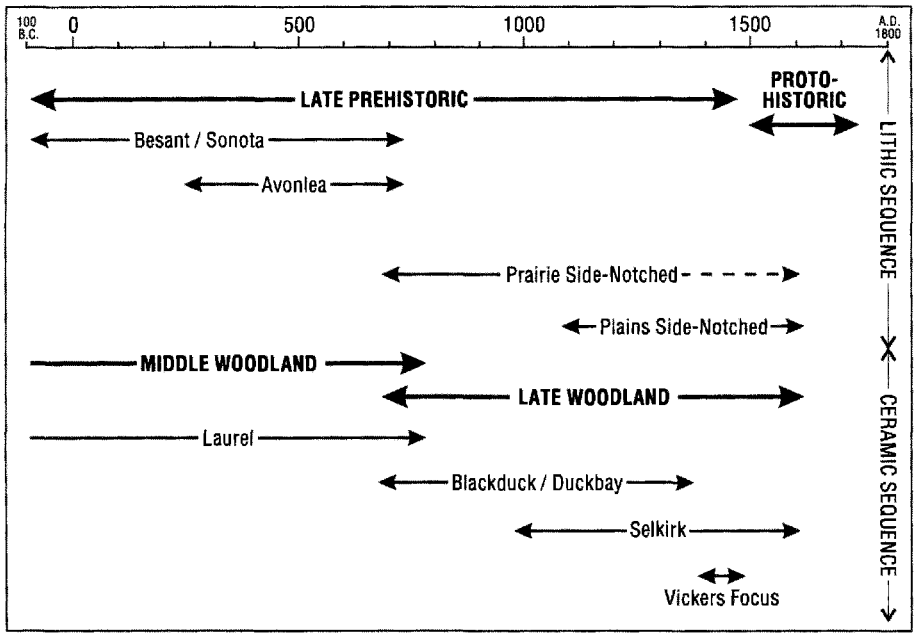

Figure 5.2 Time Lines for the Late Prehistoric and the Protohistoric of Manitoba

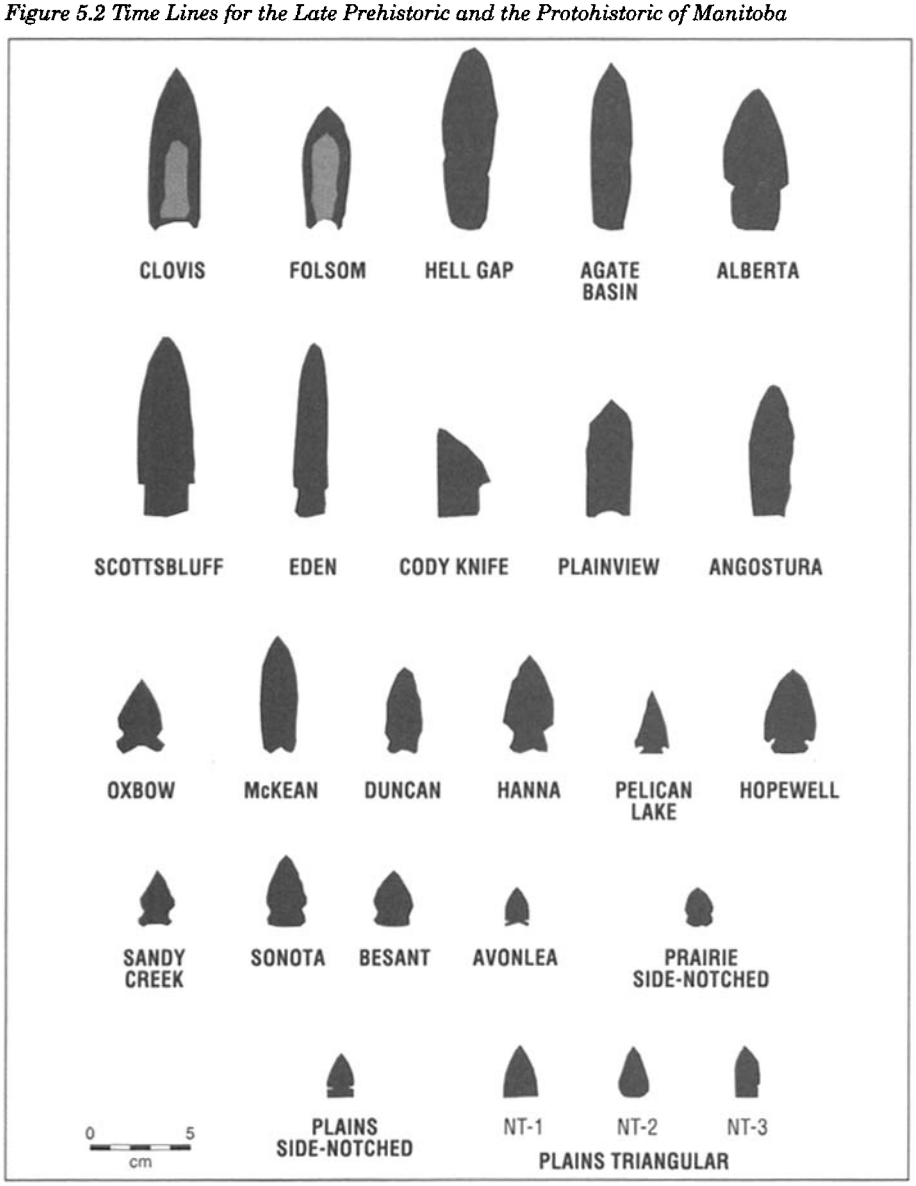

Figure 5.3 Projectile Points Found in Southern Manitoba

over the plains, parklands, and southern boreal forest. It was characterized by a set of artifacts that included small side-notched points, unnotched triangular points, and fabric-impressed ceramics. There is also evidence for a late diffusion of technological traits from the Middle Missouri area into the Northern Plains[13] as woodland cultures encountered plains-oriented cultures. Ceramics began to appear in sites occupied by successors to aceramic groups, and new lithic styles began to occur with established ceramic complexes in the eastern margins of the plains. The following sections briefly discuss the lithic tools and ceramic wares that identify these groups.

The adaptive schemes that emerged in the Late Prehistoric period were diverse. Evidence for bison pounding is widespread in sites in the southwestern section of Manitoba, but in the northeast the importance of bison in archaeological assemblages diminishes, and forest and freshwater species dominate the faunal remains.[14] These adaptations are consistent with the known resources of the respective areas and are not considered a result of cultural choice. Besides these traditional hunter-gatherer subsistence strategies, there is evidence to suggest that limited amounts of horticultural activity supported some groups who immigrated from the Eastern Woodlands and the Middle Missouri areas.[15]

Lithics

Besant / Sonota

The Besant culture emerged in the Northern Plains about 100 B.C. and ended about A.D. 750 (Figure 5.2). The material assemblage is characterized by large side-notched projectile points (Figure 5.3) and verticalled cord-roughened conoidal ceramics (Figure 5.4).[16] A controversy concerning the relationship between the Sonota culture, characterized by large burial mounds and a preferred use of Knife River Flint (KRF) quarried in southwestern North Dakota, and the Besant culture, which lacked the burial mound trait and rarely used KRF, remains largely unresolved, although some relationship is evident.

Virtually all authorities agree that both the Besant and Sonota people had a strongly plains-oriented subsistence strategy in which bison played a primary role. In addition, there seems to be general agreement that the Besant/Sonota Complex had its origin on the eastern peripheries of the Northern Plains. Reeves[17] believes that Besant was technologically related to the Sandy Creek Complex,[18] which occurred widely across the Northern Plains and may have been derived from the earlier Oxbow Complex. Two major Sonota sites, the Muhlbach site[19] near Red Deer in southern Alberta and the Mullett site[20] near Hartney, Manitoba (Figure 5.5), both contain *in situ* Sandy Creek points, indicating some relationship between the two groups.

Besant/Sonota sites demonstrate the importance of bison. The Sonota burial mound complex includes partial and entire carcasses of bison as well as the remains of the hunters. Reeves's statement that "The [Besant] economy is based almost entirely on the communal hunting of bison by the use of traps, pounds, or jumps"[21] is supported by archaeological evidence at sites such as Mullett, Richards, and Wapiti Sakihtaw in Manitoba (Figure 5.5). It is, however, reasonable to assume that other animal and plant species were used as seasonal supplements, as in the case of plains/parkland-adapted bison hunters during the early historic period.[22]

Besant projectile points are ubiquitous in local surface collections, with the Sonota variant being more common towards the south. Both surface finds and excavations indicate that Besant/Sonota people occupied the entire southern Manitoba region about A.D. 200–750.

Avonlea

The Avonlea culture was a plains-oriented complex characterized by finely made side-notched projectile points (Figure 5.3) and, like Besant/Sonota, by large "mass-kill" bison sites. The complex appeared about A.D. 150–250 and ended on the Northern Plains about A.D. 750 (Figure 5.2), but persists for another 300 years in southern Alberta and the foothills. Avonlea coexisted with Besant and was common in southern Saskatchewan and Alberta but rare in Manitoba. An Eastern Woodlands influence is apparent in the ceramics, but any technological links with the lithic tools remain elusive.[23]

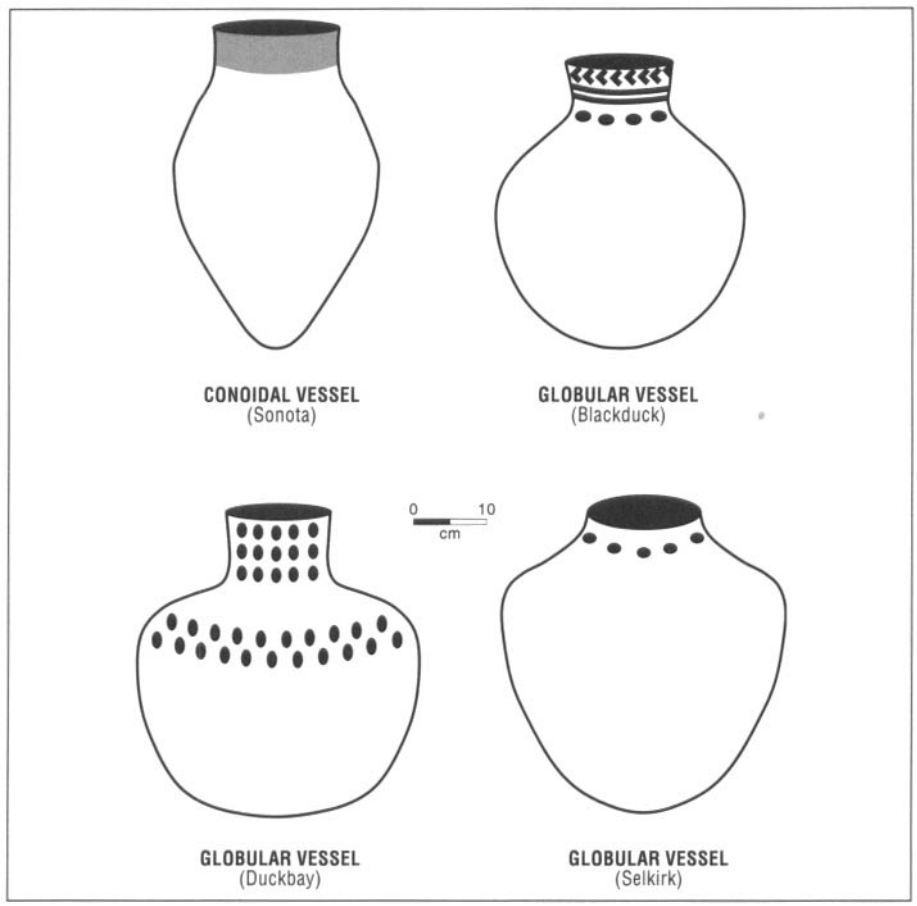

Figure 5.4 Pottery Found in Southern Manitoba

Avonlea points are found as isolated surface recoveries or in small numbers in mixed assemblages along the western edge of Manitoba, but no major sites have been identified. Occasional finds in excavated sites such as Stott, Heron, and Lovstrom (Figure 5.5) likely are the result of collection and reuse by later site occupants.

Prairie Side-Notched and Plains Side-Notched

The classification system "Small Side-Notched Point System of the Northern Plains" has been widely used to group and describe the range of variation found in the widespread small side-notched projectile points found throughout the Northern Plains and adjacent parklands from the Late Prehistoric period. Following the disappearance of Avonlea from the archaeological record about A.D. 750, there is a proliferation of small side-notched points (Figure 5.3) displaying mediocre flint-knapping skills in relation to the earlier, finely crafted Avonlea points. The time span generally attributed to these points is about A.D. 700–1200 on the Northern Plains, and points of this general type persisted in Manitoba into protohistoric times (Figure 5.2). About A.D. 1000, more finely made, small side-notched points began to appear, and these have been termed "Plains side-notched" by Kehoe.[24]

Small side-notched points are ubiquitous in the plains/parkland area, with local variations intergrading with each other as the bow and arrow replaced the atlatl dart. Dyck observes that "the distribution of Prairie and Plains complexes appears to be ubiquitous throughout the plains and parkland areas of Saskatchewan."[25] Late Prehistoric Prairie and Plains side-notched

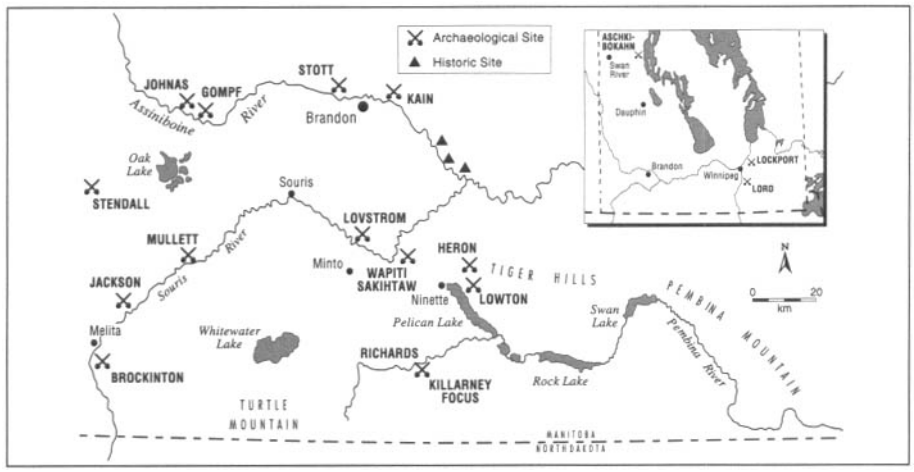

Figure 5.5 Archaeological and Historic Sites in Southern Manitoba

points blend imperceptibly with the Late Woodland points of the southern boreal forest,[26] and in southern Manitoba they are found everywhere, frequently associated with Late Woodland ceramics.

Ceramics

Because of the widespread distribution and limited variation of the diagnostic lithic tools, the Late Prehistoric period in southern Manitoba is explored primarily by means of the ceramic complexes of the Late Woodland period, which in many cases are associated with the lithic materials already described. The spatial and temporal distributions of the ceramic wares are more clearly defined than those of the lithics of the same period, and allow a more detailed examination of the movement and subsistence strategies of the groups that deposited them.

The Woodland period is divided into Early, Middle, and Late, and serves as a temporal guide in the chronologies of eastern North America over the past five millennia. In the southeastern United States, Early Woodland marks the end of the Archaic period about 2500 B.C. with the introduction of pottery. Middle Woodland is equated with the Adena and Hopewell cultures, and Jennings[27] suggests a time span of 900 B.C.–A.D. 800. Late Woodland cultures, including the Mississippian, emerged from Middle Woodland antecedents about A.D. 700 and persisted into the Protohistoric.

The term "Woodland" implies the general time frame given above. However, given the distances, diversity of habitat, and sociocultural variability between the Eastern Woodlands and the Northern Plains, there will be local differences in the assignment of absolute dates for the cultural groups. In southwestern Manitoba, the Eastern Woodland wares are sometimes found with plains Mortlach wares, and a scattering of Missouri Village wares are found in assemblages such as the Vickers Focus culture (to be described later).

Blackduck

Blackduck ceramics appear about A.D. 600–700 in the Upper Great Lakes region, with terminal dates about A.D. 1600–1750 north and west of Lake Superior (Figure 5.2). They extend from the north shore of Lake Superior across the northern third of Minnesota, through the Manitoba Lowlands into southwestern Manitoba, and north into the Lower Saskatchewan River drainage basin and along the Churchill River.

The distinctive Blackduck ceramics are notable for elaborate cord-wrapped object (CWO) impressed decoration on the rims and lips of globular vessels (Figure 5.4). Typically, the decorative traits that appear in various permutations on Blackduck vessels include CWO impressions, punctates (usually round but occasionally irregular or oblique), twisted-cord impressions, and linear impressions from smooth objects. The vessel bodies usually display fabric impressions that may be obliterated by smoothing. As with the small side-notched point system, researchers have developed descriptive categories for the combinations of design elements found on Blackduck vessels.[28] Invariably, these typologies are site-specific and fail to encompass the range of variability encountered at other sites.

Early Blackduck ceramics show some decorative similarities to earlier Middle Woodland Laurel vessels, although techniques of manufacture (coiling versus paddling and fabric moulds) are dissimilar. Buchner[29] has argued for cultural continuity throughout the Woodland period in southeastern Manitoba and the adjacent regions in Ontario, based upon similar artifact inventories and faunal remains in sites from this period.

It must be noted, however, that the ethnohistoric evidence indicates that continuity in subsistence strategy and associated technological items cannot be equated with ethnic continuity. For example, we know that in many areas the Assiniboine were succeeded by the Cree, who were in turn succeeded by the Ojibwa. The ethnohistoric and archaeological evidence indicates continuity of subsistence strategy for these three historic groups, but this is not equivalent to ethnic continuity in the Protohistoric archaeological record.

The subsistence strategies employed by the users of Blackduck ceramics were as diverse as the resource potential of the areas they inhabited. In boreal forest sites, faunal remains indicate a broad-based strategy that utilized fish, beaver, moose, woodland caribou, bear, and migratory waterfowl, as well as wild rice whenever it was available. In the Blackduck occupations of the southern Manitoba parklands, there is clear evidence of mass kills of bison at sites such as Stott, Gompf, Brockinton, and Stendall (Figure 5.5). However, as Blackduck material culture seems to be derived from the southern boreal forest to the east, where only individual or limited cooperative hunting was practiced,[30] it is unlikely that the social organization and the accompanying technology for communal bison hunting came from this direction.

Frison[31] has argued strongly that bison pounding required a well-disciplined social group and an exact and detailed understanding of bison behaviour. Given that communal bison procurement had been a major subsistence strategy on the plains for several millennia, it is more likely that the necessary complex of technology, organization, and lore was learned from groups already living in the region and involved in mass-kill bison procurement.

Most of the projectile points at the Stott site can be classified using the Small Side-Notched Point System of the Northern Plains.[32] A small number of side-notched points and a few unnotched triangular specimens cannot be fitted to the system. The Woodland points and ceramics, together with other Woodland artifacts (such as unilateral barbed harpoons) found in these mass-kill sites, indicates association with eastern groups. In the southern parklands of southern Manitoba, Blackduck appeared to incorporate technological and organizational traits from two major cultural adaptive systems: the Woodlands and the Plains.

All of southern Manitoba was utilized by users of Blackduck ceramics. The ceramics are found throughout the Interlake district of central Manitoba, along the Red River, and eastward into Northern Ontario. There is no evidence to indicate whether all these areas were used contemporaneously. Dates for single-occupation Blackduck sites in Manitoba range between 1170 ± 90 B.P. (A.D. 800) at the Lord site (Figure 5.5) and 465 ± 65 B.P. (A.D. 1500) at Wuskwatim Lake in northern Manitoba.

During a 700–800-year occupancy of southern Manitoba (about A.D. 700–1500), people identifiable by their use of Blackduck ceramics initiated a strategy that exploited bison by means of communal kills and utilized the resources of the forest and waterways. Initially, Blackduck people may have depended upon fish in spring and early summer; hunted ungulates in the parklands in late summer; and returned to the boreal forest in the fall to harvest wild rice and hunt beaver, moose, and woodland caribou in their familiar forest biome, as the Ojibwa did much later, during the Historic period.

Upon coming into contact with plains/valley complex or plains/parkland-adapted people, Blackduck users may have gradually increased their reliance upon bison, using late fall and winter hunts to accumulate a surplus of dried meat and pemmican to provide for the lean period in spring before spawning runs began and migratory waterfowl returned. At the southern margins of the Northern Boreal Forest, the forest/parkland adaptation persisted alongside the emerging Selkirk Horizon (described later), which lasted into the Historic period.

Duckbay

The distinctively decorated Duckbay ceramics (Figure 5.4) occur as a minor component in Late Woodland assemblages in southeastern Manitoba, in northern Minnesota, in the Manitoba Interlake region, in the uplands of west-central Manitoba, in southwestern Manitoba, and in east-central Saskatchewan. Duckbay sherds usually constitute less than 5 percent of the total ceramic assemblage. In Manitoba, Duckbay ware is usually associated with Blackduck and early Selkirk materials. The Aschkibokahn site, located on an island at the mouths of the Duck and Drake rivers in Lake Winnipegosis (Figure 5.5), dates to about A.D. 1200, and is the only known site where Duckbay ware is predominant.

Hanna[33] has proposed that the unusual distribution of Duckbay ware results from the settlement pattern of a nonsedentary endogamous local band. It is postulated that this band used the Aschkibokahn site as a base for fishing and for hunting migratory waterfowl in spring and fall, and that they probably hunted and gathered from this site in the summer as well. During winter, the group may have dispersed inland from the exposed lake site. Hanna indicates that such a band would have numbered between 140 and 150 individuals. This is consistent with the estimated carrying capacity of the logistical hunting and gathering area surrounding the site.

Snortland-Coles[34] has emphasized the importance of plant resources in nearby wetlands, and Hanna has pointed out that a juxtaposition of environmental zones, including marsh, forest, meadow, stream, and lake, would have placed the Aschkibokahn region in a resource-independent territory, "since the proximity of interspersed biomes means that access to any and all biomes and their resources can be easily achieved from any one site."[35] Hanna also suggests that the area may have been even more productive at the close of the warmer Neo-Atlantic climatic episode, which coincided with the Duckbay occupancy.

Based on faunal analysis[36] and environmental reconstruction,[37] it appears that fish and migratory waterfowl, together with a variety of plants, were crucial subsistence resources at Aschkibokahn. These resources show marked seasonality, being available from spring through fall. Almost all the winter subsistence resources that were available through Duckbay technology were found inland from the site. The uplands to the west, and to a lesser extent the Interlake Lowlands to the east, would have contained an abundance of suitable winter subsistence resources such as moose, elk, aquatic rodents, and snowshoe hare.

The exposed location of Aschkibokahn would not have been a desirable habitation during spring breakup, when unstable ice conditions could render any offshore activity difficult or impossible. Besides the above limitations, year-round hunting would soon have depleted the localized small game and caused much of the large game to avoid the area adjacent to the village. Faunal recoveries indicate that large animals were processed at some distance from the site and were subjected to intensive marrow extraction. These large mammals likely represent fall kills made before the inhabitants moved to wintering areas inland.

The archaeological evidence for the Duckbay subsistence strategy at the Aschkibokahn site suggests a northern boreal forest pattern similar to that practised by the

Chalkyitsik Kuchin of central Alaska. Nelson[38] states that "they followed a pattern which is common to many Athapaskan groups, travelling far up to the headwaters in fall, staying in the upriver country until spring, then floating down the river and spending the summer fishing in the downriver regions."

The Duckbay adaptation appears to have been an unusually localized, or simply a hitherto archaeologically unrecognized, boreal forest adaptation. The evidence cited by Hanna[39] indicates that a particular social configuration developed among the Duckbay people that enabled them to control and exploit a relatively small but highly productive wetland niche, together with adjacent lowland and mixed-woods sections of the boreal forest. Detailed analysis of other ceramic assemblages, and possibly other classes of artifacts also, may reveal that similar patterns existed elsewhere in the forest/grassland transition areas. The origin or ultimate fate of the Duckbay people is unknown, as is their relationship to any historic groups, although a Late Woodland association is clearly indicated.

Selkirk

Selkirk wares first appeared about A.D. 1000, near the beginning of the Late Woodland period, and terminated at historic contact in the late 18th or early 19th century (Figure 5.2). Blackduck and Selkirk wares share many identical design elements, including similar vessel forms (Figure 5.4). Although they are believed to represent distinct cultural groups, they are frequently found together. Saylor[40] states: "There is firm evidence of Blackduck and Selkirk ceramic-making populations having shared the same ecological areas. Indeed, it can be hypothesized that they had nearly identical exploitive and settlement patterns in the Wanipagow Lake region. . . . Selkirk ware has to some degree developed, at least in part, from Blackduck ware."

Unlike Blackduck, the distribution of Selkirk ware is confined almost exclusively to the boreal forest (Figure 5.1), seldom extending into adjacent parklands, although it is occasionally reported from the mixed-woods uplands.[41] The uplands evidence, however, more strongly favours Blackduck and Duckbay occupation. Selkirk wares have been almost universally assigned to the prehistoric Algonquian speakers subsequently known as the Cree, based upon recoveries from an early historic site known to have been occupied by the Cree.[42] The distribution of Selkirk ceramics supports this assignment, since the Cree are not believed to have ventured onto the plains or to have been a significant presence in the parklands until after the introduction of fur trade goods, which replaced Aboriginal ceramics with copper vessels. In southern Manitoba, Selkirk ware is largely confined to the area east of the Red River.

The Selkirk Horizon has been divided into three complexes: Selkirk, Clearwater Lake Punctate, and Pehonan.

Clearwater Lake Punctate was first described by Hlady,[43] and this definition has since been confirmed and refined by Meyer.[44] In northern Manitoba, in the Kame Hills area of South Indian Lake, Dickson[45] has defined a variant of the Clearwater Lake Punctate Complex. This Kame Hills Complex is characterized by additional vessel forms such as plates and bowls, plus variation in the numbers of rows of decorative punctates.

The related Pehonan Complex[46] appears to be a transitional culture combining traditional Clearwater Lake Punctate artifacts and subsistence practices with traits from the plains areas to the south and west. The complex has been dated at the Bushfield East site, near Nipawin in northeastern Saskatchewan, to 350 ± 60 B.P. (A.D. 1600). Bushfield and other Pehonan sites are located in the forest/parkland transition of northeastern Saskatchewan, along the Saskatchewan River system, northwest of the study area.

During the fur trade era, this area supported sizable populations of forest species such as moose, bear, and beaver; edge species such as deer and elk; and wintering populations of bison. It is probable that Kelsey visited this general area in A.D. 1690. The Pehonan Complex likely persisted until European contact in the early 18th century. Meyer[47] has inferred that the distinctive hybrid Pehonan Complex may be the result of the Woodland Cree (Clearwater Lake) interacting with the plains/parkland-oriented Assiniboine (Plains side-notched projectile points). Such a scenario would be consistent with the accounts of Kelsey in 1690,[48] La Vérendrye in the 1730s,[49] and Henday in 1754,[50] which indicate fraternization between these groups.

Since almost all Selkirk/Clearwater Lake sites are found in the boreal forest, where acid soils rapidly destroy organic remains, most subsistence data are found in sites in the forest/parkland margins (Figure 5.1), such as Lockport and The Pas Reserve site, or by means of environmental reconstruction. A forest adaptation is indicated, heavily dependent upon fish and migratory waterfowl in spring through fall, and relying on moose, caribou, aquatic rodents, and snowshoe hare in winter. The evidence is largely inferential, but it is likely that plant foods, including wild rice in the southeastern areas, were important seasonal resources. Most sites are located along waterways, which facilitated travel through the forest and furnished abundant food resources during seasons of open water.

Selkirk/Clearwater Lake occupation in southern Manitoba is largely confined to the forest east of the Red River Valley. In the Riding Mountain upland, preliminary work by Jamieson[51] incorrectly assigned most of the ceramic sites located in her survey to the Selkirk horizon. A reexamination of the written descriptions (no photographs are available) indicates that Blackduck (5 vessels) and Duckbay (3 vessels) wares predominate. The description of angled and decorated shoulders on some vessels, together with mention of incising on fabric-impressed vessels, may indicate the presence of the Pehonan Complex.

Horticultural Village Ceramics

Recent field research indicates the presence of Eastern Woodland and Middle Missouri ceramics at

several sites associated with large potholes and riverine ecotones in southern Manitoba. Radiocarbon dates from occupations at the Lovstrom, Lowton, and Jackson sites (Figure 5.5) indicate a horticultural village presence about A.D. 1400–50. It is apparent that these Late Woodland villages relied on horticulture as well as bison and other traditional hunter and gatherer food resources.[52] Bison scapulae and stone hoes recovered from the Lovstrom and Johnas sites, and stone hoes noted at the Lowton site by Vickers,[53] together with large numbers of stone hoes surface-collected from sites throughout southern Manitoba, all support the horticultural hypothesis. In addition, many of the ceramic types that have been recovered through excavation or examined in local collections are known to have been accompanied by horticulture at sites further south.

The Lowton and Lovstrom sites are located within the Tiger Hills/Pembina Mountain landform (Figure 5.5), an elevated, undulating area characterized by end moraine, hummocky ground, kettle and kame topography, and small eskers. The soils are mixed gray wooded — a characteristic of a longstanding parkland environment. The environmental settings of the Johnas and Jackson sites are similar. These locations would have been well suited to production of the short-season varieties of cultigens commonly grown by the Middle Missouri Village tribes.

These sites have been designated as the Vickers Focus, a hunting/horticultural-adapted society that supported its people through hunting and gathering, accompanied by a small-scale gardening system. The ethnicity of these First Nations people is unknown, although it has been suggested that they may have been the ancestral Hidatsa.

PROTOHISTORIC/EARLY HISTORIC (A.D. 1500–1850)

The principal groups occupying the study area during the Protohistoric and Ethnographic periods were the Assiniboine, Cree, and Ojibwa. Other groups — including Sioux, Mandan, and Gros Ventre — made occasional incursions to raid or trade, and fur companies brought in Iroquois as voyageurs and hunters.[54]

Assiniboine

The Assiniboine speak a Siouxan dialect and, according to tradition, separated from the Yanktonai in northern Minnesota early in the 17th century.[55] While divisions within the Assiniboine have been noted,[56] the Assiniboine of southern Manitoba will be treated here as a single interacting tribal entity.

Before 1700, the Assiniboine were described by early French observers as possessing a southern boreal forest adaptation, where forest resources, such as fish, moose, and beaver were relied upon in spring through summer followed by a wild rice harvest in late summer and early fall.[57] In late fall, there was a move to the parklands, where bison could be hunted as they drifted into the parklands to winter pastures. In 1691 Kelsey[58] described a surround kill of bison in the parklands near the Touchwood Hills in Saskatchewan. In 1757 Smith and Waggoner,[59] two Hudson's Bay Company employees from York Factory, travelled by way of Lakes Winnipegosis and Manitoba to the Assiniboine River, and "Here in the baren grownd" [*sic*] they met the Sinipoete (Assiniboine) and saw a new method of killing the buffalo. "Ther was a pound as maed to kill the boffler in and that day wandey [Wednesday] there was 67 cam in at onese."[60]

By the early 1730s, La Vérendrye found that the Assiniboine had moved from the Rainy River and Lake of the Woods forest area into the parklands west of the Red River. In 1738 he came upon 10 tents of Cree at the forks of the Red and Assiniboine rivers who attempted to dissuade him from proceeding westward because he would be "going among people [Assiniboine] who did not know how to kill beaver and whose only clothing was buffalo skin."[61]

By about 1760 the Assiniboine had become well established in the parklands and had begun to move into the margins of the plains on a seasonal basis. Late-fall trading expeditions for corn to the Mandan villages along the Missouri were an established tradition — possibly to acquire a substitute for the wild rice that had been harvested in earlier times. Bison was the major subsistence resource, supplemented by moose, elk, beaver, and bear. Horses were scarce among the Assiniboine at this time, and were used chiefly for transporting goods rather than riding.

By the end of the 18th century, the Assiniboine were established as plains/parkland bison hunters, following the seasonal round of the herds into the plains in spring and summer, and returning to the parklands with the herds in late fall and winter. Seasonal harvest of roots, such as Indian bread root (*Psoralea esculenta*), and a variety of berries supplemented the diet, together with corn obtained from the Mandan.

When John MacDonnell arrived at Fort Esperance, near the present-day St. Lazare on the Qu'Appelle River, in 1793, he found that his major trade with the plains/parkland-adapted Assiniboine was for bison pemmican, tallow, and hides, together with the skins of prairie wolves. Forty years later, the Assiniboine were located south and west of the Qu'Appelle Valley. When Hind[62] followed the Qu'Appelle to its source and turned northward along the South Saskatchewan in 1857, he encountered only Cree and Ojibwa. By this time, the Assiniboine occupied only the southern edge of Saskatchewan into Montana and had gradually drifted southwest, abandoning the study area except for occasional use of the Souris River basin west of Turtle Mountain. The demise of the great herds after 1870 ended the bison-hunting era and led to the settlement of the Assiniboine on reservations.

Cree

In mid-17th century, Algonquian-speaking Cree lived throughout the boreal forest along the southern and eastern margins of Hudson Bay, in the basins of the Nelson and Hayes and along the lower part of the Saskatchewan River, along the

rivers draining north into James Bay, and south to Lake Nipigon and Rainy Lake, where they came into friendly contact with the Assiniboine. By 1760, the Cree had established themselves throughout the Manitoba Lowlands as far south as the forks of the Red and Assiniboine rivers, and along the northern margins of the parklands on the north side of the North Saskatchewan River. During this period, they were the principal occupants of the northern portion of the study area, the Assiniboine being a minority north of the Assiniboine River.

Cree expansion into the parklands resulted from their middleman role in the fur trade, and the subsistence strategies that they used in the parklands were an extension of seasonal patterns practised in the adjacent forest regions. Mandelbaum[63] characterizes the Cree as being ambivalent between the forest and parkland environments as late as 1790, with some groups choosing to remain within the hilly, forested uplands even though the nearby open plains had an abundance of bison.

In the first half of the 19th century, the Cree expanded into the western plains and withdrew from southern Manitoba until only the section of the Assiniboine River above the junction with the Qu'Appelle was regularly occupied. During this period the Plains Cree differentiated themselves from Woodland Cree and adopted a plains subsistence learned from the Assiniboine. In southern Manitoba, the Cree were superseded by the Ojibwa, who moved in from the east. The Woodland Cree, whose subsistence strategies had changed little since contact, were confined to the northern boreal forest; except for northwestern Saskatchewan, they were separated territorially from the Plains Cree by the entry of the Ojibwa into the area that the Plains Cree had abandoned to pursue the plains bison economy.

Ojibwa

The Ojibwa (locally also called Chippewa and Saulteaux) are an Algonquian group with a language similar to Cree. The ancestral Ojibwa first appear in the historical record along the St. Mary's River in northern Ontario in 1640. Kinietz[64] states that those north of Lake Superior lived solely by hunting, fishing, and gathering of wild foods, while those living to the south supplemented their diet of wild foods with limited horticulture based on corn and squash. Moose and beaver were the most important food animals, and the abundant fish in the St. Mary's River accounted for the presence of the Ojibwa there.

About 1720, the Ojibwa rapidly expanded westward and northward to include almost all of southern Manitoba except the area west of Turtle Mountain. During this expansion, much of the area was shared with Cree and Assiniboine, who were allies against the Sioux. By 1760 the Ojibwa had expanded into north-central Minnesota and the Lake of the Woods area, where wild rice became a fall and winter staple, and in the next 50 years they occupied most of the area east of the Manitoba Escarpment. John MacDonnell[65] referred to Saulteaux at the north end of the Portage la Prairie in 1795, Harmon[66] noted Saulteaux at Meadow Portage on Lake Winnipegosis in 1800, and Tanner indicated an Ojibwa presence between 1795 and 1820 along the Red and Assiniboine rivers.[67] By the close of the bison-hunting era on the northern plains, about 1870, the Ojibwa occupied the maximum extent of their range, including the parklands of southern Manitoba and the northern edge of the parklands in Saskatchewan to the forks of the North and South Saskatchewan rivers.

From about 1785, when the Ojibwa entered the study area as hunters and trappers, until the close of the fur trade era, they maintained a Woodland subsistence pattern. Tanner mentions the sowing of corn at Dead River (Netley Creek), north of Lockport, about 1814. The Ojibwa's pattern of subsistence after the withdrawal of the Assiniboine and Cree to the west was based upon southern boreal forest strategies, including cultivation of small amounts of corn.

In spring, families moved to rivers and lake marshes, where spawning fish and migratory waterfowl could readily be taken. In late spring, small fields of corn were planted and large ungulates were hunted: moose and elk, if the group was in a forested section of the parklands; moose and woodland caribou, if in the forest; and occasional bison stragglers in the more open areas of the parklands. In the fall, following the corn and wild rice harvests, the groups moved to forested areas, where bear and moose, together with fur bearers, particularly beaver and muskrat, made up a diet that was supplemented with stored corn. This pattern differed from that followed by the Woodland Assiniboine and the Woodland Cree, who had occupied the study area earlier, in two ways: resource exploitation was intensified, and limited sedentariness accompanied horticultural practice.

The more intense resource exploitation was necessitated by the depletion of game stocks in the wake of the fur trade, which often resulted in local starvation, forcing families to move frequently as local resources were depleted. The limited horticulture practised by the Ojibwa restricted their mobility, since it was necessary to tend their fields at certain times of the year. This further depleted local resources, making the Ojibwa more dependent on their crops in an area where corn growing was marginal.

Summary of Subsistence Strategies

At contact, the Cree and a majority of the Assiniboine used subsistence strategies geared towards the resources of the boreal forests. Various bands of Ojibwa were far to the east, utilizing the forest resources of the upper Great Lakes region. Under pressure from European settlement east of the upper Great Lakes, and motivated by the opportunities offered by the expanding fur trade, the Native groups moved westward.

Ultimately, the Assiniboine adapted to a bison economy, and were soon followed by some of the Cree, who were their allies. After the Assiniboine and Cree withdrew from the parklands, the most westerly of the Ojibwa were in the process of adapting to a plains/parklands economy

when the bison completely disappeared from the open plains, surviving only in small enclaves in isolated areas where the Canadian and American governments established game preserves. The Assiniboine, Cree, and Ojibwa all engaged in a transitional subsistence strategy leading from the forest to the plains. The extinction of the bison herds and severe depletion of most other animal resources effectively brought this strategy to an end, and at the same time halted the Natives' migration from the forest to the plains.

CONCLUSION

From the Late Prehistoric period there is clear evidence for the diffusion of people and ideas from the Eastern Woodlands into the Central and Northern Plains. This diffusion may have been a response to new environmental opportunities as the parklands expanded and bison increased in numbers following the Hypsithermal. There is also evidence for a demographic increase in the Eastern Woodlands, resulting in Middle Woodland Hopewell expansion, which initiated westward migration about A.D. 100.

In the Late Prehistoric period, a heterogeneous but interrelated configuration developed, encompassing the plains, parklands, and southern boreal forests. This configuration was characterized by small side-notched points, unnotched triangular points, and fabric-impressed ceramics, which appeared in sites occupied by successors of aceramic groups. Similarly, new lithic styles appeared in established ceramic complexes. Small unnotched triangular points also appeared in the northeastern periphery in Late Woodland assemblages, and at the end of the Late Woodland period, this diffusion of traits was followed by people from the Middle Missouri area.

Based on an examination of collections made by amateurs, archaeologists postulate that Middle Woodland hunter-gatherers entered southern Manitoba about A.D. 100 and were followed by Late Woodland groups utilizing ceramic wares, such as Blackduck, about A.D. 700–1000. Subsequently, horticultural villagers from the Eastern Woodlands were joined by immigrants from the Missouri Basin, resulting in temporary coresidence and hybrid ethnicity units. Materials excavated at the Lovstrom and Lockport sites, and data from amateur collections, indicate that horticultural production formed a part of their subsistence. By the early Protohistoric period these hybrid coresidence groups had lost their individual identities and their control of the region. The "no man's land" of the Pembina Mountains — used by a wide range of hunting and gathering groups but not permanently occupied — came into being.

In the preceding summary of Assiniboine, Cree, and Ojibwa seasonal rounds, several viable subsistence strategies consistent with the known resources of the study area were demonstrated from ethnohistoric records. The rapid shifts in subsistence strategy that characterized the early Historic period were largely the result of European intervention. The opportunities offered by the fur trade and the excesses that it encouraged led to drastic changes in the ecology and population dynamics of species throughout North America.

Ultimately, the depletion of animal resources and the introduction of new technology and beverage alcohol led to major social dislocation and upheaval within Native society. A rapid shift in Native adaptive strategies was initiated in order to cope with them, but the resulting dislocation led to the disintegration and near-collapse of Native social order, culminating in the reserve system fixed by treaty with the Canadian government. It is unlikely that any such rapid, widespread, and disruptive series of related events occurred in prehistory; indeed, the archaeological record documents much more gradual change, characterized by a pattern of cultural stability and continuity, during the Prehistoric period.

NOTES

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GLOSSARY

Adena — An early effigy-mound building culture centred in the Eastern Woodlands between 2800 B.P. and 2000 B.P.

Anthrosol — A soil layer showing evidence of modification due to human activity; it may or may not contain artifacts.

Archaic — In the New World, a period when hunters and gatherers exploited a broad spectrum of resources and, in some regions, may have experimented with agriculture.

Artifact — Any object manufactured or modified by human beings.

Atlatl — A spear thrower. It functions like an extension of the arm, providing added thrusting leverage.

Attribute — A well-defined feature of an artifact that cannot be further subdivided. Types of attributes include form, style, and technology.

Biome — Major biotic landscapes in which distinctive plant and animal communities live in ecological harmony.

Complex — A widespread chronological subdivision of different artifact types, such as stone tools or pottery.

Component — An association of all the artifacts from a single occupation of an archaeological site.

Cultural configuration — A patterned way of life that reflects the ideology, technology, subsistence strategy, social order, and historic cultural affiliations of a regional population.

Ecotone — A steep or rapid transition zone between two larger ecological divisions, frequently characterized by species common to the larger zones. It may also include species unique to the transition zone.

Endogamy — The rule specifying marriage to a person from within one's own group (caste, kin, community).

Exogamy — The rule specifying marriage to a person from outside one's own group (caste, kin, community).

Focus — An archaeological unit composed of several identified components, circumscribed in time and space, possibly at the level of a macroband.

Hopewell — An Eastern Woodlands mound-building culture centred in the Ohio Valley and in Illinois between 2100 B.P. and 1400 B.P. Noted for its extensive trade networks and burial-mound mortuary complex.

Horizon — A widely distributed set of cultural traits and artifact assemblages whose distribution and chronology suggest that they spread rapidly. May include several ethnic units linked by common technologies and interacting ways of life.

Late Woodland — The time period from about A.D. 400 to 1000 in the American Midwest; if the entire Mississippian period is included, it lasts until about 1650.

Laurel culture — A Middle Woodland hunting and gathering society that built small conical burial mounds and manufactured coiled conoidal pottery. Found in northern Ontario, Manitoba, Saskatchewan, Minnesota, Wisconsin, and Michigan.

Lithic — Rock. Usually used in reference to material used in the manufacture of stone tools. Lithic raw materials are usually isotropic, yielding a conchoidal fracture (e.g., flint, chert, quartzite, etc.).

Macroband — A seasonal or situational gathering of extended families.

Middle Woodland — The time period during which the Hopewell culture flourished throughout the American Midwest, from roughly 50 B.C. to A.D. 400.

Mississippian — A series of agriculturally supported complex chiefdoms centred in the Eastern Woodlands beginning about A.D. 700 and lasting until 1650. Major centres are characterized by shell-tempered ceramics, platform temple mounds, and defensive earthworks.

Oneota — A mid-Mississippian horticultural village complex occupying much of upper Michigan, Wisconsin, Minnesota, and northern Iowa, with extensions into the northwestern plains.

Phase — An archaeological unit defined by characteristic groupings of cultural traits that can be identified precisely in time and space. It lasts for a relatively short time and is found at one or more sites in a locality or region. Its cultural traits are clear enough to distinguish it from other phases. May be composed of two or more *foci,* possibly representing a tribal level of organization.

Selkirk Complex — A Late Woodland hunting and gathering society that manufactured fabric-impressed globular pottery. Found in northern Ontario, Manitoba, Saskatchewan, and Minnesota. Thought to be Cree.

Type — A class of archaeological artifacts defined by a consistent clustering of attributes.

Case Study 5.1
Prehistoric Farmers
in Southern Manitoba
B.A. Nicholson

Typically, Manitobans think of the Red River Settlement as the first farming community in the province. However, recent archaeological field research in southern Manitoba has identified sites where late precontact villages relied on horticulture as well as on bison and other traditional food sources. Bison scapulae and stone hoes recovered from the Lovstrom and Johnas sites (Figure 5.5 on page 69), and stone hoes at the Lowton site, together with large numbers of stone hoes surface-collected throughout southern Manitoba, all support this theory. In addition, many of the ceramic types that have been recovered through excavation or examined in local collections are known to have been accompanied by horticulture at sites further south.

The horticultural sites are all located close to ponds on warm, easily worked, light-textured, parkland soils. From the perspectives of soil, climate suitability, and potential for irrigation using pots, their locations would have been conducive to production of the short-season crop varieties commonly grown by Middle Missouri Village tribes. Flint corns grown by Middle Missouri and other Northern Plains village tribes matured in 60–90 days — well within the frost-free period for most of southern Manitoba (Chapter 3). Since Middle Missouri pottery has been found in these horticultural sites, it can be assumed that the appropriate crop varieties and horticultural lore would have been known to the occupants. The radiocarbon dates from the Vickers Focus horticultural occupation at the Lovstrom site, which overlooks the Souris River valley, the Jackson site near Lauder, and the Lowton site near Belmont cluster in the period A.D. 1400–50, and an earlier Initial Middle Missouri site dating to A.D. 1000 has recently been found near the Jackson site.

In assessing the likelihood of a horticultural presence in the parklands of southern Manitoba, two sites on the Red River provide additional evidence for northward expansion of horticultural village groups towards the end of the late precontact period. The Lockport site, located north of the city of Winnipeg on the west-facing slope of the Red River channel, has been extensively dug by the Manitoba Historic Resources Branch. The radiocarbon dates from the horticultural phase at this site overlap the horticultural occupation at the Lovstrom site. Similarly, work at The Forks of the Red and Assiniboine rivers (Case Study 10.1 on page 150) conducted during the summer of 1988 by Parks Canada identified a buried structureless prehistoric anthrosol[1] consistent with horticultural activity. The evidence for corn growing at the Lockport site is conclusive: storage pits containing scapula hoes and remains of corn. Moreover, the presence of storage pits containing corn indicates production of a storable surplus.

In collections from horticultural village sites south of the Pembina Trench and east of Killarney, most of the ceramics appear to be typologically close to Late Woodland wares commonly found southeast of the Red River Valley. West of this area, ceramics found in collections are typologically more closely associated with the Middle Missouri Village traditions and Mortlach ware common to southern Saskatchewan. Essentially, this division approximates the plains-parkland transition zone, with the Woodland sites being found primarily in pothole-dotted terrain and the plains-oriented sites more commonly associated with stream valleys.[2]

The ceramics from the Lowton, Lovstrom, Johnas, and Jackson sites have been subsumed under the term "Vickers Focus" and form a part of the Scattered Village Complex.[3] All four sites contain unique finger-pinched wares. Many ceramic vessels in these assemblages resemble Mississippian wares, but some of the ceramics are typologically more closely related to wares from the Scattered Village Complex and the Missouri Village traditions.[4] The evidence suggests that these four sites represent a unique aggregation of people of diverse origins who had similar subsistence practices and were organized by similar social institutions.

An ethnographic analogue can be found in the Cree-Assiniboine Young Dog Band, where two linguistically unrelated groups intermarried and achieved a hybrid ethnicity different from that of both parent groups. The ceramic evidence for the Vickers Focus suggests a pattern of polyethnic coresidence or fused ethnicity similar to that of the Young Dog Band. Polyethnic coresidence was a common feature of Plains Indian life, and coresidence frequently crossed linguistic boundaries and even, on occasion, the lines of traditional enmity.[5] The ethnic identity of the Vickers Focus people is unknown, but many of the ceramics indicate cultural affiliations with late precontact populations living in northern Minnesota and North and South Dakota.

Pettipas[6] has recently suggested that the Vickers Focus people may have been ancestral Hidatsa. In support of this idea, it is noted in passing that in 1738 La Vérendrye's Ojibwa informants stated that southern Manitoba was formerly occupied by the Hidatsa.[7] It may be that the horticultural villages in southern Manitoba were either assimilated into the Hidatsa way of life or were forced out of the region by the Hidatsa influx.

Similarly, Lowie notes that "Before 1800 the Arapaho, Gros Ventres, Crow, and Cheyenne, traditionally horticultural tribes, had become nomadic hunters . . . [and] it appears most probable that they did not relinquish horticultural practices until they became aware of the advantages of hunting buffalo on horseback."[8] It may be that the horticultural villagers of southern Manitoba were among the ancestors of these groups, or that some of them drifted southward to merge with the earth-lodge cultures of the Protohistoric Middle Missouri traditions. Whatever the "First Nations" ethnicity of these first farmers in Manitoba may have been, it is clear that the farming way of life was here long before the first European homesteaders arrived.

NOTES

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5. S.R. Sharrock, "Crees, Cree-Assiniboines, and Assiniboines: Interethnic Social Organization on the Far Northern Plains," *Ethnohistory* 21, 2(1974):95–122.
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THE HISTORICAL DEVELOPMENT OF THE CULTURAL LANDSCAPE OF MANITOBA TO 1870

6

Barry Kaye

In 1870, three years after Confederation, Rupert's Land and the Indian Territories were transferred from the Hudson's Bay Company to the Dominion of Canada. Rupert's Land included all lands draining into Hudson Bay, and was the area within which, in 1670, the British-based fur-trading company, the Hudson's Bay Company, was granted a monopoly. Out of the area ceded to Canada on 15 July, an area approximately 100 miles square (259 km^2) was organized into the new province of Manitoba, the first province west of Ontario.

For two centuries the lands that came to comprise Manitoba after 1870 were part of the Canadian Northwest, a vast northern region lying to the north and west of Lake Superior in which the fur trade was the overwhelmingly dominant economic activity. The interaction between Europeans and Natives in the prosecution of the fur trade transformed traditional Native economies and ways of life. The contact between whites and Natives in these northern lands also had major demographic and social consequences, leading, for example, to the emergence of peoples of mixed Native and European ancestry, the mixed-bloods (the Métis) of the Canadian Northwest.

The fur trade, however, did not transform the landscape to the same degree. As the fur trade and agriculture were generally considered incompatible economic enterprises, the various fur-trading companies active in the Northwest were largely hostile to the extension of agricultural settlement into the wilderness areas that were the source of their wealth, and were unwilling to support the movement of immigrants into these areas. Thus, European impact on the landscape of the Northwest before 1870 was minimal, localized, and in many instances ephemeral.

European modification of the landscape was most obvious and widespread within the parishes that comprised the Red River Settlement on the banks of the lower Red and Assiniboine rivers. In 1870 the Red River Settlement was the only settlement colony in the Northwest; with a population over 12,000, it had by far the greatest concentration of people between southern Ontario and the Pacific coast. Beyond the confines of the colony was what W.F. Butler in 1872 called "The Great Lone Land," an apt description of this part of Canada at the time Manitoba was formed.[1] Within its vast expanse, European activity centred on trading posts and Christian mission stations.

TRADING POSTS

Trading posts were the most important and characteristic expression of the fur trade economy in the landscape. They were centres of the hunting and gathering hinterlands from which the Natives brought pelts and, increasingly in the prairie-parklands region, the varied products of the buffalo hunt, known as "plains" or "country" provisions, the most important of which was pemmican. The trading posts were also distribution centres for European trade goods. The Natives were the key element in all these exchanges, so the traders generally tried to locate their posts at the

seasonal assembly points of the bands.

In the interior, most posts had river-oriented or lakeside locations. The water courses were the main lines of movement and transportation and a valuable source of fish, and the woods on the banks provided timber for fuel and construction. The posts clustered especially at the junctions of the main rivers, at the Pembina with the Red, the Souris with the Assiniboine, and the Qu'Appelle with the Assiniboine. In 1810 the North West Company built Fort Gibraltar at The Forks, or the junction of the Red and the Assiniboine, the site of the future city of Winnipeg (Figure 6.1).

After the western posts of the French were abandoned when the British conquered New France in 1760, Canadian traders from the St. Lawrence were the pioneer traders in most of the Northwest. After the early 1790s, however, they were matched post for post by Hudson's Bay Company traders moving inland from York Factory and Fort Albany on Hudson Bay. Two, three, or even more posts were often clustered in one location as rival traders jostled for supremacy. Many were transient, impermanent structures that were abandoned or moved and rebuilt for a variety of reasons — the superior location of a nearby rival, the changing habits of the local Natives, or the decline of a vital resource (timber, game, or fur-bearing animals) — and by the end of the 18th century, their ruins were mute testimony to earlier fur-trading activities.

The posts continued to proliferate until the union of the Hudson's Bay Company and the North West Company in 1821. Soon after, many posts were closed by the reorganized Hudson's Bay Company for economic reasons, creating a much more stable pattern of post distribution than during the previous half century of fur trade competition and settlement. However, this stability was upset to some extent towards the end of the fur trade period by a free-trade movement that emanated largely from the Red River Settlement and, to a lesser degree, from mission settlements throughout most parts of the North-

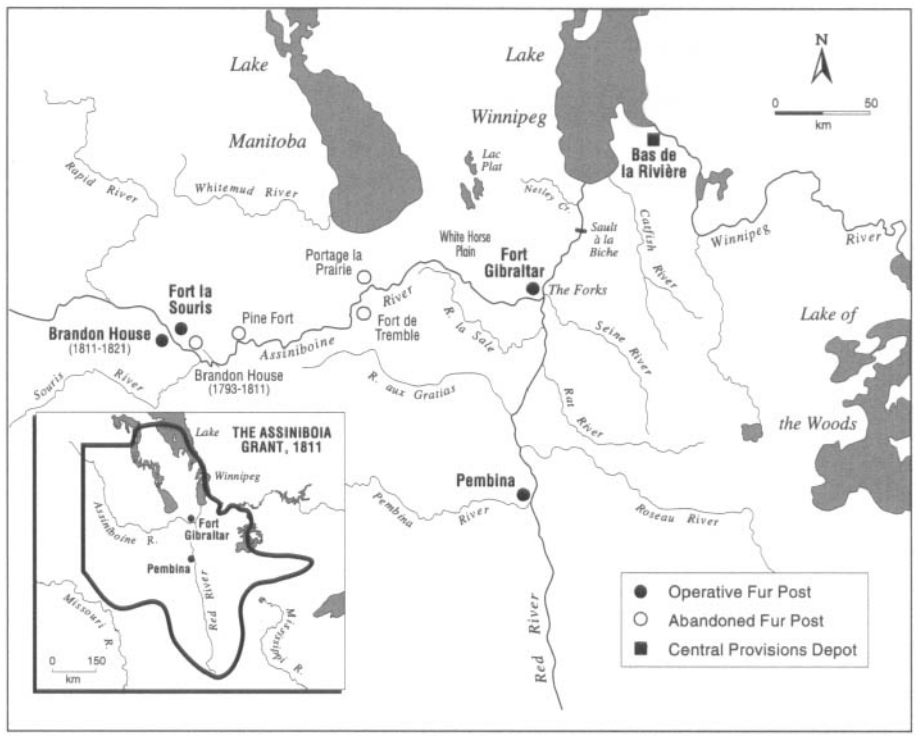

Figure 6.1 Red River Country at the Time of the Founding of the Red River Settlement

west. In an attempt to neutralize the effects of the free-traders, Hudson's Bay Company posts proliferated in the period 1850–70, especially in the Lac la Pluie (Rainy Lake) and Swan River Districts, the two districts flanking the free-trade haven of the Red River Settlement.

There were considerable differences in the sizes and economic functions of the posts. The smaller posts were simple structures consisting of a few log buildings (a dwelling, a trading house, and a warehouse), usually constructed around three sides of a rectangle, the whole enclosed by a stockade. The larger and more durable establishments — the district headquarters such as Norway House, the Bayside factories such as York Factory, and Cumberland House, which is now just in Saskatchewan — were more substantial structures, with more support facilities for fur trade operations (Figure 6.2). Besides larger-scale entrepôt functions, in their capacities as central places or maritime ports these larger settlements were often centres for boat building, blacksmithing, coopering, tailoring, and occasionally religious instruction and medical services.

Gardening was also a significant supporting enterprise of the fur trade, and its products played an integral, if small, part in provisioning the trading posts. The first gardening experiments in the Northwest began shortly after the first permanent European settlements were established on the shores of Hudson Bay in the 1670s. During the next century gardening remained confined to the arctic and subarctic settlements of the Hudson's Bay Company on the shores of Hudson Bay, but in the 50 years of intense fur trade competition after 1774, it spread through most parts of the interior Northwest, with fur traders introducing the first domestic plants and animals to most of the region.

By the time of the union of 1821, almost all year-round posts, whether British or Canadian, combined trading and gardening activities. Although agricultural activities were well developed at a few posts, at most posts they amounted to no more than small-scale gardening devoted to the production of a few vegetables and greens. The traders produced part of their rations from gardening, but the posts never achieved agricultural self-sufficiency and continued to depend upon agricultural foodstuffs from

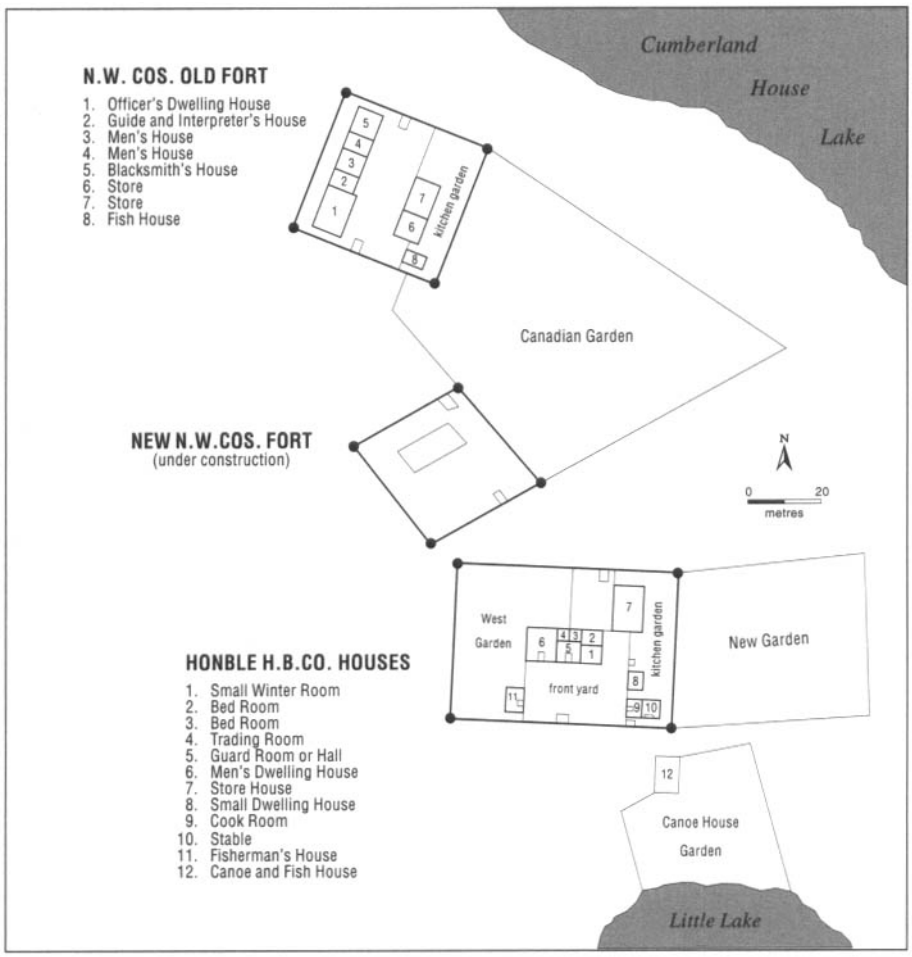

Figure 6.2 Plan of Cumberland House in 1815 (Source: Hudson's Bay Company Archives, G1/96)

Britain, Canada, and, after about 1830, from the Red River Settlement.

MISSION STATIONS

Another distinctive characteristic of the European presence during the fur-trade era was the mission settlement. The extension of the Christian church as a "civilizing" or metropolitan influence into the fur trade wilderness of the Canadian Northwest began in 1818 with the establishment of the first Roman Catholic mission, followed shortly by the first Church of England mission in 1822. Both were located in the Red River Valley shortly after the founding of the Red River Settlement, and together the founding of missions and the establishment of an agricultural colony marked the beginning of a new era in the Northwest. Many other missions were subsequently established at Red River, each eventually forming a parish, so the Red River Settlement was in effect a conglomeration of missions.

Beyond the confines of the Red River Settlement, many other Anglican, Roman Catholic, Methodist, and Presbyterian missions were set up, especially after 1840. These missionary endeavours were essentially an attempt to convert nomadic Native and mixed-blood peoples to Christianity and to a more sedentary way of life, although they also served a needed function for the European personnel at the fur-trading posts. For this reason, as well as a persistent shortage of manpower, most missionary activity was itinerant and focused on movement to sites of seasonal gathering of Natives and Métis, mainly major fishing sites, portages, and fur-trading posts. For example, Grand Rapids at the mouth of the Saskatchewan River was regularly visited by Anglican missionaries from The Pas because a large part of their flock assembled there for the annual sturgeon fishing (Case Study 18.1 on page 281).

Most mission settlements included living quarters and often a chapel and a school. They almost always had some horticulture, and resident Native and mixed-blood populations that could number several hundred. The most populous missions in the Northwest were in the Fort Edmonton area, but those at Rossville northeast of Norway House, The Pas, Fairford, and Duck Bay in Manitoba were also early centres of population.

Some missions were located at or near a fur-trading post (such as the Church of England mission of St. John's at York Factory and the Rossville Methodist mission), whereas others were established totally independent of a post (such as the Church of England mission of Fairford in Manitoba's Interlake region). The missions were also precursors to the establishment of Native reserves in many parts of the Northwest, and, as self-supporting settlements with small populations, many became centres of the free-trade movement that eventually broke the monopoly of the Hudson's Bay Company. They were also used by the Company to control population movement and labour supply, and became magnets for Hudson's Bay Company posts, especially in the 1850s and 1860s.

THE RED RIVER SETTLEMENT

In 1870 the impact of European activity in Manitoba was most widespread and persistent along the banks of the lower Red and lower Assiniboine rivers, within the parishes that comprised the Red River Settlement. Within the narrow riverine belts, a new European landscape made up of fields, settlements, trails, mills, and trading posts had been created since the beginning of colonization in 1812.

The founder of the colony was the Scottish nobleman Thomas Douglas (1771–1820), the fifth Earl of Selkirk. In 1811 the Hudson's Bay Company granted to Selkirk, for purposes of agricultural settlement, a large area of land known as

Assiniboia (Figure 6.1), consisting of 116,000 square miles (300,439 km^2) of Rupert's Land and focused on the Red River Valley. This culminated a decade of effort by Selkirk to gain permission to establish an agricultural settlement in interior British North America.

Selkirk's main intention in establishing a colony at Red River was to provide a new home on British territory for poor, dispossessed Scottish and Irish peasants, thereby reducing both social stresses in Britain and the flow of emigrants to the United States. His plan became a reality only with the cooperation of the Hudson's Bay Company. The Company judged that an agricultural colony on its chartered lands might serve as a reliable and convenient source of agricultural foodstuffs and labour for its growing number of fur-trading posts. Such a settlement, the Company hoped, would permit significant reductions in imported English provisions needed to supplement the local food supplies of its overseas settlements, thereby increasing its competitiveness in its struggle with the North West Company for supremacy in the fur trade.

The people who settled at Selkirk's colony after 1812 were extremely varied, representing a number of nationalities, languages, and religions. Between the beginning of settlement in 1812 and the union of the Hudson's Bay and North West companies in 1821, there were two main groups of colonists: immigrants from overseas and those who moved to Red River from other parts of British North America.

The immigrants can be divided into those from Britain, mainly Highland Scots but also a few Irish, and those from Continental Europe, the De Meurons and the Swiss. Among the internal migrants were French Canadians from Lower Canada (about 50 arrived in 1818), Canadian freemen (former employees of Canadian fur-trading companies), Métis, and, especially after 1821, retirees from service in the fur trade.

Between 1812 and 1815, about 300 settlers came to Red River from Britain. Many were from the parish of Kildonan in the County of Sutherland in Northern Scotland. The number of British settlers was sharply reduced by migration to Canada after the colonists were harassed in 1815 and 1816 by the North West Company and their Métis allies. Most of those who stayed settled on the west bank of the Red, north of The Forks.

The Continental European immigrants arrived between 1817 and 1821. The De Meurons were disbanded mercenaries who had fought in the War of 1812. They included German-speaking Swiss, Germans, Poles, French, and Italians, and were given land on the east side of the Red across from The Forks between the Red and the Seine rivers. Closely associated with the De Meurons and quickly attached by marital ties were the 170 Swiss colonists who arrived in 1821, the largest and last immigrant party to come to Red River. The De Meurons and Swiss were dissatisfied and inappropriate colonists, and almost all left Red River between 1822 and 1827, many after the great flood of 1826 (Case Study 18.2 on page 283).

Immigration was of little importance after 1821. Not until 1874 and the migration of Mennonites to the new province of Manitoba was there any further large-scale immigration directly from Europe. After 1821 the only immigrants were the 13 families from Lincolnshire in eastern England engaged as servants for the Hudson's Bay Company's experimental farm in 1837, and the two parties of British pensioners who arrived in 1848 and 1850.

From the early 1820s onward the colony's population growth, apart from natural increase, resulted mainly from intracontinental migration. This migration was at first largely a consequence of the union of the Hudson's Bay and North West companies in 1821, for the union brought people as well as peace to the colony. The reorganization and rationalization of the Northwest fur trade after the union led to the closure, or reduction in the manpower, of many trading posts, whose employees became superfluous and were released from their positions. Some sought permanent residence at the Red River Settlement. Many peoples were involved in this migration, including English, French Canadians, Métis, Orkneymen, and English-speaking mixed-bloods. Families of discharged fur traders continued to take up land beside the Red or the Assiniboine until 1870, anxious to expose their children to the benefits of school and church.

The virtual absence of immigration after 1821, combined with the almost annual departure of colonists of European origin, turned the Red River Settlement into a largely mixed-blood community. By 1870, the year of the first Manitoba census, over 80 percent of the population of over 12,000 was of mixed Native and European ancestry. The French-speaking mixed-bloods, most of whom were Roman Catholic, numbered 5,754 (48.1 percent). The mostly Protestant English-speaking mixed-bloods numbered 4,083 (40.8 percent). Only 1,565 were classified as "white" or European. Most of the more than 500 Natives lived in the Protestant Native mission of St. Peter, at the northern end of the colony.

In 1870 most of the relative newcomers at Red River were people from Ontario and the United States. The Canadian newspapermen and traders who arrived in 1859–60 were joined after 1862, and especially after 1867, by a few Ontario farmers. Most of the 178 Ontario-born people in Manitoba in 1870 lived at Portage la Prairie and in the emerging village of Winnipeg. Many of the 166 Americans in 1870 were retail traders and merchants from Minnesota who since the mid-1850s had taken advantage of the growing commercial links between the Red River Settlement and St. Paul, Minnesota.

Much of the distinctive character of the riparian Red River Settlement resulted from the different peoples and cultures found in it; Europeans, mixed-bloods, and Natives, farmers and hunter-fishermen, occupied different sections of the colony. Two very different ways of life — one based largely on agriculture, the other on the buffalo hunt and the fur trade — made up a large part of the economic life of the small community.

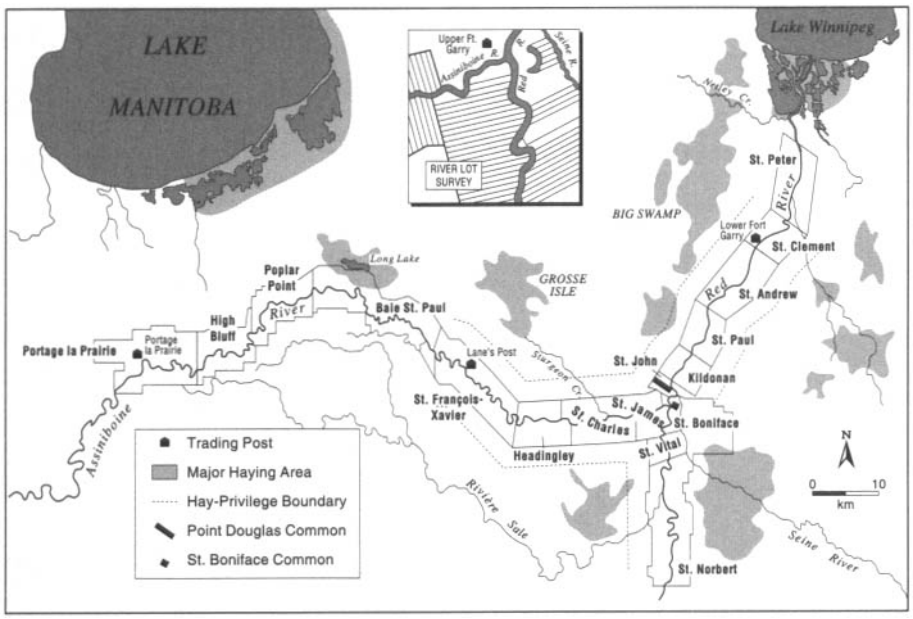

Figure 6.3 Hay Lands of the Red and Assiniboine Valleys about 1870

The repeated crop failures of the early years forced all settlers to turn to the buffalo hunt of the plains and the fisheries of lake and stream for a large part of their food supply. Out of necessity, the colony linked itself to the nomadic economy of the fur trade, a link it was never able to sever. The uncertainty of both agriculture and the hunt first created and later maintained the basic dichotomy of the Red River economy.

Agriculture and the hunt existed in close interdependence, for when the crops of the Scottish Highlanders, British mixed-bloods, and French Canadians of the Lower Settlement (St. John, St. Paul, and St. Andrew) failed, the spoils of the hunt, provided largely by the Métis of the Upper Settlement (St. Boniface, St. Vital, and St. Norbert) and St. François Xavier, had to meet most of the colony's dietary needs (Figure 6.3). On the other hand, when the buffalo hunt failed because the herds were distant or the Sioux troublesome, the farmers had to help the needy hunters, whose agrarian interest rarely went beyond a garden plot.

When both the crops and the hunt failed, as in 1836, 1840, 1844, 1855, and 1868, distress and hunger were suffered by all elements of the population. Only when both the farmer and the hunter were successful, as in 1834, 1835, 1841, 1849, and 1853, was there general well-being and abundance.

The Landscape of the Red River Settlement

The cultural landscape that evolved along the Red and Assiniboine rivers before 1870 was largely determined by the land survey system used to divide the land into farms during the initial stage of land occupancy, in 1812–13. The system was the long-lot survey of the St. Lawrence lowlands in Lower Canada (Quebec), which was probably introduced into that region during the 1630s by settlers from Normandy who had lived in wood villages (*waldhufendorf*) before migrating to North America. It was later employed by the French in Louisiana and in areas of early French settlement in the American Midwest such as Detroit, Prairie du Chien, Vincennes, and Kaskaskia. The system was introduced into the Red River Valley of the north in 1813, and was the only method of survey there until the creation of the new province of Manitoba in 1870. Thus the landscape of the Red River Settlement was characteristically North American French, consisting of long narrow lots fronting on a river.

The link between the Red River area and the St. Lawrence region was Miles Macdonell, the colony's first governor. Macdonell had lived at Cornwall, on the north shore of the St. Lawrence upstream from Montreal, and his correspondence with Lord Selkirk makes clear his familiarity with the rural land survey system of the St. Lawrence Valley. However, Macdonell thought the lots along the lower St. Lawrence were too narrow, and so for the sake of "convenience," those at Red River were to be one-third wider. Most were laid out at right angles to the river with a 250-yard (229 m) frontage. Initially the depth of lots was not fixed, but eventually it was generally accepted that the lots would be two miles (3.2 km) long.

The first lots surveyed were on the west side of The Forks, north of Point Douglas. As the population increased, similar lots were laid out along other sections of the Red and later along the Assiniboine River. By 1870 river lots extended along the Red from about 11 miles (17.7 km) south of The Forks to north of Selkirk. Long strip lots also lined the Assiniboine as far west as Portage la Prairie. Those along the Red were oriented east-west and those on the Assiniboine north-south, but sharp bends in the rivers and the crowding of the lots in the area around The Forks produced variations in both the length and orientation of the lots (Figure 6.3). The results of this survey are still very evident today along the Red and Assiniboine rivers north, south, and west of Winnipeg, in sharp contrast to the square townships and sections of the surrounding rectangular survey employed in Manitoba after 1870 (Figure 6.4).

The river-lot system was the only method of land division used before 1870, but on one occasion in 1816, when the settlers were in conflict with the Métis and the North West Company, Selkirk put forward an alternative system. He suggested that farm villages be established along the Red River, if only temporarily, to render the settlers less vulnerable to attack from their opponents. Selkirk drew up plans for such villages, but they were never laid out on the ground.

The river-lot system initiated by Macdonell in 1813 became the foundation of settlement in the Red River

Country before 1870. It triumphed over the social insecurity of the colony's early years and Selkirk's occasional uncertainty over its suitability for a wilderness colony sometimes threatened by violent opposition from the North West Company.

The survey pattern exerted strong control over settlement at Red River, but control generally in harmony with the physical environment. It provided settlers with the most advantageous use of land and water resources. Since every farm had river frontage, each family was able to locate its residence on the better-drained and sheltered levee crest with immediate access in most cases to fuel and to building and fencing materials from the riverside woodlands. The river-lot pattern also assured settlers maximum access to the Red and Assiniboine rivers — the main arteries of travel, the most readily available sources of water, and valuable sources of fish.

After 1818 the colony became the centre of both Church of England and Roman Catholic missionary activity in the Northwest. With the missionaries came the church and the river-front parish, a basic unit of social and educational activity in the colony; eventually 20 of them stretched outward from The Forks along the Red and the Assiniboine.

The Catholic population was concentrated south of The Forks in the Upper Settlement (St. Boniface, St. Vital, St. Norbert, and Ste. Agathe) and along the Assiniboine in St. Charles, St. François Xavier, and Baie St. Paul (Figure 6.3). The rest of the colony was Protestant, including a concentration of Presbyterians in Kildonan, the home of the original Scottish Highland settlers. All of the Lower Settlement was Protestant, comprising the parishes of St. John, St. Paul, St. Andrew, St. Clement, and St. Peter (the Native mission). Along the Assiniboine, St. James, Headingley, Poplar Point, High Bluff, and Portage la Prairie were also predominantly Protestant parishes.

Before 1850, new households were largely accommodated in the longer-settled areas. The increase in population led to the eventual

Figure 6.4 The Assiniboine River at St. François Xavier. The photograph shows the junction of the older long-lot land division system, along the river, and the Dominion Lands Survey system of square sections further away. The Trans-Canada Highway traverses the area in the south at the bottom of the photograph. (Photograph: MAPL MB 89021-6-153)

subdivision of many of the original long lots. Farms were split up to provide for children, and holdings were often divided two or three times. This situation was observed in the Scottish sector of the colony by Alexander Ross, who commented: "The country not being suitable for back or second concessions of lands, as the young marry, the lots become divided; and there are now, not only one establishment, but sometimes two, and even three on the same lot, giving them a ribbon-like appearance."[2]

The partitioning of the original holdings was partly a result of the desire to ensure each farmer frontage on the river and access to water, but also because of the wish of families or friends to stay close together. It was normal, especially at haying and harvest time, to find neighbours cooperating in the work. They were drawn together by the need to complete farming tasks before the advent of early frosts or autumn rains and fires. Because farm labour at Red River was scarce and expensive, it was advantageous for a settler to have sons of working age living on adjoining lots to help him complete the mowing and reaping.

The fragmentation of farms lessened the distance between homes and reduced the size of Red River farms. By the 1850s many lots were long, narrow strips with great differences between their breadths and lengths. It was this feature that

prompted incoming settlers from Ontario to say that the Red River colonists were "farming on lanes or 'streets'." By 1870 repeated subdivision of land among coinheritors had reduced many lots to comic proportions and made them difficult to farm efficiently. In part of St. Andrew's parish, three families lived on one piece of river frontage only three chains (60 m) wide.

Most of the cultivated land in Manitoba during the fur trade era was located on the river lots of the Red River Settlement. By 1831 over 2,000 acres (809 ha) had been cleared and put to the plough. The arable acreage roughly doubled between 1831 and 1841, and doubled again by 1856, when there were 8,371 tilled acres (3,388 ha) in the settlement.

Like the population, the arable land straggled for miles along the edge of the rivers, but there was no great depth of cultivation. By the 1830s there was an arable fringe of perhaps a quarter- to a half-mile (0.4–0.8 km) in depth, which may have been pushed back to about a mile (1.6 km) in some parts of the Lower Settlement by the mid-1840s. Cultivation was confined to the relatively warm and better-drained soils of the natural river levees.

The riparian nature of early Red River agriculture was recognized by John Palliser, who wrote: "Of the prairies along the Red River only narrow strips have been yet brought under cultivation by the colonists, as there the land is naturally rather higher and better drained than that lying in the rear."[3] Almost all the cultivated land was hemmed into the narrow strip between the main rivers and the dirt roads that paralleled them. Even within the settlement belt, much of the land remained unimproved — wet or dry prairie beyond the ploughed fringe or, along much of the river front, timbered land of varying density and composition.

There were, however, some internal variations in this basic pattern. The arable fringe was more continuous and deeper in the Lower Settlement, especially on the west side of the Red River between Upper and Lower Fort Garry. At the other extreme, in the Métis areas of St. François Xavier and St. Norbert, the small cleared patches were separated by long wooded stretches, giving passing travellers the impression of a colony thinly peopled and in a primitive state.

The 1856 census clearly brings out these contrasts. Whereas there were 2.4 acres (0.97 ha) of arable land per person in the parish of St. Paul and 2.0 acres (0.8 ha) in both St. John and St. Boniface, there were only 0.8 acres (0.32 ha) in St. Norbert and a mere 0.5 acres (0.2 ha) per person in St. Peter's and St. François Xavier. The arable land was heavily concentrated in the longest-settled parishes of St. Paul, St. John, and St. Boniface, where the Scots especially and some British mixed-blood and French Canadian families conscientiously tilled their land year after year.

Within the river lots, the tilled areas were fenced to keep out the livestock, in what were known among the English-speaking settlers as parks. The colonists distinguished between home parks and out or outer parks according to their location relative to the farmstead. Most of the fenced areas contained arable land, but there are also references to hay parks. Individual enclosed areas were small, perhaps three to five acres (1.2–2.0 ha).

The parish survey maps of the 1870s show that most of the arable land in the Red River area was still concentrated in the areas adjoining the main river. At the same time surveys were made of the outer two miles (3.2 km), or "hay privilege," beyond the rear boundaries of the parishes (Figure 6.3). These reveal a shift in land use and a spread of the arable land beyond its traditional margins. In parts of the outer two miles, there were "park lots" or "park claims," irregular islands of cultivation that varied from small plots of one or two acres (0.4–0.8 ha) up to blocks of 80 acres (32 ha), though most were between two and eight acres (0.8–3.2 ha). The park claims were largely concentrated in the hay privilege of St. Andrew and St. Clement to the west of the lower Red, with small numbers in Kildonan and St. James. Some of these claims may have been fenced-in hay areas used for the summer pasturing of livestock, but most were patches of cultivated ground scattered throughout the hay privilege.

The reason for their development is unclear. The scanty evidence suggests that the oldest park lots were established in the late 1850s somewhere in the Lower Settlement to the west of the Red. The appearance of park lots was probably a consequence of the continuing population increase in the longer-settled, more thickly inhabited areas of the Lower Settlement. The recurrent subdivision of river lots had led to an extreme fragmentation of farm holdings and greatly increased the pressure of population on waterfront land. It also reduced the amount of better-drained levee soil within the lots of individual families, further pushing back the cultivated strip paralleling the river. At some point the plough was taken out beyond the river lots and used to break up some of the better-drained areas in the hay privilege.

While most of the occupied land within the "settlement belt" was held in severalty, two areas in the colony, both close to The Forks, were held in common, and to these a number of settlers had equal rights. The two areas were the Point Douglas and St. Boniface Commons or Reserves. This right, probably first granted by Lord Selkirk in 1817 and later confirmed by the Council of Assiniboia, was given to residents with small holdings on Point Douglas and in St. Boniface on the narrow neck of land at the junction of the Seine and the Red (Figure 6.3).

Access to grazing and haying land was difficult for settlers in both areas, so they were allowed to graze their animals and cut hay on the common, which represented the pastoral centre for the grazing of the commonable animals. The commons may also have functioned to some extent as market and social centres. In many ways they resembled the village greens characteristic of some western European villages or, in Canada, the commons that were established during the 17th and 18th centuries by French settlers along the lower St. Lawrence River.

By the late 1820s a mixed cropping-herding agriculture had emerged, in which livestock as well as crops played an important role. All farms were unspecialized, and most of what they produced was for domestic use. Agriculture at Red River was limited by a number of factors, including the restricted market the farmers were able to serve. Repeated efforts to find an export staple failed, largely because of the settlement's isolation and its poor transportation links with potential markets.

From a commercial viewpoint, Red River agriculture before 1870 played a significant role in feeding the fur trade but made a minor contribution to the exports of the settlement. The market for farm produce was internal and largely centred on the limited but regular demands of the Hudson's Bay Company. After subtracting the seed corn and provisions for the local population, the fur trade was fed from the combined surplus of all the farms.

The short growing season reduced the range of crops that could be safely grown. The ploughed areas within the river lots were largely planted with wheat, barley, and potatoes, but smaller quantities of oats and peas were also grown as field crops. Many settlers also set aside a kitchen garden, in which they cultivated a wide selection of common European vegetables. Some of the staple crops of the sedentary village Indians of the Upper Missouri — such as Indian corn, squashes, melons, and pumpkins — also found a place in some riverfront gardens. Nonfood crops were notable chiefly for their absence. A little inferior tobacco was grown, but attempts during the 1830s to introduce flax and hemp as commercial crops failed.

Domestic animals were found on almost every lot. The Scots of the Lower Settlement were the most pastoral-minded of all the colonists. Cattle, horses, oxen, pigs, poultry, and, to a lesser extent, sheep played an important part in the economy of the settlement. Cattle, sheep, pigs, and poultry provided food and clothing, while oxen and horses were kept as workstock and as a means of transport.

Most of the horses at Red River were hardy enough to spend the winter outdoors, but the other livestock had to be sheltered and fed during five or six months of winter. A little feed resulted from the settlement's arable farming, but wild hay from the plains provided the main support for Red River livestock.

The growth of the colony's livestock population led to a number of regulations and restrictions affecting hay gathering and animal grazing. These were intended to reduce squabbling by giving each settler an equal and fair chance to mow sufficient hay to tide him over the winter. Within the inner two miles, each colonist was able to mow the hay and graze his animals on his own two-mile-long lot as and when he wished. Some light timber was cut in the outer two miles, but the area was valued chiefly for its hay. Not all settlers had a hay privilege, however. In the parishes of St. James, St. Boniface, and St. Vital, part of the outer two miles was cut off by the junction of the Red with the Assiniboine and Seine rivers. Nor was the hay privilege a feature of the settlements established after the early 1850s along the Assiniboine River west of St. François Xavier.

Beyond the hay privilege was "the common," or open prairie. All settlers had equal rights to the hay and timber of the common, but access to it was regulated by the Council of Assiniboia, the colony's governing body. The common was usually thrown open for general use on 20 July. On this day, many settlers left their riverside homes with their scythes, hand rakes, and carts and set off to the lower stretches of the plains, where the slowly evaporating water produced an especially rich growth of grass. Sloughs, marshes, and other wet spots within easy reach of the colony were the favoured places.

THE ASSINIBOINE SETTLEMENTS

Many Red River farmers provided for their sons by dividing their lands. But new land was also colonized by people from long-established settlements, for as the population rose and farms were divided into smaller units, the Red River parishes became increasingly congested. By the 1850s the empty lands along the Assiniboine were functioning as a "safety valve" for these congested areas. Some of the westward movement went to the Assiniboine below St. François Xavier, but after 1851 a growing proportion went beyond, to the new settlement at Portage la Prairie, some 60 miles (97 km) up the river, the location of La Vérendrye's Fort la Reine (1738) and later of wintering posts belonging to the North West and Hudson's Bay companies.

It was the physical resources of the Portage la Prairie area that drew migrants from the Red River in quest of better living conditions. The location of the new settlement was selected by its founder, the Reverend William Cockran, who had examined the country between the western limits of Assiniboia and Fort Ellice in May 1850. His selection was based largely on the availability of four resources: fertile prairie land, abundant hay land, water from the river, and, probably most important, the largely unexploited stands of timber on the deep points of the middle Assiniboine. In addition, the northward bend of the river at the Portage brought it within easy reach of the Lake Manitoba fisheries.

A few persons moved to the Portage in 1851, but the main movement began in 1852–53. Most of the early migrants were English-speaking mixed-bloods from St. Paul and St. Andrew, parishes where overcrowding and the depletion of timber resources had created growing discontent. The most immediate cause of westward migration, however, was the major flood of 1852 (Case Study 18.2 on page 283), which converted large areas of the Red River Valley into a lake and left much of the back country of the lower Red as swamp. The higher land at Portage la Prairie promised freedom from future inundation. The Portage settlement survived despite the opposition of the Hudson's Bay Company, which tried to direct western migration to places

lower down the Assiniboine. Portage la Prairie was some 10 miles (16 km) beyond the jurisdiction of the Council of Assiniboia, and the Company feared that the new settlement might become a refuge for free-traders.

The most extensive new settlement during the 1860s also took place in the Portage district. Like the flood of 1852, the 1861 flood spurred a further outflow of people from the Lower Settlement to the empty lands at the Portage. By the spring of 1862, there were perhaps 200 persons in the area. The spread of settlement was both east and west from the original population node centred around St. Mary's Church at Portage la Prairie. The most spectacular developments were to the east, at High Bluff and Poplar Point (Figure 6.3). These three new communities were known collectively as the Portage Settlements, and by 1870 they had a combined population of almost a thousand.

The Portage area also attracted a large proportion of the immigrants arriving in the Red River Valley during the 1860s, most of whom bypassed the crowded parishes on the Red and the lower Assiniboine. With their populations of mainly English-speaking mixed-bloods and their emphasis on farming, the Portage settlements in many ways resembled the communities on the lower Red north of The Forks. However, their isolation from the main colony, their experiments in local self-government, and the significant proportion of recently arrived Ontarians in their population helped make them distinctive and self-conscious little communities. They also acquired a few commercial establishments to serve their growing populations, although as yet there was nothing that could be called a village. A Hudson's Bay Company store, known as Sinclair's Post or the Portage Fort, opened in 1860, and in 1868 a stream grist mill and sawmill opened at High Bluff.

THE SETTLEMENT PATTERN AT RED RIVER

As it had along the St. Lawrence, the river-lot system of land division produced a linear pattern of settlement, known in settlement geography as a straggling, row, or line village. Within the lots, settlers invariably built their homes and outbuildings near the river, and the houses were connected by a road or trail that ran parallel to the river. The resulting settlement consisted of a long line of farmhouses, perhaps 100–250 yards (91–227 m) apart. As the original lots were subdivided among children, the houses tended to get closer together, especially in the longer-settled areas north of The Forks on the west side of the Red.

Visitors to the colony attempted to describe the settlement pattern at Red River. Several included a comparison with the landscape of Lower Canada. To Governor Alexander Ramsay of Minnesota in 1851, the line of river-front farmsteads appeared as "a long suburban village,"[4] and to J.W. Bond, visiting at the same time and aware of the many twists and turns of the river, the colony was "a long serpentine village."[5]

One characteristic of the straggling village was that the various community services and facilities were usually not concentrated in one location but were scattered at different places on the long lines of settlement. The establishment of the first mission at Red River in 1818, the Catholic mission of St. Boniface, and the erection of a church on the east Red opposite The Forks, added another distinctive element to the riverine landscape. Further expansion of settlement along the Red River resulted in the creation of new parishes and the erection of additional churches, both Roman Catholic and Protestant, to serve the growing population. The churches, many with a school attached, functioned as the focal points of the settlement's religious, educational, and social life.

Grist mills were also a prominent feature of the early Red River landscape. A visitor from the United States observed in 1848 that the "grain is ground by windmills which form picturesque and conspicuous objects in the landscape of the plains surrounding the settlement."[6] For Hind, the windmills were the only visible evidence of any manufacturing activity at Red River. They were most conspicuous in the landscape north of The Forks, along the west bank of the Red, in the predominantly English-speaking Protestant parishes of St. John, St. Paul, and St. Andrew.

In 1856, 13 of the colony's 18 windmills were located in these three parishes. They comprised the longest-settled and most densely peopled part of the colony, and also the part where agriculture was most important and most advanced in the years before 1870. The Red River settlers harnessed not only wind power but also the energy of the flowing streams. With their flow regulated by dams, several of the numerous creeks that drained into the Red and Assiniboine provided an unreliable source of energy for mills that processed wheat. By 1856 there were 9 water mills at the Red River colony (Chapter 18).

Before about 1860, settlement was almost wholly dispersed and tied closely to the river. For a long time, several factors prevented the emergence of a town or even a village. The long-lot system inevitably had considerable effect on community development. The open, linear pattern of this method of land division made functional nucleation difficult. Beyond the parochial focus on the church as a general meeting place and centre of social and educational activity, nodal concentrations (i.e., craft or commercial activity) failed to develop within the elongated ribbons of river-front settlement. Such craft trades as smithing, woodworking, masonry, and grain milling were carried on by skilled individuals at their own dwellings, and income from such work mainly supplemented that derived from agriculture.

Second, the growth of a town usually depends on the development of trade. The economy of the Red River colony was dominated by the fur trade, which until 1849 was a virtual monopoly of the Hudson's Bay Company, whose commercial activities centred on four trading posts: Upper Fort Garry at The Forks; Lower Fort Garry, or the Stone Fort, in St. Andrew's parish; Lane's Post, built at the White

Horse Plain in the 1850s; and, after 1860, the Portage la Prairie post (Figure 6.3).

It was to these posts that the farmers carted their agricultural products and the hunters their "plains provisions," furs, and buffalo robes, which they exchanged for European goods brought into Rupert's Land through York Factory on Hudson Bay or, after 1858, via St. Paul, Minnesota. All administrative and judicial functions within the settlement were also concentrated at these same posts, especially at Upper and Lower Fort Garry. The Council of Assiniboia usually met at the Upper Fort, which also had the courthouse nearby, and the governor of Rupert's Land stayed at the Lower Fort when resident at Red River.

In 1870 the village of Winnipeg was the only truly nucleated settlement in the colony. The origins of Winnipeg can be traced back to the 1850s and perhaps even earlier, but not until 1862–63 was it recognized as a village. In April 1863 the *Nor'-Wester* newspaper posed the problem of the possible future location of a town at Red River and suggested the area around Upper Fort Garry, "because there is already the nucleus of a town there." The village was at first referred to as McDermotown or Drevertown, but by 1865 it was known as the town of Winnipeg, although the number of buildings hardly warranted that title.

Most urban centres depend on the growth of trade for their development and Winnipeg was no exception. As long as the Hudson's Bay Company held a monopoly over trading activities in the Northwest, all commerce could be conducted through trading posts erected at various strategic locations. Urban development could not get under way until this monopoly had been broken and commerce liberated so that independent traders could also take advantage of market possibilities.

Winnipeg was a result of the free-trade movement in Rupert's Land, which since about 1850 had led to a proliferation of merchants in the Red River Valley. It was also a product of the increasing volume and variety of international trade conducted between the Red River colony and the expanding towns of Minnesota. The commercial outlets of Canadian and American merchants were added to those of the old Red River free-traders to form a small trading centre.

Almost all these merchants chose to erect their stores and other commercial facilities close to The Forks, in the open area between the reserve land at the Upper Fort and the Point Douglas Common. It was a central location, advantageous for trade, that had seen a succession of trading centres since the 18th century: Forts Rouge, Gibraltar, Douglas, and Garry, and finally the town of Winnipeg (Figure 6.3). The Forks was at the centre of the most populous part of the colony and at the meeting place of both trails and waterways, so merchants could use both land and water routes to move their goods.

Houses were as yet few, and Winnipeg's dominant function was trade. Early Winnipeg was both a collecting centre for furs, buffalo robes, and other items out of the Northwest and a distribution centre for trade goods and imported foods carted or boated up from St. Paul. After the decline of the hazardous Nelson River route to York Factory in the late 1850s, the ties of most Winnipeg merchants were south to St. Paul and other smaller urban centres in Minnesota. By 1870 the village had over 200 inhabitants and had about 30 buildings scattered on both sides of the track leading north from The Forks, near its junction with the Saskatchewan or Portage Trail from the west.

CONCLUSION

Before the transfer of Rupert's Land to the Dominion of Canada in 1869–70, the settlement colony founded by Lord Selkirk was the most important centre of population and agriculture in the Canadian Northwest. When Manitoba became a province, the most obvious signs of earlier European activity were to be found in the parishes that had comprised the colony. From its tiny and uncertain beginnings in 1812, settlement spread upstream and downstream along the Red River and upstream along the Assiniboine, away from the centrally located Forks.

Colonization before 1870 was a competition for sites with river frontage that ensured quick and easy access to the main rivers and associated streamside belts of timber. Both settlement and agriculture clung closely to the edges of the rivers within the distinctive long-lot survey, a system of land division copied from that long employed in Quebec. Limitations of technology and the force of tradition, as well as the distribution of woodland and light, well-drained levee soils within the Red River lowland, limited settlement to a narrow band along the main rivers.

By 1870, when the population of the colony had risen to over 12,000, the long, thin strip farms of the settlers straggled for about 60 miles (97 km) along the Red and for a similar distance along the Assiniboine as far west as Portage la Prairie. Since about 1860, overcrowding in the older areas of settlement, resulting largely from the repeated subdivision of river lots among offspring, had brought about the spread of cultivation in parts of the colony away from the immediate vicinity of the waterways, into the open prairie beyond. But nowhere before 1870 had there been sufficient pressure on river-front space to modify the riparian nature of the colony or even to bring about a second range of settlement. The growth of the Portage settlements and the westward migration to them of people from other parts of the colony helped relieve the overcrowding along the lower Red after 1850.

Much of what was the heart of the Red River colony now lies buried beneath the brick and concrete of Greater Winnipeg, but certain of its distinctive aspects are still preserved in the present Manitoba landscape. In particular the long, narrow river-fronting lots stand out with great clarity, enveloped as they are by the square patterns of later township and section surveys (Figure 6.4). The river-lot areas of Manitoba are a constant reminder of an earlier way of life, and define

with some accuracy the riverine, farmer-hunter settlements of the early residents of the Red River Valley.

NOTES

1. W.F. Butler, *The Great Lone Land* (London: Sampson Low, Marston, Low and Searle, 1872).
2. A. Ross, *Red River Settlement: Its Rise, Progress, and Present State* (London: Smith, Elder, 1856), 201.
3. United Kingdom, *Journals, Detailed Reports and Observations Relative to the Expedition by Captain Palliser* (London: 1863), 8.
4. A. Ramsay, "Report of a Visit to Red River Settlement," *Senate Journal, State of Minnesota*, app. 8, 1857–58.
5. J.W. Bond, *Minnesota and Its Resources* (New York: Redfield, 1853), 286.
6. D.D. Owen, *Report of a Geological Survey of Wisconsin, Iowa, and Minnesota* (Philadelphia: Lippincott, Grambo, 1852), 182.

Case Study 6.1
The Buffalo Robe Trade and Hivernant Communities on the Northern Plains

Gerhard J. Ens

Métis hivernant or wintering communities in the northwestern plains are not a very well-understood phenomenon. Because they existed for such a short period (1840s to 1870s) and were very impermanent, little has been written about these villages and the way of life they represented. Despite their short duration, however, they were an important adaptive response to the changing economic and social conditions in the western interior, and were a crucial element in the emerging identity of the plains Métis in the last half of the 19th century.

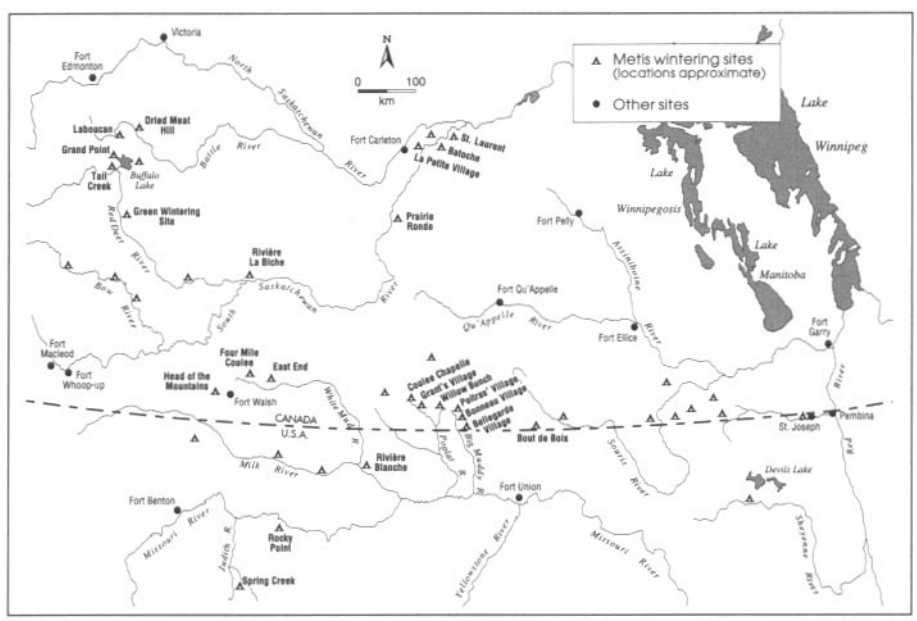

Figure 6.1.1 Location of Métis Wintering Sites during the Period 1850–80

Hivernant or wintering communities began to appear in the late 1840s at places like Turtle Mountain, the Souris Basin, Riding Mountain, and Wood Mountain, and on the Assiniboine, Qu'Appelle, and Saskatchewan rivers. They were a response to the westward retreat of the buffalo herds and the changing nature of the fur trade on the upper Missouri River.

Before 1840, the Red River Métis had secured most of the robes, leather, pemmican, and dried meat they required from their summer and fall buffalo hunts out of the Red River Settlement and Pembina on the Red River. Beginning in the 1840s, however, the buffalo retreated further and further west, and the hunters had to travel hundreds of kilometres before even spotting them. Also at this time, buffalo robes became increasingly important in the fur trade of the Missouri. Beaver stocks had been depleted, and buffalo robes found lucrative markets in New York, Montreal, St. Paul, and St. Louis.

These robes consisted of the skin of the buffalo with the hair left on and the hide tanned. Prime robes, those taken from November to February and in excellent shape, fetched good prices, up to $10–12 a robe in Montreal and in St. Paul, Minnesota, in the 1870s. Robes taken in summer had almost no value, as most of the hair had fallen or been rubbed out. Good robes were used as sleigh throws, wraps, and bedding, and were also manufactured into coats and boots.

The Métis responded to this new market by openly defying the Hudson's Bay Company (HBC) monopoly and smuggling their furs and robes across the border to the American traders. The HBC monopoly was finally broken in 1849, leading to a tremendous expansion in the production and trading of buffalo robes by the Red River Métis.

Métis hivernant camps were a direct result of these new economic opportunities. Beginning in the late 1840s and accelerating in the 1850s and 1860s, observers began to notice an increase in Métis wintering or hivernant communities west of the Red River and Pembina. While it was still possible to winter in St. Joseph (Walhalla) in the 1850s and be close enough to the winter range of the buffalo to get winter robes, it was certainly no longer possible to do so by wintering in the Red River Settlement or Pembina. As a result, more and more plains Métis families began spending their winters in small temporary communities west of the Red River, where they could easily hunt the buffalo. By the late 1860s and early 1870s, even the Métis from the settlement of St. Joseph were leaving in droves to winter on the plains, many never going back.

By the late 1840s there were reports of wintering villages at Turtle

Mountain and a number of locations on the Souris River. Evidence has also been uncovered of wintering villages in the Oak Lake area, and near Whitewater Lake and Pelican Lake. By the late 1850s and 1860s these villages were also found further west, at Moose Mountain, Wood Mountain, in the Qu'Appelle Valley, and on the North and South Saskatchewan rivers; by the 1870s they were found in the Cypress Hills, on the Battle and Red Deer rivers, and in Montana, on the Missouri River and the Judith Basin.

In effect, the villages could be found anywhere the buffalo wintered on the northern plains. They had names like Poitras Village, Grant's Village, Bellegarde Village, Coulee Chapelle, Bout du Bois, Prairie Ronde, La Petite Ville, Willow Bunch, and East End (Figure 6.1.1). Winters were spent hunting the buffalo, processing and tanning the buffalo robes, and trading with neighbouring Native bands.

The wintering sites varied in size from a few families to large camps with as many as a thousand inhabitants. The Métis winterers congregated for convenience and safety in villages consisting of huts roughly constructed but sufficient to protect them from the weather and to afford room for their goods and furs (Figure 6.1.2). They settled in sufficient numbers to protect themselves from hostile bands of Sioux, Assiniboine, and Blackfoot. They chose sheltered sites with water and wood near where the buffalo were expected to be during the winter. They built cabins in the late fall and abandoned them in the spring, often never returning to the same site but moving to a new one the next year. This was due in part to the changing location of the buffalo herds, but also because the Native bands often burned the shacks to the ground as soon as they were uninhabited. Norbert Welch, a trader and hunter in the 1860s and 1870s, estimated that he had built about 20 wintering houses during his years on the plains.[1]

At least until the late 1860s, the winterers would return to the Red River Settlement in the spring. The busy season for traders in the settlement was from May to June, when

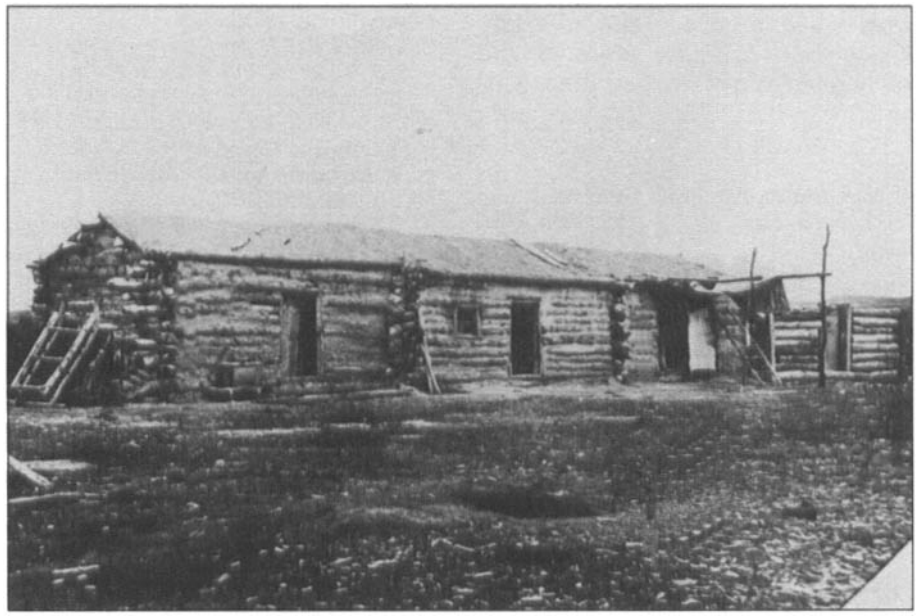

Figure 6.1.2 A Multi-room Hivernant Dwelling (Photograph: Provincial Archives of Manitoba [PAM], Collection: Boundary Commission, Negative N11946)

the winterers arrived from the plains to spend about a month trading their furs. When their business in the settlement was completed, they again left for the plains with the summer buffalo hunt or retraced their steps to their wintering quarters.

The basic social and material components of these hivernant villages were much the same regardless of size or locality, although the layout of the communities was much affected by the physiographic features of the site. A typical hivernant settlement consisted of Métis hunters and their families (family labour being crucial in processing the buffalo robes), a few Métis traders, and by the 1850s and 1860s a missionary priest. The houses that sheltered this population were rude, one-room shanties built very quickly using only an axe and a crooked knife. It seldom took more than a day or two to build one.

The shanties were virtually identical to each other, and very simple in style. Most consisted of one room, although wealthier traders might have two houses or a multiroom dwelling. They were built of rough poplar or spruce logs morticed together at the corners of the building. The logs, which were rarely squared, did not fit together very well, leaving large cracks that were filled in with mud and straw. The walls were approximately 6 feet (1.8 m) high in front and a little over 5 feet (1.5 m) behind. A huge clay fireplace and chimney took up the space of one of the exterior walls. Doors and windows were simply cut out of the solid log walls, and a door could be constructed from the boards of a cart. Windows consisted of a piece of parchment. The roof was covered with straight poles of young pine, over which was placed a thatch of marsh grass weighed down by loose earth. The lowness of the building was sometimes remedied by digging out the ground for 2 feet (0.6 m). In rarer, more substantial buildings, gables and board roofs were added.

Most hivernant villages contained a few larger buildings to accommodate religious services and the dances that served as the main entertainment during the long winters. The winter quarters of important Métis traders were large, spacious one-room structures that accommodated not only their retinue of relatives and followers but also their trade goods. These traders also had a second building, which served as their storehouse for gunpowder, furs, robes, leather, and provisions.[2]

The leader or Métis chief of the village was usually the best hunter or main trader. Leadership, however, was to some extent shared with the missionary priest who increasingly

lived among the hivernants. In fact, there was a unusual partnership between the Métis chief and the missionary, as each benefited from the support of the other. A problem encountered in larger wintering camps was increased social tension, and some way had to be found to mend the social fabric when disruptive incidents occurred. Communities that could not develop adequate mechanisms of this nature were destined to remain small, isolated household units.

Given the hostility of the Sioux, Assiniboine, and Blackfoot bands towards the Métis, small household hivernant camps would have fared disastrously. Among the Natives, kinship was a sociopolitical mechanism that alleviated social discord, permitting large groups to live together for short periods. Among the plains Métis, who by the 1840s were only a second-generation people, time had not permitted such extensive kinship systems to develop. Thus, kinship had limited value as a social mechanism to permit extended household units to come together as regional bands.

In these circumstances the missionary could be of value. Besides offering religious rites and solace, he could help alleviate social tension and make possible social harmony in large hivernant camps.[3] In fact, the importance and presence of missionaries caused the Métis to refer to their hivernant villages as *la mission.*

Eventually, as the buffalo disappeared in the late 1870s and early 1880s, these hivernant communities lost their economic function. Some, like St. Laurent and Batoche, made the transition to small agricultural communities, but most communities simply disappeared with the buffalo. Hivernants from these disbanded villages either homesteaded, joined Native bands (such as the Turtle Mountain Chippewa), or drifted into more settled communities, both Native and white. Despite their short existence, these hivernant camps constituted a critical historical experience that saw Métis households come together and function as communities.

NOTES

1. M. Weeks, *The Last Buffalo Hunter* (New York: Thomas Nelson and Sons, 1939), 167.
2. I. Cowie, *The Company of Adventurers: A Narrative of Seven Years in the Service of the Hudson's Bay Company During 1867–1874* (Toronto: William Briggs, 1913), 349–50.
3. J.E. Foster, "Le Missionnaire and le Chef Métis," Paper presented to the Symposium on the History of the Missionary Oblates in Western Canada. Institut de Recherche de la Faculté Saint-Jean, 1989. See also H.M. Robinson, *The Great Fur Land or Sketches of Life in the Hudson's Bay Territory* (New York: G.P. Putnam's Sons, 1879), 254–88.

SETTLEMENT: THE MAKING OF A LANDSCAPE

7

John C. Lehr

When the vast territory of Rupert's Land was ceded to the government of Canada in 1870, there was only a tenuous agricultural presence in the West. The farms of the Selkirk settlers, the Métis, and the retired servants of the Hudson's Bay Company clung to the banks of the Red and Assiniboine rivers, and elsewhere agriculture survived only in small gardens in the shadow of fur-trading forts and posts. Without the technology, resources, or adaptive strategies to engage in farming on the open grasslands, these early agriculturalists remained closely bound to the woods, water, and meadows found along the rivers.

Incorporation into Canada would have a dramatic effect upon the Manitoban landscape, but the full impact of European settlement was not felt for over a decade. The change in the political status of the region meant little unless the preconditions for settlement were fulfilled: the conclusion of treaties with the indigenous peoples and their placement on reserves; the establishment of legal and administrative authority; the survey of the land to permit its orderly occupation by agricultural settlers; and the forging of a secure, dependable, and economical communication link giving access to the markets of the industrial heartlands of central Canada and Europe.

A series of treaties negotiated with the indigenous peoples of the prairies confined them to reserves and legally spelled the end of a nomadic way of life already changed in Manitoba by the economic influence of the fur trade and the increasing presence of European land-seekers. Under these treaties (Case Study 9.1 on page 133), the Native peoples, who had little or no knowledge of farming, were given tracts of land sufficient to "furnish one hundred and sixty acres [64.8 ha] for each family of five, or in that proportion for larger or smaller families," upon which they were expected to reside and provide for themselves.[1]

The location of the reserves in southern Manitoba loosely reflected the distribution of a nomadic people when the treaties were signed; in the north the church missions served to attract people and thus often became the centres of new communities that from the first lacked any economic rationale or potential for development. For the Native people it was the end of an era of freedom and economic self-sufficiency, and the beginning of a life of exclusion and dependency, as the lands across which they had hunted were thrown open to agricultural settlement by Europeans.

The Dominion Lands Act of 1872 set the framework for the agricultural settlement not only of Manitoba but of the entire western interior.[2] Its regulations shaped the course of settlement and were instrumental in creating the distinctive look of the prairie landscape (Case Study 7.1 on page 102). Although the original act was amended numerous times and the regulations affecting homestead settlement differed in matters of detail, the broad terms and conditions of the act remained constant.

It established that the 160-acre (64.8 ha) homestead was to be the basic unit of settlement, that entry for a homestead could be made for a

nominal administration fee of $10, and that full and clear title — the patent to the homestead — would be awarded after three years if the settler had fulfilled certain obligations. The settler had to reside upon his homestead for at least six months every year for a minimum of three years; build a house of specified dimensions with windows and a door; and break and cultivate a specified area — usually about 30 acres (12 ha) was sufficient — before applying for patent. In heavy bush country, as an alternative to clearing land, the settler was required to keep a certain number of cattle upon the homestead for three years. Finally, before the patent was awarded, the applicant had to obtain British citizenship. These duties were designed to ensure that the applicant was indeed a bona fide settler and not a land speculator who would not make a contribution to the development of the country.[3]

The Dominion Lands Act also reflected the realization on the part of the government that the rapid development of the West was going to be difficult and costly. It thus provided for compensating the Hudson's Bay Company for ceding the territory to the Crown by granting Section 8 and three-quarters of Section 26 in every township to the Hudson's Bay Company, and it also reserved two sections (11 and 29) for the support of schools (Figure 7.1). Every odd-numbered section was preserved from homestead settlement and retained by the government for preemption purposes or as lands from which the railway companies would be able to select land as payment for building track in the West and in northwestern Ontario.

The effect of the Dominion Lands Act upon settlement was profound. The residency requirement meant that nucleated village settlement was impossible for settlers who arrived independently, and was still difficult to achieve for cohesive groups that wished to settle a particular locality en masse. If a group was sufficiently organized, it could appeal for the "hamlet clause," which permitted them to fulfil their agricultural duties while residing off their homesteads in a village.[4]

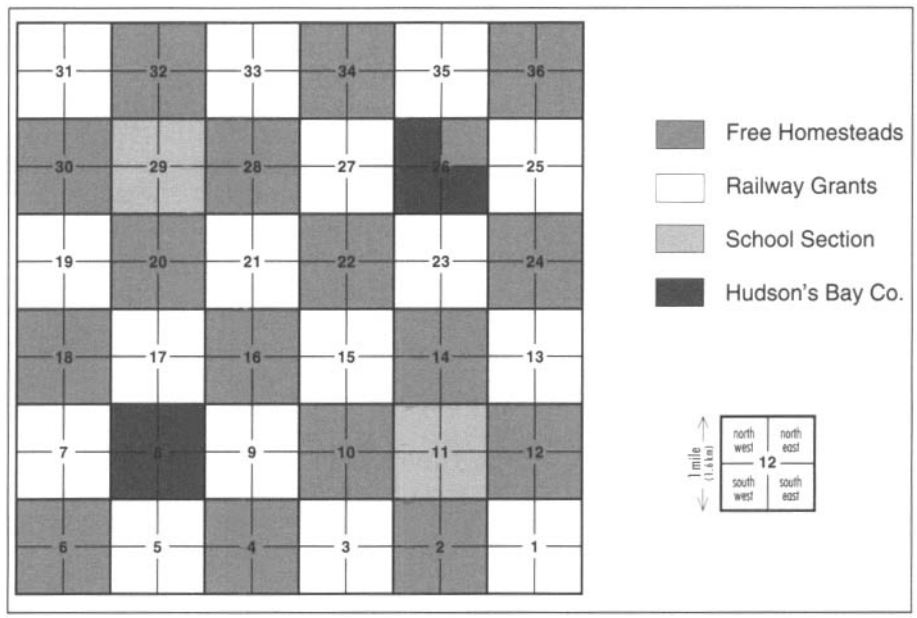

Figure 7.1 Regulations of 1881 (Source: Modified from J.L. Tyman, By Section, Township and Range *[Brandon: Assiniboine Historical Society, 1972], 24)*

Such exemptions were comparatively rare. The effect of the act was to make a dispersed pattern of settlement the norm, which, perhaps unwittingly, threw up one more deterrent to settlement by depriving settlers of the social advantages of nucleation. Some, such as the Mennonites, were able to secure an exemption from the residency requirement of the act (Case Study 7.3 on page 105), but the Hutterites who settled permanently in Manitoba only after 1917 established nucleated settlements by purchasing land and remaining outside the act and its regulations (Case Study 15.1 on page 233).

In payment for building track across northwestern Ontario, in the Prairies, and in British Columbia, railway companies were granted some 32 million acres (12,949,952 ha) of government land deemed fit for settlement.[5] The Canadian Pacific Railway (CPR) received the lion's share of this: 12,500 acres (5,059 ha) per mile for the first 900 miles (1,448 km), 16,666 acres (6,744 ha) per mile for the next 450 miles (724 km), and 9,615 acres (3,891 ha) per mile for the last 640 miles (1,030 km).

The CPR was free to select land from a 20-mile (32 km) belt on either side of the track, but tended to select only the best land; thus it chose not to take land in Ontario but rather selected prairie land. Nearly 208 miles (335 km) of track were built in Manitoba, but the CPR took a total of only 2,183,084 acres (883,464 ha), or 10,495.6 acres (4,247 ha) for each mile built in the province. This reflected the railway's policy of selecting grants from the territories where no provincial criticism was then to be encountered, so Manitoba escaped relatively lightly.[6]

From the perspective of economic development, this was fortunate, as the railways tended to be ineffective promoters of settlement even upon their own lands; they found it in their interest to delay selecting land and to avoid taxes until there was pressure for more land to be opened for settlement. Only then would they select the most promising areas and sell land to settlers and speculators alike. The railway strategy delayed the course of settlement and acted against the best interests of the districts where they had rights to select land.

While the region remained isolated from markets in eastern Canada by the formidable physical barrier of the Canadian Shield to the east and the political boundary of the United States border to the south, Manitoba and the Northwest Territories attracted few settlers. Those who came to western Canada came mostly to Manitoba, and came

despite economic and physical conditions, not because of them. Until the completion of the transcontinental link in 1885, access to homestead lands on the United States frontier was far easier and economically more attractive to most settlers.

Nevertheless the Canadian government had some success in luring immigrants to the West, for although it remained remote from eastern Canadian markets throughout the 1870s, Manitoba was accessible via the Great Lakes water route and the Dawson Trail from Lake of the Woods through southeastern Manitoba to St. Boniface; by rail through the United States to the railhead at Minneapolis and, later, Moorehead; and by steamboat down the Red River to Winnipeg.

In the 1870s, in the prerailway era, the Dominion government for the most part tried to attract independent settlers by promising free land under British dominion, although to sweeten the pot for those without any particular affiliation with the British Crown, they also set aside special reserves of land for development by colonization companies.

For example, land was reserved for the Dominion Steamship Company, the Allen Line, the Hamilton and North West Colonisation Company, and individuals promoting settlement schemes.[7] Few of these were successful (Case Study 7.2 on page 103). In contrast, the government's readiness to accommodate particular ethnic or religious groups by reserving land for their exclusive settlement occasionally paid more handsome dividends and set the foundation for a mosaic of ethnic settlement that was to bequeath to the province a bewitching array of cultural landscapes.

RESERVE SETTLEMENTS

Although the Dominion government set aside a number of "ethnic" reserves, few were successful in attracting the expected numbers of settlers into the province. These reserves were often small and poorly promoted. Few Swedes came to settle on the Swedish Reserve; the land set aside for Scottish crofters near Killarney attracted tens rather than hundreds; and the Hungarian reserve at Huns Valley on the south slopes of Riding Mountain attracted few and retained fewer. The small reserves of land for French settlers on the west bank of the Red and in the Lorne area were not particularly successful, attracting barely a thousand immigrants.[8] Many felt that the reserve system actually retarded settlement by locking up land and discouraging settlers who arrived independently.[9] However, three reserves were quite successful in inducing considerable numbers of people to settle in Manitoba: the two Mennonite Reserves (Case Study 7.3 on page 105) and the Icelandic Reserve.

Mennonite Settlement

In 1873 a delegation of Mennonites from Czarist Russia visited Manitoba (Case Study 7.3 on page 105). They were impressed favourably enough by the country and the incentives given to them by the Dominion government to recommend settlement in Manitoba to their fellows. Between 1874 and 1876, some 8,000 Mennonites settled in Manitoba in two large reserves, one in the bush country east of the Red River, the other on the open prairie west of the Red (Figure 7.3.1 on page 106).[10]

The government's selection of land reflected the prevailing attitude towards settlement on the open prairie. The Mennonite East Reserve was located in Manitoba's "bush country," an area characterized by indifferent soils with a cover of scrub oak and aspen. It was not rich in agricultural potential but offered the typical settler a good deal in the way of resources to ensure short-term survival. The government considered these lands among the best for settlers who were not extremely well endowed with capital. This was not an inaccurate assessment of such areas at the time. Only as command of technology and knowledge of adaptive strategies for prairie farming increased did the bush country come to be considered less than satisfactory for placing highly sought-after settlers.

Few settlers in the 1870s or the early 1880s had the capital, technology, or adaptive strategies to move out onto the open prairie, away from supplies of wood for fencing and fuel, and away from a ready supply of water. The Mennonites' move across the Red River onto the grasslands was significant in that it demonstrated that the open prairie was capable of being settled by people experienced in farming dryland environments. Even when the Mennonites had demonstrated the potential of farming on the open prairie, however, few were able to avail themselves of the opportunity. Most incoming settlers were not affiliated with such a tightly knit social group and, as individuals, could not reduce their dependence on fencing by practising open-field agriculture and herding their stock; nor could they receive the economic advantages of community cooperation or the social benefits of nucleated settlement.

Icelandic Settlement

Even settlers commonly regarded as advantaged had a hard time on the Manitoba frontier in the 1870s. The Mennonites fared well, especially on the grasslands of the West Reserve, but the Icelanders, whose reconnaissance party never gave serious consideration to settlement on the prairie and chose land on the west shore of Lake Winnipeg, were less fortunate.

The land reserved for their settlement was a narrow strip approximately 8–10 miles (12.9–16.1 km) wide running 42 miles (67.6 km) northward from the provincial boundary of the time, an area of over 450 square miles (1,165 km^2), although at the time only half the land was available for settlement (Figure 7.2).[11] Alternate sections were closed to homesteading pending selection by the CPR as part of its land grant. Consequently, the Icelanders were forced to scatter their settlement along the shore of the lake, and many took land in the interior, often sight unseen. All were confronted with an unfamiliar woodland environment very different from the open heaths of their homeland, and were ill prepared for the tasks that faced them: clearing and draining land, logging, constructing log houses, and fishing in

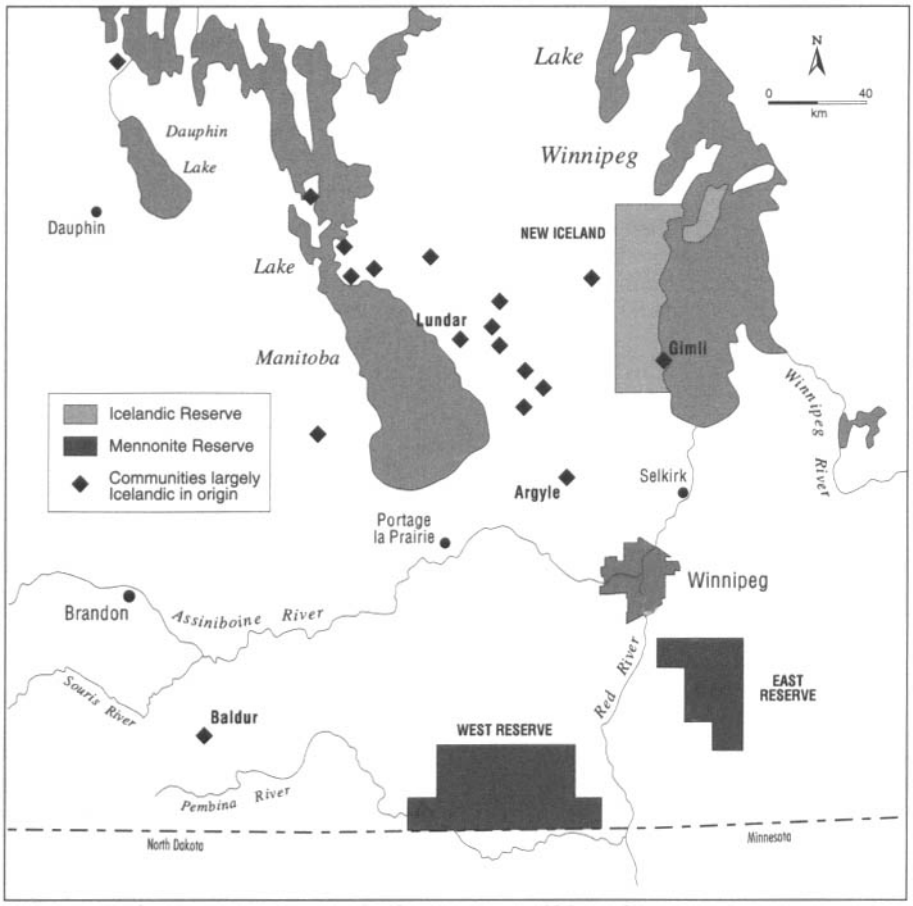

Figure 7.2 Icelandic and Mennonite Settlement Areas of Manitoba

a shallow freshwater lake. Without proper equipment, they caught few fish and lived through their first winter on limited supplies of flour, pemmican, and potatoes brought in from Winnipeg.

Progress was slow for the Icelanders. By the end of 1877, only 515 acres (208.4 ha) had been cleared in the entire reserve, and a survey of food resources revealed that of 255 families, 116 had sufficient for the coming winter, 116 had barely or less than enough, and 23 were destitute. Their crops were poor; hay was scarce, for what they had first thought to be hay meadows were marshes. In 1876–77 smallpox took over a hundred lives. For 228 days the reserve was quarantined and cut off from its supply base and main source of outside employment.[12]

The Icelanders' survival was due in part to their experience of, and preference for, fishing. By 1877 some had begun to trade surplus fish for provisions at the Gimli store, and by 1882 small-scale commercial fishing began, with Winnipeg as its market (Case Study 18.1 on page 281). More important, however, was employment outside the reserve. Many men laboured in Winnipeg or in logging camps, and some women worked as domestic servants in Winnipeg. It was common for families to remain on the farm while the men sought off-farm work.

Although the colony received over a thousand new immigrants in the winter of 1882, some of the original settlers were already leaving. In 1878–79 about 30 families moved to North Dakota seeking better land and a more promising future. In 1880 another large group left to establish the Argyle settlement between Baldur and Glenboro (Figure 7.2), and others settled permanently in Winnipeg. By the end of 1881, before the second wave of Icelandic migrants arrived, only 50 families were left in the reserve.[13]

When it was first settled, the Icelandic Reserve was outside the boundaries of Manitoba (Figure 1.2 on page 5), but in 1887 the province assumed full administrative authority over it and its population of about a thousand people, an action that mirrored the growing integration of the region and the extension of the frontier beyond the limits of the original "postage stamp province" of Manitoba.

INDEPENDENT SETTLEMENT

The diversity of ethnic groups that came to settle in Manitoba makes it easy to forget that the English-speaking settlers from Ontario and Great Britain constituted the majority of settlers in Manitoba from the opening of the frontier in 1870 until the settlement era drew to a close at the onset of the First World War. In the early 1870s it appeared that Manitoba would be settled almost entirely by people from eastern Canada, mostly migrants from Ontario, with some French Canadians and a sprinkling of Maritimers. Most of them seem to have had some capital. Generally they made their way from the international border to Winnipeg, and bought farms in the already-settled areas or took homesteads in adjacent districts. They followed trails running north and west from Kildonan and established settlements beyond Stony Mountain in the southern Interlake district and along the Assiniboine at Portage la Prairie, beyond the old river-lot settlements.

The physical geography of the area played a role in deflecting these settlers away from the wetter lands of the Red River Valley towards the slightly higher, better-drained, and dryer "uplands," while the presence of timber lured early settlers to the Pembina escarpment and the wooded uplands to the west.[14] For the most part, settlers remained bound to the lifeline of timber or the railway.

In the 1870s and 1880s it was difficult to retain these settlers, many of whom saw greater opportunities in the United States. In some years probably as many farmers left the province as new settlers arrived. Certainly the inability to attract and hold settlers was a source of

concern, but the causes were largely beyond the control of the provincial government, being partly economic and partly a reflection of a rather lacklustre approach to western settlement by the Conservative federal government. Nevertheless, the greater part of southwestern Manitoba was settled by these English-speaking settlers from Ontario and Great Britain.[15]

Clifford Sifton, Minister of the Interior, 1897–1905

The election of a new federal government under Sir Wilfrid Laurier in 1896 was to have a dramatic effect upon the social geography of Manitoba and the Northwest. Not only did the easing of a worldwide economic recession, a concomitant surge in wheat prices, and renewed interest in western settlement coincide with the election of the Liberals, but Laurier appointed the energetic Brandon lawyer Clifford Sifton as Minister of the Interior responsible for the settlement of the west.[16]

Previously, under Conservative administrations, English-speaking settlers from Great Britain, Ontario, and the United States, and other Protestants from northwestern Europe, were the preferred settlers towards whom virtually all recruitment efforts were directed.[17] Whether this type of settler simply could not be recruited in sufficient numbers, or whether, as Sifton contended, those responsible for attracting immigrants were incompetent, is a moot point. What is certain is that in the 1880s and early 1890s, bona fide settlers with agricultural experience were not coming into Manitoba or the Northwest Territories in the expected numbers.

Sifton's energy wrought significant changes in the Ministry of the Interior. He staffed the Immigration Branch with his own appointees, most of whom were Liberals who shared his vision of a dynamic, settled western Canada. He forced the railways to select the lands to which they were entitled, and redefined the qualities most valued in an immigrant.

At the time, his ideas were radical and embroiled the government in prolonged controversy about the nature of the new society emerging in Manitoba and the Territories, for under his policy, knowledge and experience of agriculture carried more weight than ethnic origin, knowledge of English, or adherence to the Protestant creed. Accordingly, Canadian immigration efforts were refocused from the littoral of Protestant northwestern Europe to the heartland of peasant Europe, to the polyglot Greek Orthodox and Roman Catholic peoples of the old Austro-Hungarian Empire: the Poles, Ukrainians, Magyars, and Germans.

Ironically, although Sifton is often credited with initiating Slavic immigration into western Canada, the stage was set before he was appointed Minister of the Interior. Sifton took advantage of the moment, turned a trickle into a torrent, and recast the social geography of Manitoba. His policies were not changed significantly by his more cautious successor, Frank Oliver, so their effects lasted well beyond his tenure.

Ukrainian Settlement

As early as 1891 Ukrainians from the Austrian province of Galicia immigrated to Canada seeking free homestead land and, initially at least, following German-speaking settlers from the same part of Galicia. These settlers, about 400 or so, all went to homesteads in east-central Alberta, but their presence there attracted the attention of Josef Oleskow, a Ukrainian professor of agriculture in L'viv, Galicia, who opposed the emigration of Ukrainian peasants to Brazil and sought a more promising destination.[18]

Oleskow contacted the Canadian government in 1895, inquiring about settlement opportunities. Based on information sent to him and on his own inquiries, he published a pamphlet, *Pro Vilni Zemli* (*About Free Lands*), that cautioned against emigration but concluded that Canada looked like the most promising destination. In 1895 Oleskow and a peasant delegate came to Canada at the invitation of the Canadian government to visit the Ukrainian settlement in Alberta and to scout likely spots for a land reserve where other groups of Ukrainians could be settled.

In Manitoba, Oleskow visited the Mennonite West Reserve, discussed farming conditions with Mennonites and other experienced farmers, and explored the area around Gretna and Dominion City.[19] On his return to Galicia, he published another pamphlet, *O Emigratsii* (*On Emigration*), in which he enthusiastically endorsed Canada as a destination for Ukrainian emigrants and identified two places in Manitoba that he thought to be the most promising from the standpoint of the Ukrainian peasant: the Stuartburn area east of Dominion City and the area north of Dauphin.

The first Ukrainians to settle in Manitoba arrived in 1896, when a party of about 27 families organized by Oleskow arrived, intending to look for homesteads in the Dauphin area. Unfortunately the railway had not yet reached Dauphin, which was accessible only by a 60-mile (96.6 km) journey from the railhead near Gladstone over roads that were virtually impassable after heavy spring rains. The Interior Department was also convinced that the best interests of the immigrants and the government would be served by locating them beside one of the Mennonite reserves. There the new immigrants would be able to secure employment with well-established and experienced farmers, many of whom were also conversant in Ukrainian. The party was therefore persuaded to seek land in the south of the province.

Unable to find a contiguous area large enough to provide 30 or more homesteads in the area adjacent to the Mennonite West Reserve, the party trekked east past Dominion City to the eastern margin of settlement at Stuartburn, on the Roseau River. There they found enough land for about 35 or 40 families — poplar groves, scrubby prairie, and meadowlands, which the settlers thought well suited for their intended mixed farming and dairying.

Although the government judged these lands to be not the kind that would appeal to the usual settler, this aspen bush country offered the peasant settler the advantage of a

wide resource base that promised self-sufficiency even in the early years.[20] There was abundant wood for fuel, fencing, and building; water was readily available from the river or by digging shallow wells; wild fruits, nuts, and berries — saskatoons, cranberries, hazelnuts — abounded; sloughs and meadows provided ample hay; and wildlife could be hunted or trapped. Equally important, settlers on these bush homesteads had the opportunity to obtain some income without having to leave their homesteads. Timber could be cut and sold as cordwood, and on many homesteads snakeroot (*Polygala senega*), used in the manufacture of pharmaceutical products, could be collected and sold to local stores for 12–15 cents a pound. A family could thus earn a dollar a day without having to seek off-farm work.

Against this had to be set the quality of the land for agriculture. The soil was mostly stony and shallow, in an area prone to spring flooding, infested with wood ticks and mosquitoes and difficult to clear. It was, however, far better suited to the needs of cash-poor settlers than the richer lands to the west, which offered little in the way of environmental diversity and hence few opportunities for self-sufficiency in the first years.

This environmental appraisal, shaped partly by past experience in western Ukraine, where farms were small and where wood was an expensive commodity, and partly by the immigrants' poor financial standing upon arrival, set the pattern of Ukrainian settlement throughout Manitoba. Like the English-speaking settlers who had arrived a decade earlier, the Ukrainians sought wooded land.[21] What made their settlement behaviour different was a lack of capital upon arrival, and hence greater dependence on woodlands and a seeming disregard for other factors such as soil quality or distance from urban centres.

CHAIN MIGRATION

To prefer the company of those who share the same aspirations and religious and cultural values, speak the same language, and share a common heritage is perhaps one of the most basic human traits. In the movement of people from one part of the world to another, this behavioural trait results in chain migration. This occurs when a primary decision-maker migrates to an area where there are no others from the same group and is in due course followed by friends and relatives, who, in turn, are followed by their friends and relatives, and so on.

Whereas the migration of the Mennonites and Icelanders to Manitoba was group migration, involving the movement of entire communities, the migration of most other peoples to Manitoba demonstrated at least some elements of chain migration. This chain migration was a factor in the settlement of English-speaking pioneers in western Manitoba.[22]

For the Ukrainians and other peasant settlers from eastern Europe, such as the Romanians and Poles, who settled beside them, the attraction of friends and relatives was far stronger. For English-speaking pioneers, settlement in Manitoba was often a bewildering experience, but cultural adjustments were far less difficult and wrenching than they were for the eastern Europeans, for whom everything was foreign: the language, food, social customs, legal system, religious institutions, and, for some, even the Latin alphabet. Not surprisingly, they clung to the social security of family and friends who had arrived before them. As a result, the Ukrainian settlements tended to replicate the geography of the old country in microcosm, as people from the same villages clustered together and these village groups formed larger regional clusters. Thus these "foreign" settlements were not a homogeneous mass of Ukrainians as the English often supposed, but were communities with well-defined cultural differentiations and frequently very distinctive religious divisions based on the regional split between the Uniate (Greek Catholic) church in Galicia and the Greek (Russian) Orthodox church in Bukovina.[23]

Chain migration had a number of important consequences for the geography of eastern European settlement in Manitoba. First, the determination of many to settle as close as possible to friends and family led some to ignore the agricultural quality of the land they were selecting. In the Stuartburn and Interlake areas, for example, incoming Ukrainians ignored the sensible advice of government immigration officers and took homesteads alongside relatives that they normally would have rejected because of the poor quality of the land. Second, and more significant from the government's perspective, chain migration threatened to create a difficult political problem for the government. Once started, chain migration was difficult to control. The government found it hard to break the chain and persuade an immigrant to be the first to start a new colony, so as to deflect some immigrants into a new area.[24]

Fortunately, in 1897 the nuclei of Ukrainian settlements were established in the Dauphin area, the Cooks Creek area northeast of Winnipeg, and the Interlake, followed by the Whitemouth and Ethelbert areas in 1898 and 1899, respectively. Other Ukrainians and some Poles from Galicia were persuaded to buy Red River lots in East Selkirk and St. Norbert by Roman Catholic clergy who had land to dispose of and who hoped to bring the Greek Catholic Ukrainians into the Roman Catholic church, so Ukrainian settlements were scattered throughout the aspen parkland and boreal margins in Manitoba.

Led by a desire to settle with friends and family and by a realistic understanding of the kind of environment that offered them the best chance of survival on a strange frontier, Ukrainian settlers pushed north into the Interlake, and moved on to the southern slopes of the Riding Mountains and northward to the Dauphin Lake plain. Towards the end of the settlement period, intermixed with British and others, they helped pioneer the Swan River Valley and agricultural areas further north.

The settlement process was highly political and often unsavoury, for large settlements of any non-British group were not looked upon favourably in the 1890s. The

creation of "little Polands" and "little Galicias" was widely feared, since settlers in such ghettolike concentrations were removed from exposure to Anglo-Canadian ways and all Canadian political parties agreed that it was desirable that the newcomers be assimilated into Anglo-Canadian society as quickly as possible.

The Conservative Party was especially opposed to the immigration of any eastern European peasants. From 1896 until the new settlers became eligible to vote in significant numbers around 1903, the Tory press, particularly the *Winnipeg Telegram,* waged a sustained vituperative campaign against Ukrainian settlement in Manitoba and the West. Ukrainians, it claimed, were "the scum of Europe" and an economic and social liability. They were dishonest, superstitious, priest-ridden and purchasable, dirty and of questionable moral character; and their presence served only to discourage the more "desirable" English or northwestern European settlers from coming to Manitoba.

The Liberal Party and Sifton countered these accusations through John Dafoe's editorials in *The Manitoba Free Press,* which stoutly defended the Ukrainians, portraying them as hardy, thrifty peasants with the agricultural expertise and tenacity to open up the West.[25] Nevertheless, the Ukrainians found it more difficult to gain acceptance than settlers from northwestern Europe, whose religious affiliations and cultural norms were closer to those of the ruling Anglo-Canadian elite.

JEWISH SETTLEMENT

As early as 1884 Jewish pioneers were taking homesteads in western Canada, but they did so west of the Manitoba border. Because of the need to settle close together in order to faithfully observe religious laws, most Jews preferred urban locations. Indeed, few Jewish immigrants had any agricultural experience, and because of widespread anti-Semitism and a perception that they were interested only in business opportunities in the urban centres of the West, they were discouraged from immigrating to Canada. Nevertheless, before the turn of the century a few settled on land purchased from established settlers in the areas immediately surrounding Winnipeg, such as Kildonan and Pine Ridge, where their farms supplied the growing urban market.[26]

In 1905 a Jewish agricultural settlement was established in the Interlake area by Samuel Bender. In an attempt to overcome the religious difficulties faced by Orthodox Jews living on widely scattered homesteads, Bender applied for and received the "hamlet clause," which allowed his group to live together in a village and fulfil their homestead obligations away from their land.[27] These Jewish settlers were thus able to create a small community; hire a Jewish schoolteacher, rabbi, and *shohet;*[28] and summon the necessary quorum of 10 adult males for prayers in the synagogue on the Sabbath.

The settlement maintained its population until the early 1920s, but isolation, bad roads, low agricultural prices, and the difficulty of either pursuing a Jewish secondary education or finding a marital partner in the tiny settlement caused families to drift away to Winnipeg. With every departure, Bender Hamlet became progressively less attractive to those who remained, and it was soon abandoned, the victim of circumstances that led to a similar fate for all other Jewish settlements in western Canada.[29]

THE MISSING FRENCH

Although in 1870 there were concentrations of French-speaking (Métis and French Canadian) settlers in Manitoba on river lots along the Red, Assiniboine, and Seine rivers, and at scattered points elsewhere (in the Somerset region and at Ste. Rose du Lac on the shore of Dauphin Lake[30]), subsequent immigration of French-speaking settlers from Quebec or France never came remotely close to rivalling the immigration of Anglophones from Ontario and Great Britain. Yet immediately after the opening of Manitoba and the Northwest to settlement, there was reason to believe that the French, for whom the government set aside reserves, would constitute a major element in the forthcoming immigration. That they did not immigrate in the anticipated numbers has sometimes been ascribed to a deliberate governmental policy of favouring Anglophone and Protestant immigrants and discouraging French and Catholic settlement.

According to Silver, Painchaud, and Ross, however, this had little to do with it.[31] Rivalry between the ultramontane Catholic clergy of Quebec and the more liberal Catholic clergy in France caused the French clergy to discourage emigration to Canada. The Quebec Catholic hierarchy, on the other hand, was reluctant to advocate emigration to Manitoba and the Northwest for fear of losing their population base, which they regarded as vital for the survival of Francophone Catholicism in Quebec.

In Manitoba, the Catholic clergy wanted immigration of Catholics, who, they felt, would affiliate with the French and counter the influence of the English Protestants. To discourage prospective Anglophone settlers, Archbishop Taché of St. Boniface deliberately wrote alarmist stories, aimed at the Ontario population, about the difficulties and perils of pioneering in Manitoba. His strategy backfired when his claims came to the attention of the Quebec population, who, given their impeccable source, did not doubt their veracity![32]

The result of all this was a meagre influx of Francophones. Relatively few came directly from France or Quebec, but the government had some success in attracting expatriate Quebecers from the textile towns of New England to return to Canada and settle in Manitoba. St. Jean Baptiste and Letellier on the Red River, for example, were both established in the 1870s by Quebecers who came via New England.

Elsewhere, Francophone Catholic communities incorporated Swiss settlers from the Jura region, as at St. Claude, and Walloon and Flemish settlers from Belgium, who mostly settled in the rural municipalities of Lorne and Cameron between 1885 and 1930, gravitating to the French Canadian village of St.

Figure 7.3 Francophone Settlements of Manitoba (Source: Compiled from data included in Société Franco-Manitobaine, Manitoba's Francophone Community: At the Heart of America *[St. Boniface: Société Franco-Manitobaine, 1995])*

Alphonse and establishing the village of Bruxelles (Figure 7.3).[33]

A MOSAIC OF LANDSCAPES

In the first decades of European settlement, the melange of peoples who settled Manitoba brought to the new land many elements of their material culture, although the rigidity of the sectional survey precluded the widespread transference of settlement patterns. Only the Métis and the French on their river lots and the Mennonites on the East and West reserves were able to replicate their former settlement patterns.[34] Even the Mennonites, although they were permitted to fulfil their homestead obligations while residing off the homestead in a village, had difficulty maintaining their villages and open-field system of agriculture because the government insisted that title to a homestead be held by an individual, not by a group. Denied legal underpinning, open-field agriculture ceased to be practised by 1930, and many villages had been abandoned.[35]

Without the unity or political clout of the Mennonites, other groups settled within the framework of the Dominion Lands Act and thus had a dispersed pattern of settlement, with the single isolated farm as the norm. Unable to recreate the villages of their homelands, peoples such as the Icelanders, Ukrainians, Romanians, Belgians, and Ontario British still brought their material culture into Manitoba and expressed it in the landscape, most obviously in churches, cemeteries (Case Study 8.3 on page 122), farmhouses, agricultural buildings, and, in the early years at least, fence types and agricultural practices.[36]

The extent of cultural transfer varied between and within groups. The remoter and agriculturally poorer areas were less exposed to the forces of assimilation and modernity, hence the cultural landscapes of those who settled such areas retained a distinctive appearance longer than those in more prosperous areas. In the Stuartburn area of southeastern Manitoba, for example, Ukrainian farmers in the more isolated easterly areas of settlement around Sirko and Sundown were slower to replace or remodel farm buildings than those who farmed in the western area of Ukrainian settlement around Tolstoi and Rosa.[37] The extent of the area occupied by the group also played a role, as did the group's internal linkages, which were often a function of chain migration.

The Icelandic cultural landscape, whether in the Interlake or in southwestern Manitoba, does not possess the striking signature of the Ukrainian, Romanian, or Mennonite cultural landscapes. The reasons for this are debatable, but probably hinge on the propensity of the Icelanders to assimilate into Anglo-Canadian life and on the greater environmental difference encountered by this group in its migration to Manitoba. The Ukrainians were able to build as they had in the "old country" without more than minor changes, mainly substitution of materials. In contrast, the Icelanders experienced a dramatic environmental change and had to learn new construction methods. They were thus greatly influenced by mainstream Canadian conventions, and the expression of identity in Icelandic building is muted and subtle.[38]

Within ethnic groups there are significant differences in landscape, possibly reflecting geographical positioning within the province. For example, there are differences between the two Mennonite reserves. In the East Reserve there are no recognizable Mennonite *strassendorfer* and surviving traditional Mennonite house-barns are very rare, whereas in the West Reserve there are about 19 villages (Figure 7.3.3 on page 107) and examples of traditional architecture are fairly common (Figure 7.3.4 on page 107).[39] On the other hand, chain migration and some religious antagonism led to the geographic separation between Ukrainians from Galicia and those from Bukovina in many Ukrainian areas of settlement, and to the evolution of subtle differences in their respective landscapes.[40]

CONCLUSION

Recurring themes emerge from the study of the geography and history of settlement and the development of cultural landscapes in Manitoba. Most important, I think, there is a need to recognize the complexity of the settlement process and the diversity of factors that affected it. It is too easy to explain the behaviour of a group on the basis of one element alone, whether it be the physical environment, the group's appraisal of that environment, or simple proximity to a transportation route. Pioneer immigrants were not so different from ourselves in their desire to be with friends and neighbours, even if it meant that some economic cost had to be borne. Chain migration is not a phenomenon of the past. It helped shape the geography of Manitoba between 1870 and the effective close of settlement in 1914, just as it is now shaping the social geography of the large metropolitan areas that are receiving the immigrants of the 1990s.

Immigration is a controversial topic today, just as it was at the time of the settlement of Manitoba. What kind of immigrants are best for the country? Should the government be able to direct them into specific areas? How should they be integrated into the social and economic fabric of the nation? These questions were asked then and are still being asked today. In the 1890s, immigration and settlement were deeply emotional and highly politicized issues. It would be foolish to try to fully understand the course of settlement without appreciating the political and social milieux of the day.

The Dominion Lands Act of 1872 established the framework for the settlement of most of Manitoba. Its regulations shaped the society of most of the province and determined the look of the land. The few exceptions to the rule, where exemptions or special privileges allowed distinctive landscapes to emerge, can blind us to the fact that uniformity and the sectional survey were the norm. Similarly, the easy identification of certain groups who occupied discrete areas or left powerful signatures in the landscape can diminish our appreciation of others, less visible or less numerous, who also played important roles in the agricultural settlement of the province.

NOTES

1. A. Morris, *The Treaties of Canada with the Indians of Manitoba and the North-West Territories Including the Negotiations on which They Were Based, and other information relating thereto* (Toronto: Belfords, Clarke and Co., Publishers, 1880), 314–5.
2. C. Martin, *Dominion Lands Policy,* Vol. 2 of *Canadian Frontiers of Settlement,* ed. W.A. Mackintosh and W.L.G. Joerg (Toronto: Macmillan Company of Canada, 1938); and J.M. Richtik, "The Policy Framework for Settling the Canadian West 1870–1880," *Agricultural History* 49, 4(October 1975):613–28. For the legal details and changes to the Dominion Lands Act, see K.N. Lambrecht, *The Administration of Dominion Lands 1870–1930* (Regina: Canadian Plains Research Center, 1991).
3. Lambrecht, *Administration of Dominion Lands,* 23.
4. The "hamlet clause." Clause 37 of the Dominion Lands Act permitted associations of 10 or more settlers who desired to group their houses together to form a settlement to fulfil their cultivation obligations on their own homestead while residing in a hamlet or village. The clause was amended in 1898 to facilitate cooperative farming by allowing the cultivation of parcels of land set aside for that purpose to be accepted in lieu of cultivation on the actual homestead for which patent was being applied. Lambrecht, *Administration of Dominion Lands,* 109–10.
5. Martin, *Dominion Lands Policy,* 264–70.
6. Ibid., 269.
7. J.L. Tyman, *By Section, Township, and Range: Studies in Prairie Settlement* (Brandon: Assiniboine Historical Society, 1972), 94–5.
8. A.S. Morton, *History of Prairie Settlement,* Vol. 2 of *Canadian Frontiers of Settlement,* ed. W.A. Mackintosh and W.L.G. Joerg (Toronto: Macmillan Company of Canada, 1938), 54–9. See also J.M. Richtik, "Hungarian Settlements in Western Canada in the 1880s," *Proceedings of the Prairie Division, Canadian Association of Geographers,* ed. M.R. Wilson (Saskatoon: Department of Geography, University of Saskatchewan, 1992), 103–17.
9. Morton, *History of Prairie Settlement,* 49.
10. On the Mennonite settlements in Manitoba, see J. Warkentin, "Mennonite Agricultural Settlements of Southern Manitoba," *Geographical Review* 49(1959):342–68; F.H. Epp, *Mennonites in Canada 1786–1920: The History of a Separate People* (Toronto: University of Toronto Press, 1974), 209–30; R.K. Loewen, *Family, Church and Market: A Mennonite Community in the Old and New Worlds, 1850–1930* (Toronto: University of Toronto Press, 1993), 69–91, 131–63; and C.A. Dawson, *Group Settlement: Ethnic Communities in Western Canada,* Vol. 7 in *Canadian Frontiers of Settlement,* ed. W.A. Mackintosh and W.L.G. Joerg (Toronto: Macmillan Company of Canada, 1938), 95–171.
11. B.G. Vanderhill and D.E. Christensen, "The Settlement of New Iceland," *Annals of the Association of American Geographers* 53(September 1963):350–63.
12. Ibid., 357.
13. Ibid., 359.
14. Morton, *History of Prairie Settlement,* 57–8; T.R. Weir, "Pioneer Settlement of Southwest Manitoba," *Canadian Geographer* 8, 2(1964):64–71; and J. Warkentin and R.I. Ruggles, *Historical Atlas of Manitoba, A Selection of Facsimile Maps, Plans and Sketches from 1612 to 1969* (Winnipeg: Manitoba Historical Society, 1970), 307–34.
15. Tyman, *By Section, Township, and Range,* 85–9, 117.
16. C. Sifton (1861–1929) was a Brandon lawyer and Liberal Party politician. From 1888 until 1896 he was the MLA for Brandon, serving as Manitoba's Attorney General and Minister of Education for the last five years. In 1896 he entered federal politics and held the seat for Brandon for the Liberal Party until 1911. He served as Minister of the Interior and Superintendent of Indian Affairs in Sir Wilfrid Laurier's government from 1896 to 1905. His immigration policies were vigorous and radical, aimed at achieving the rapid settlement of the Canadian West without undue regard for the ethnic origins of prospective settlers. On Sifton's policies, see D.J. Hall, *Clifford Sifton: The Young Napoleon 1861–1900* (Vancouver: University of British Columbia Press, 1981), 128–33, 253–69; and D.J. Hall, "Clifford Sifton: Immigration and Settlement Policy, 1896–1905," in *The Settlement of the West,* ed. H. Palmer (Calgary: University of Calgary Press, 1977), 60–85.
17. C. Sifton, "The Immigrants Canada Wants," *Maclean's Magazine* 16(1 April 1922):33–5.
18. V.J. Kaye, *Early Ukrainian Settlements in Canada 1895–1900: Dr. Josef*

Oleskow's Role in the Settlement of the Canadian Northwest (Toronto: University of Toronto Press, 1964).

19. Ibid., 3–18; and J. Oleskow, *O Emigratsii (On Emigration)* (L'viv, Galicia: Michael Kachkowskyi Society, 1895).
20. J.C. Lehr, " 'The Peculiar People,' Ukrainian Settlement of Marginal Lands in Southeastern Manitoba," in *Building Beyond the Homestead: Rural History on the Prairies,* ed. D.C. Jones and I. MacPherson (Calgary: University of Calgary Press, 1985), 29–46.
21. J.C. Lehr, "Peopling the Prairies with Ukrainians," in *Canada's Ukrainians: Negotiating an Identity,* ed. L. Luciuk and S. Hryniuk (Toronto: University of Toronto Press, 1991), 20–52; and J.M. Richtik, "Manitoba Settlement: 1870 to 1886" (Ph.D. thesis, University of Minnesota, 1971).
22. J.M. Richtik, "Chain Migration Among Icelandic Settlers in Canada to 1891," *Scandinavian-Canadian Studies* 2(1986):73–88.
23. J.C. Lehr, "Kinship and Society in the Ukrainian Pioneer Settlement of the Canadian West," *Canadian Geographer* 29(1985):207–19.
24. J.C. Lehr, "The Government and the Immigrant: Perspectives on Ukrainian Block Settlement in the Canadian West," *Canadian Ethnic Studies* 9(1977):42–52; and "Government Coercion in the Settlement of Ukrainian Immigrants in Western Canada," *Prairie Forum* 8(1983):179–94.
25. J.C. Lehr and D.W. Moodie, "The Polemics of Pioneer Settlement: Perspectives on Ukrainian Immigration from the Winnipeg Press, 1896–1905," *Canadian Ethnic Studies* 12(1980):88–101.
26. Y. Katz and J.C. Lehr, "Jewish Pioneer Agricultural Settlements in Western Canada," *The Journal of Cultural Geography* 14(Fall/Winter 1993):49–68.
27. J.M. Richtik and D. Hutch, "When Jewish Farmers Farmed in Manitoba's Interlake Area," *Canadian Geographic Journal* 95(August/September 1977):32–5.
28. Katz and Lehr, "Jewish Settlements," 63–8. A *shohet* is a ritual slaughterer, without whom a Jewish community could not supply itself with kosher meat.
29. Ibid.
30. Morton, *History of Prairie Settlement,* 45–8; and J.M. Richtik, "Manitoba: Population and Settlement in 1870," *I.G.U. Southern Prairies Field Trip, Background Papers* (Regina: University of Saskatchewan, Regina Campus, 1972), 39–40.
31. A.I. Silver, "French Canadian and Prairie Settlement 1870–1890, French-Canadian Attitudes Toward the North-West and North-West Settlement 1870–1890" (M.A. thesis, McGill University, 1966); R. Painchaud, "French Canadian Historiography and Franco-Catholic Settlement in Western Canada, 1870–1915," *Canadian Historical Review* 59, 4(1978):447–66; and K.J. Ross, "French Canadian Settlement in Manitoba" (B.A. thesis, University of Winnipeg, 1983). For details of individual French settlements in Manitoba, see Dawson, *Group Settlement,* 335–76; and D. Frémont, *Les Français dans l'Ouest Canadien* (Winnipeg: Les Éditions de la Liberté, 1959).
32. Ross, "French Canadian settlement," 30–1.
33. C. Douchant and J.M. Richtik, "Belgian Migration to Manitoba to 1930," in *Reflections from the Prairies: Geographical Essays,* ed. H.J. Selwood and J.C. Lehr (Winnipeg: Department of Geography, University of Winnipeg, 1992), 26–40.
34. J. Warkentin, "Manitoba Settlement Patterns," *Transactions Historical and Scientific Society of Manitoba,* Series III, no. 16 (1961), 62–77.
35. Warkentin, "Mennonite Agricultural Settlements," 365; and Epp, *Mennonites in Canada,* 227–9.
36. E.M. Ledohowski and D.K. Butterfield, *Architectural Heritage: The MSTW Planning District* (Winnipeg: Department of Culture, Heritage and Recreation, Historic Resources Branch, Province of Manitoba, 1983); G.E. Dowsett, "The Vernacular Architecture of Three Ethnic Groups in Manitoba: A Comparative Analysis" (M.A. thesis, University of Manitoba, 1984); J.W. Darlington, "The Ukrainian Impress on the Canadian West," in *Canada's Ukrainians: Negotiating an Identity,* ed. L.Y. Luciuk and S. Hryniuk (Toronto: University of Toronto Press, 1991), 53–80; and J.C. Lehr, "Ukrainians in Western Canada," in *To Build in a New Land: Ethnic Landscapes in North America,* ed. A.G. Noble (Baltimore: Johns Hopkins University Press, 1992), 309–30.
37. This assertion is made on the basis of a survey of the vernacular architecture of Ukrainian settlers in the Stuartburn area of southeastern Manitoba undertaken by the author for the Canadian Museum of Civilization in 1974–75.
38. E.M. Ledohowski and D.K. Butterfield, *Architectural Heritage: The Eastern Interlake Planning District* (Winnipeg: Department of Cultural Affairs and Historic Resources, Province of Manitoba, 1983); and Dowsett, "Vernacular Architecture."
39. A.G. Noble, "German-Russian Mennonites in Manitoba," in *To Build in a New Land: Ethnic Landscapes in North America,* ed. A.G. Noble (Baltimore: Johns Hopkins University Press, 1992), 268–84; Ledohowski and Butterfield, *Architectural Heritage: The Eastern Interlake Planning District,* and Dowsett, "Vernacular Architecture."
40. J.C. Lehr, "The Landscape of Ukrainian Settlement in the Canadian West," *Great Plains Quarterly* 2(1982):94–105.

Case Study 7.1
The Township and Range Survey System

James M. Richtik

The long-lot survey system of the Red River area was accepted in 1869 and confirmed by the Manitoba Act, 1870. However, in 1869 the Minister of Public Works, William McDougall, sent Colonel J.S. Dennis to find a system more attuned to the needs of Ontario farmers, who were expected to be the first and most desirable settlers.

McDougall suggested that the American system, but with larger sections, would be the most suitable, and Dennis, after talking to various Americans on the way west, agreed. The American square survey was to be used, but sections would be increased from 640 to 800 acres so that each quarter section would be 200 acres, the normal size for Ontario farms.[1] The townships would contain 64 sections rather than the American 36, so they would also be large enough to serve as local government units.

Because of the difficulties that arose in the United States when land was taken back from farmers to create a road system, Dennis recommended retaining road allowances around each section. He also recommended maintaining the long lots of the existing settlers, but confrontations occurred because his surveyors ran base lines across the long lots in St. Vital. The Métis under Louis Riel forced the surveyors to abandon their work, and the Riel uprising that followed caused surveying to be discontinued until 1871.

When Dennis resumed surveying in 1871, he used a system much closer to the American one. The Honourable J. Archibald, Manitoba's lieutenant-governor, had agitated for the American-sized townships and sections and no road allowances. This reflected his belief that many settlers would be from the United States and that emigrant classes around the world were already familiar with the American system.

Archibald also argued that smaller sections and no land wasted on road allowances would allow significantly

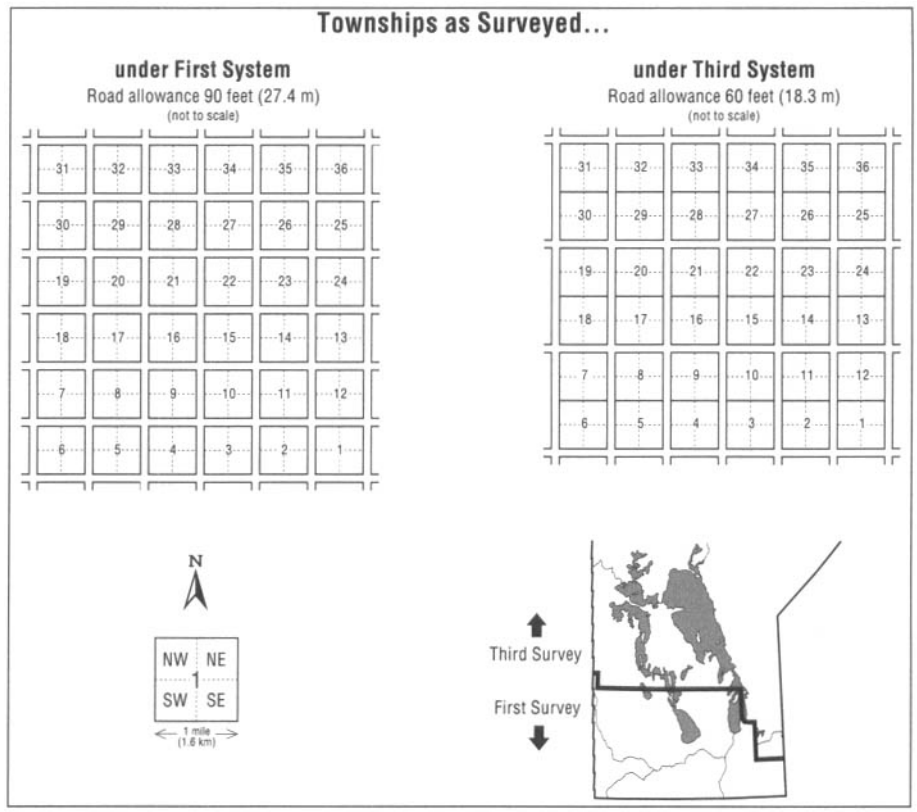

Figure 7.1.1 Townships as Surveyed under the First System and the Third System

more homesteads on the same amount of land. As a result of his efforts, the new section size was 640 acres with 160-acre quarter sections, and sections were arranged in townships of 36 sections — the American system. However, the Canadian system included 99-foot road allowances around each section, and started the numbering of sections from the southeast rather than the northeast corner of the township (Figure 7.1.1). Townships were numbered north from the American border and in ranges east and west from the principal meridian, which was located just west of Winnipeg at 97°27'28.4"W.

Because the eastern and western boundaries of townships are meridians (true north and south), they converge northward, and the system had to take this into account. At the 49th parallel, the southern edge of each township is six miles plus six 99-foot road allowances. The northern edge of the township is about 61 feet shorter, and the northern edge of the second township is an additional 61 feet shorter. To adjust for this convergence, a new base line was added at the northern edge of Township 2, and the southern edge of Township 3 was made approximately 112 feet longer than at the 49th parallel. This means that at the northern edge of Township 4, the township is the same length as at the 49th parallel, and at the northern edge of Township 6, it is once again 112 feet shorter.

This pattern was repeated every four townships north. Thus there are correction lines between Townships 2 and 3 and between Townships 6 and 7, where north-south roads jog westward by 224 feet at the western edge of range 1W. At the western edge of range 2W, the size of the jog is doubled, and it increases by about 224 feet every range westward. Thus, at the Saskatchewan border the jog is well over a mile and is expressed in the stepped border between the two provinces (Figure 7.1.2). Within the townships, all sections are the same size except those along the western edge of the townships, where the differences are all accommodated in the most westerly quarter sections.

Most of southern Manitoba was surveyed under the first survey system, but in 1881 two new systems

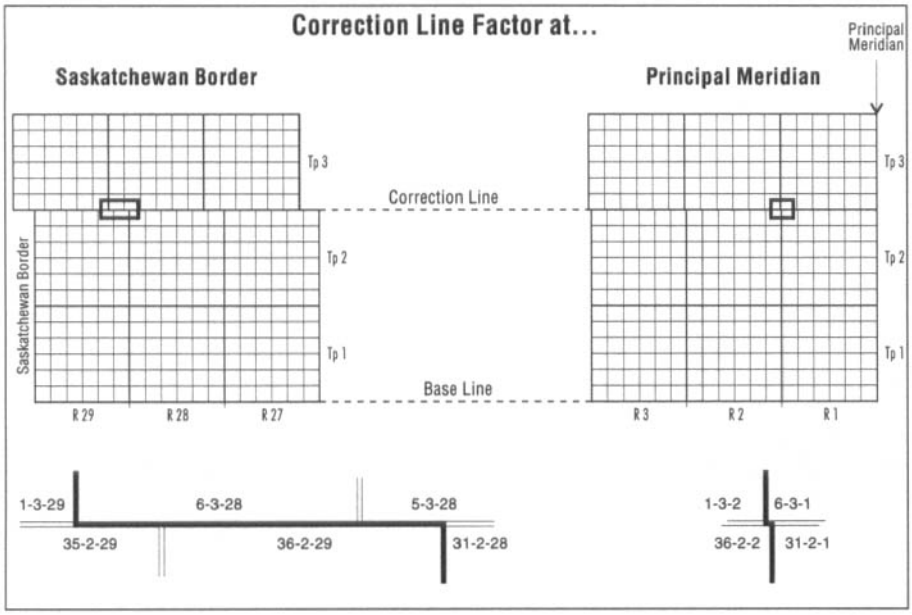

Figure 7.1.2 The Effect of Correction Lines on the Landscape of Southern Manitoba

were introduced. Only the third system was used in Manitoba (Figure 7.1.1). Road allowances were reduced from 99 to 66 feet, and every second east-west road was eliminated. This significantly reduced the amount of land devoted to roads, and produced slightly smaller townships and a need for some adjustments where the two systems met.

The net effect of the surveying system was to disperse settlement and produce a checkerboard pattern in agricultural areas (Figure 7.3.3 on page 107). The ubiquity of roads permitted houses to be anywhere on the edge of a section and still be next to a road, and the use of the quarter section as the standard unit of land ownership furthered dispersion. Field patterns were constrained by the square boundaries of ownership, and further ensured by the presence of road allowances. Even today the dominant image of southern Manitoba from the air is the rectilinear pattern of fields and the grid of roads.

NOTES

1. Imperial measurements are used throughout this case study, because these units were used at the time and conversion to the metric system produces some cumbersome numbers.

Case Study 7.2
Asessippi: A Colonization Company Town

David McDowell

The family in the buggy (Figure 7.2.1) have just descended the steep Shell River valley side. Here at Asessippi (from the Cree for Shell River), they overlook a flourishing village, with the sounds of a sawmill in action, the gentle thump of the turbine at the grist mill, and the jangle of harness as another team leaves the store to wend its way up the slope of the benchland to the west.

Today, a visitor at the same spot on the east bank of the Shell River would see rusting bridge girders in the stream bed; across the stream, a boarded-up home that had been the hotel, with a few decaying homes behind it; and, on the hill to the south, the same Victorian-style farm home seen in that early picture. But the only sounds would be of crickets, a bee buzzing by, and the harsh caw of a crow interrupting the burble of the river and the general silence. In the distance there might be the roar of transport trucks on Highway 83, labouring up the steep hill to the east of the former town of Asessippi (Figure 7.2.2).

How did the bustle and euphoria of the 1880s become the ghost town of today? In microcosm it is the settlement story of many western hamlets and villages. Under the Dominion Lands Act of 1872, there was to be a family on every 160 or 320 acres (64.75 or 129.5 ha) in a block pattern across the West. By the early 1880s, however, the pattern was changing, as settlements sprang up at trail intersections and along the new railway lines being laid across the region. Boomtown fever saw many "Chicagos of the North" platted[1] and promoted, but very few of them became reality. At a river crossing, with its citizens expecting rail service at any time, was Asessippi, a good example of a colonization company town.

The Colonization Company Act of 1881 sought to stimulate settlement by allowing groups of investors to gain land at half price in alternating sections, in return for financing and placing settlers who would stay for five years and improve the land. Under this provision the Shell River Colonization Company, formed by Messrs. Wm. Jeffs, E.G. Fralech and Associates of Trenton and Belleville, Ontario, were allocated three townships on the Shell River, at its junction with the Assiniboine River. Townships 23 and 24, Range 28, W1, and Township 23, Range 29, W1, seemed at first glance to be well suited to agriculture, well drained and near the proposed "Assiniboine Branch" of the Canadian Pacific Railway. By November 1893, 51 settlers had located there, albeit not all with the support of the company.

Asessippi was constructed at a site with an "ample and never failing water power for milling"[2] on NW 3-23-28, W1 (Figure 7.2.2) by the company under the supervision of Henry Gill and James Richardson. They formed the Asessippi Milling Company and invested $25,000 in a dam across the river, along with a roller-process grist and flour mill, the works for which had been brought across the country from railway

access at Moosomin. To this they added a planing mill and shingle factory, all near a wooden bridge. The Fort Pelly Trail that ran north to Boggy Creek was rerouted over it. A "pump and cabinet factory" was also set up. The company secured a timber limit on the Shell River where it drained the Duck Mountains, and logs were floated down to Asessippi to be turned into lumber.

Soon there was a store/post office, whose second storey served as a church and meeting hall. Nearby, the families set up a blacksmith shop, a boardinghouse, and a number of private dwellings. The Inspector of Colonization Companies was impressed with the company's apparent concern for the material well-being of its settlers.

Community spirit and social activity flourished. By 1887 the Asessippi River Curling Club provided winter sport on the frozen Shell River. While awaiting standard curling rocks, they used wooden curling rocks with iron handles fashioned by the blacksmith. The store was a favourite gathering spot for catching up on news, and socials were held in the homes of the settlers. Church services were held in turn for Catholics, Presbyterians, Anglicans, and Methodists, with all attending and taking the service if a minister was not available.

But by the late 1880s the town's prospects began to deteriorate. For lack of experience and capital, some settlers did not cultivate the land well, and drifted off to nearby hamlets that had railway service, such as Russell (which got its rail connection in 1886) and Shellmouth. Also, the Shell River Colonization Company got into a dispute with the newly established municipality of Shell River over taxation, and by October 1888 the company accounts were closed by the Department of the Interior. The settlers struggled on alone.

Some prospered, raising cattle and grain, and D.T. Wilson's horses won prizes at the Winnipeg Exhibition. A brick works and cheese factory were tried for a short time. In 1893 a school was erected at the top of the hill east of Asessippi, and in 1896 a church was built by volunteer labour for the Methodists and Presbyterians.

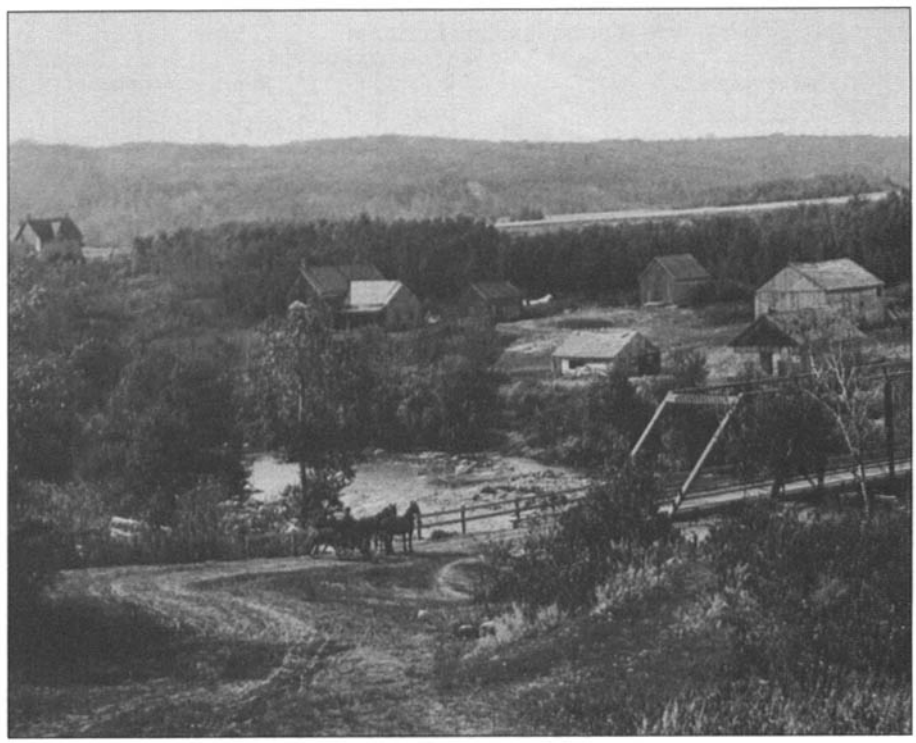

Figure 7.2.1 Asessippi on the Shell River in the Early 1890s (Photographer unknown)

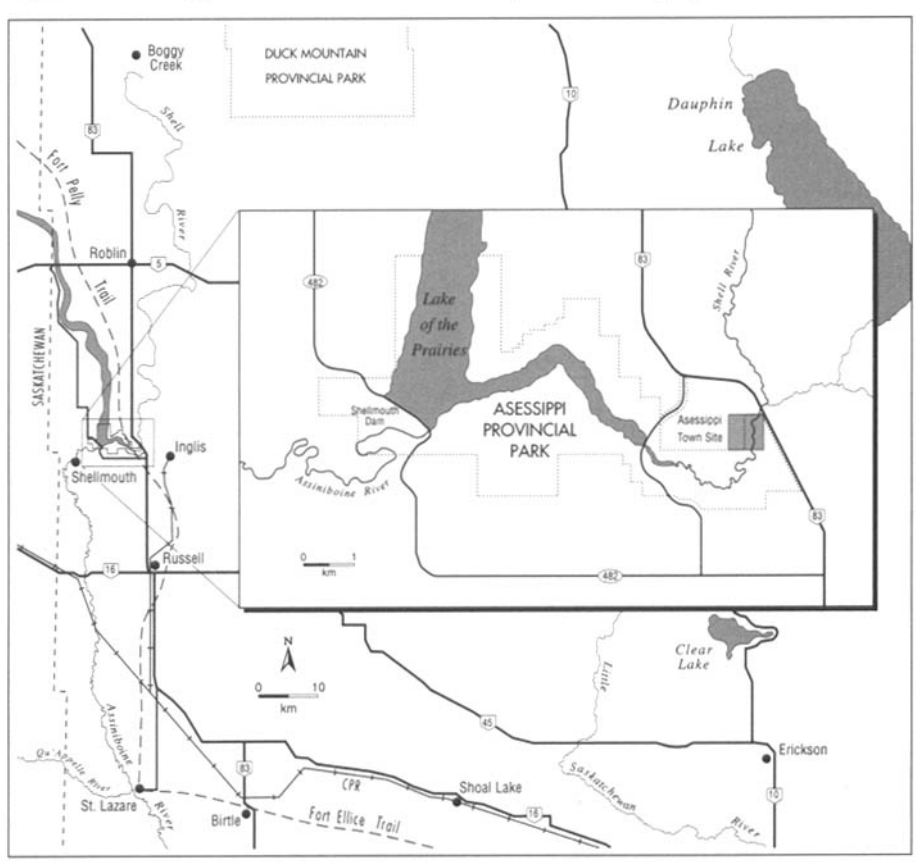

Figure 7.2.2 The Location of Asessippi

It was later moved to Inglis, after rail service arrived there in 1922 (the closest that rail service got to Asessippi).

But early frosts took their toll, and the lack of a railway cut down the profitability. One farmer complained that only the gophers had fared well on his crops. The sawmill lost out to the prosperous sawmill activity

Figure 7.2.3 An Abandoned House (the Worley-Thring House) at Asessippi (Photograph: D. McDowell)

centred in Brandon. The flour mill suffered from competition, transportation difficulties, and the lack of a steady water supply, despite the earlier bold assessment of its value! Spring ice damaged the dam several times, and a runaway log drive finally destroyed it for good in 1911. Thomas McLennan, who had bought the store and mill from the Gills, struggled on until 1914. By then the site was occupied by just a couple of farm families.

After World War II the provincial system of paved highways provided better transportation. People showed an interest in a park at the Shellmouth reservoir, part of the upper Assiniboine flood control plan (Case Study 18.2 on page 283). The park area stretched east up the Shell River to Highway 83, encompassing the old Asessippi townsite. Unfortunately the steel bridge erected in 1893 to replace the original wooden one (Figure 7.2.1) was damaged just as the park was being created, and plans to recreate the historic town took second place to the development of an excellent campground at the Shellmouth dam, about 5 km to the west.

Today the foundations and remaining buildings (Figure 7.2.3) offer mute testimony to the pioneer spirit and building styles of the settlers who came west under the colonization company scheme. Someday we may even be able to step back into their time at a historic village on those foundations, and experience what life was like in the 1880s.

NOTES

1. "Platted" means to lay out in a grid fashion to enable the disposal of land for the purposes of a town.
2. Public Archives of Canada, R.G. 15, 656000, Report of Inspector Stephenson, 1 November 1883.

Case Study 7.3
Mennonite Reserves
James M. Richtik

In 1872 the Canadian government began offering reserves to European ethnic groups who might be prepared to settle in western Canada. The first offer was to a Swiss group who showed no interest. However, the Mennonites in Russia were at that time threatened with the loss of their special privileges, and sent a delegation to tour Canada and the United States. Canada offered land reserved exclusively for them, freedom from military service, and the right to live in villages while fulfilling homestead duties – none of which were offered by the United States. As a result, some of the Mennonites chose Manitoba as their destination.

Two reserves were created for the Manitoba Mennonites (Figure 7.3.1). The first, which became the East Reserve, was east of the Red River and about 30 km south of Winnipeg. It was chosen by Canadian government agents, and the Mennonites accepted only reluctantly because the road approaches were flooded and much of the soil seemed poor. Large numbers of settlers began arriving in 1874, but the next year some went directly to a well-drained area west of the Red River and 100 km south of Winnipeg. In 1876 the latter became part of the West Reserve, and soon all new settlers went there. By 1879 many had even abandoned the East Reserve to move to the new reserve.

The Mennonites came from villages in Russia in which the old three-field system of Medieval Europe was still practised. When they arrived in Manitoba, they attempted to maintain the system with which they were so familiar, and which the church favoured as a better way of maintaining community. Each homesteader signed the village's agreement to share the land, even though the official title for each quarter section belonged to an individual. A village was established in which each settler was allocated a narrow plot of land running back from the main village street (Figure 7.3.2). The plot was to provide space for a house, barns, and a garden, and overnight space for cattle. The remainder of the homestead land belonging to the villagers was divided into three equal

parcels plus a slightly larger one for pasturage.

Each villager was given a strip of land in each of the three fields for his personal use, so that all the land in each field was allocated. This not only preserved the old village pattern of land use but helped assure equal land quality for all settlers. In the early years, neither pasture nor fields were fenced; the village included a herdsman, whose task was to look after the cattle during the day and keep them out of the fields.

Some of the villages began to disintegrate almost at once, and the majority of them disappeared (Figure 7.3.1). All individuals made homestead entry for a specific quarter section of land within the village, and could legally withdraw their land from the cooperative ownership. This would require reallocation of lands within the village, or, if enough people left, complete abandonment of cooperative ownership. This happened first on the East Reserve when some left for the West Reserve. Later, some Mennonites mortgaged or even sold their quarter sections, withdrawing the land from the village allocation system. This encouraged others to withdraw as well.

As members of the villages purchased individually owned machinery, there was greater dissatisfaction with the land allocation, and in some instances the village made a common decision to use individual lands. In time, some farmers whose lands were at greater distances from the village found it more economical to move to the individual plots, further weakening the village system. Many of the migrants from the East to the West Reserve never formed new villages.

The original land distribution was maintained longest by the more conservative group south of Winkler. However, provincial legislation in 1919 required English instruction in the schools, and many of this group left for Mexico and Paraguay, fearing further loss of rights and culture. Although the village lands were sold to new Mennonite immigrants from Russia, the newcomers operated farms as individual properties from the beginning. Nonetheless, these are the best-preserved villages today (Figure 7.3.3).

Mennonite buildings were also

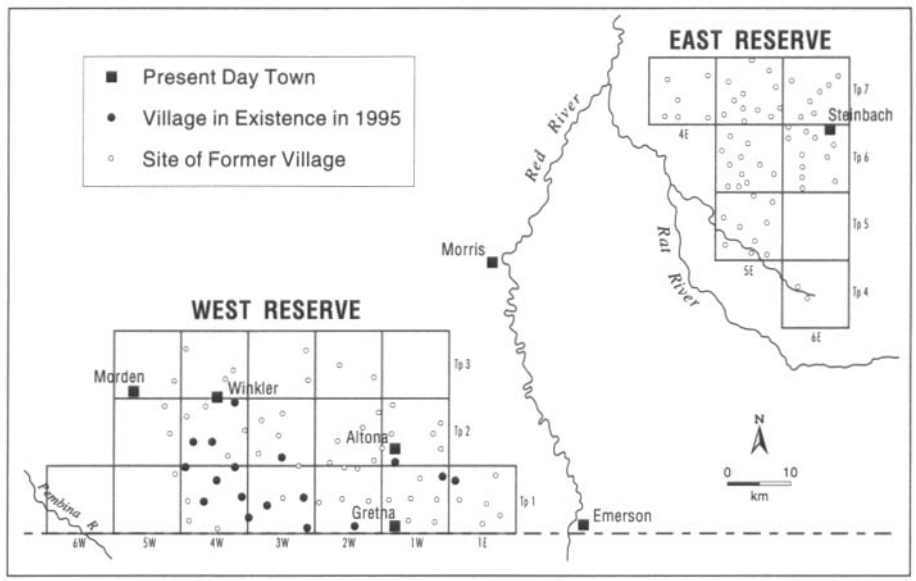

Figure 7.3.1 The East and West Mennonite Reserves in Southern Manitoba

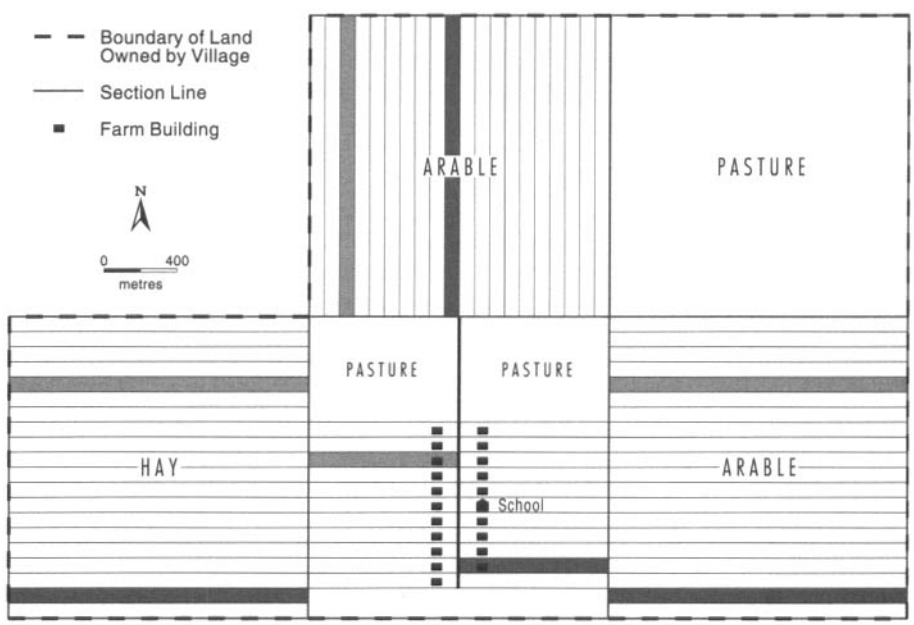

Figure 7.3.2 The Three-field System of Land Division Practised by the Mennonites

distinctive. Barns were attached to the houses, gables in line, usually stretching back from the village road (Figure 7.3.4). This style continued in general use only briefly, and in the early 20th century the detached barn gradually became the norm for new buildings.

The Mennonites had reason to fear loss of culture. In the 20th century more and more Mennonites have left rural areas; at the same time, most have become English-speaking, even in religious services. Others have converted to other religions or have become nonreligious, and today many people whose ancestors were Mennonites cannot be distinguished except by their surnames.

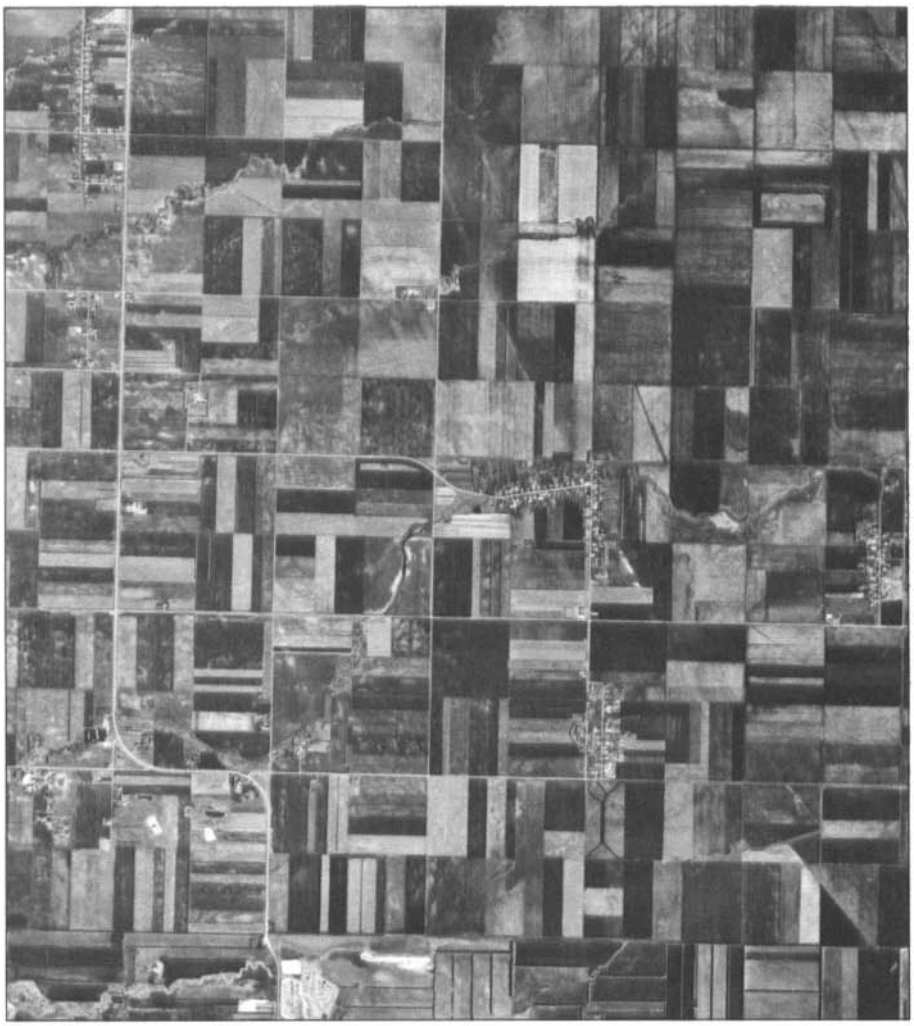

Figure 7.3.3 Four Villages (Hochfeld in the northwest, Reinland in the centre, Rosengart in the south, and Schoenwiese in the east) within the west Mennonite reserve in township 1, ranges 3 and 4, W1. The light-toned area running diagonally across the photograph is a Lake Agassiz strandline. North is at the top of the photograph and the international border runs along the southern edge. (Photograph: MAPL, MB 90019-44)

Figure 7.3.4 A Mennonite Combined House and Barn. Most of the features are virtually identical to those on some of the Mennonite buildings in Russia. (Photograph: J. Richtik)

POPULATION OF MANITOBA: PATTERNS AND TRENDS

8

C. Emdad Haque

The study of the population of an area includes examination of population dimensions such as size and structure, temporal growth, and spatial distribution. All play important roles in formulating planning strategies, because the current and future demand for goods and services, labour supply to the market, and the state of housing, transportation, and communication infrastructure are all profoundly affected by demographic features. Historically, the interplay of economic, political, social, and cultural variables has affected the temporal and spatial changes in Manitoba's population. These demographic changes have, in turn, also profoundly affected the province's landscapes, economic growth, and social, cultural, and political characteristics.

In a territory of 649,950 km^2 of the Prairie and the Canadian Shield,[1] Manitoba in 1991 had a population of 1,091,942 (Table 8.1). Although this accounted for only 4 percent of the Canadian total, it ranked fifth among the provinces and territories. Manitoba's share of the national total has declined gradually without any noticeable fluctuation from this trend over the last hundred years. But population growth in Manitoba has varied over time and in geographical distribution. This chapter is primarily concerned with recent trends in population growth and distribution, and their implications for regional economic development. However, an overview of historical trends is included as a prelude to the current situation.

PATTERNS IN EARLY POPULATION GROWTH: A PRELUDE

The early colonization of Rupert's Land by Upper Canadian and European people began with the fur trade and was continued at the initiative of Lord Selkirk. By the 1850s, the new settlements accounted for more than 10,000 persons along the Red and Assiniboine rivers (Chapter 6).[2]

During the last quarter of the 19th century, immigrants to the new province increased progressively, coming mainly from Ontario and the United States.[3] However, the number of farmers from these areas, primarily of British-Protestant background, was not enough to meet the expectations of the Dominion government. Consequently, French from Quebec, Mennonites from Russia, and Icelanders, along with many others, received special attention and encouragement from the government to settle on the Prairies. As a result of the arrival of tens of thousands of immigrants with a variety of ethnic backgrounds, Manitoba's population surged to over 150,000 within two decades of its joining Confederation.

The increase continued in the first two decades of the 20th century: from 255,211 in 1901 to 610,118 in 1921 (Table 8.1). As Canada's national immigration policy was liberalized due to economic needs before World War I, the number of immigrants to this province steadily increased. Most of the province's arable land was taken up between 1896 and 1914 (Chapter 7). Simultaneously, the population inflow acted as a catalyst to Winnipeg's immigrant-based economy. Between 1901 and 1913, the city grew from 42,000 to over 150,000,

and for the first time one-third of the provincial population lived in Winnipeg.

The 1930s and early 1940s were disappointing for Manitoba in terms of environmental, economic, and demographic conditions. Crop failures, the collapse of the Manitoba Co-operative Wheat Producers, and the waves of the Great Depression created an economic crisis with massive unemployment and declining wages, particularly in the southern farmlands. In response to the adverse economic outlook during the period 1931–41, the federal government took deliberate measures to stop new international immigrants; consequently, Manitoba's population grew by only 4 percent during this period.

The war economy of the early 1940s generated new hope for the province. The increased demand for agricultural products other than grains partially shifted the focus from traditional "King Wheat" to sugar beets, vegetables, and oil-producing crops, and helped the province achieve full employment by 1942. However, the new realities and hopes did not translate into long-term economic expansion with associated population growth.

The war-based industrial boom in Canada was concentrated mainly in Ontario, and the natural-resource richness of British Columbia gave it an advantage over Manitoba. Many young adults were attracted to the new economic opportunities outside the province, and left. Also, the natural population growth was offset by war casualties. This, together with emigration of the young, resulted in only a 6.4 percent population increase between 1941 and 1951 (Table 8.1). In discussing the postwar circumstances, Morton wrote, "it was a province so long braced to endure that it did not find it easy to rejoice in victory or to expect much of the future."[4]

Table 8.1 Population of Manitoba and Canada, 1901–91

	Manitoba		Canada		
Year	Population	% Change	Population	% Change	Manitoba's % of the national population
1901	255,211	-	5,371,315	-	4.8
1911	461,394	80.8	7,206,643	34.2	6.4
1921	610,118	32.2	8,787,499	21.9	6.9
1931	700,139	14.8	10,376,786	18.1	6.7
1941	729,744	4.2	11,506,655	10.9	6.3
1951	776,541	6.4	14,009,429	21.8	5.5
1961	921,686	18.7	18,238,247	30.2	5.1
1971	988,247	7.2	21,568,311	18.3	4.6
1981	1,026,241	3.8	24,343,181	12.9	4.2
1991	1,091,942	6.4	27,296,859	12.1	4.0

Note: Census data for 1871–91 are excluded because of the boundary changes to the province in the late 19th century and because the focus of this study is on the contemporary period.

Sources: Statistics Canada, *Population 1921–1971: Revised Annual Estimates of Population by Sex and Age Group, Canada and the Provinces* (Ottawa: Minister of Industry, Trade and Commerce, 1973); and Statistics Canada, *91 Census: A National Overview — Population and Dwelling Counts* (Ottawa: Minister of Industry, Science and Technology, 1992).

CONTEMPORARY POPULATION STRUCTURE AND TEMPORAL TRENDS

Trends in Population Growth

Since 1931 the population growth rate of Manitoba has lagged behind the national rate (Table 8.1). For example, between World War II and 1991, Canada's population increased by 125 percent; in contrast, Manitoba's population grew by only about 50 percent. In addition, the province's postwar population growth was irregular rather than steady.

The postwar fertility boom and a more liberal immigration policy, especially in accepting refugees from war-affected Europe, contributed to a national population growth of 30.2 percent and a provincial growth of 18.7 percent during the period 1951–61. However, this surge did not last long. The fertility level of the country in general declined below the replacement level throughout the 1970s and 1980s, and in Manitoba the crude birth rate fell from 18.0 in 1971 to as low as 16.0 in 1980.[5]

Several significant social, economic, and geopolitical factors — such as preference for the nuclear family, the economic shock from the Middle East oil crisis in the mid-1970s, the prolonged recession of the 1970s, and setbacks in agriculture resulting from international competition — presented new challenges for Manitoba in keeping its population stable. Emigration, both from farms and from Winnipeg, has become the norm in recent decades. The slow natural increase along with emigration resulted in only a 7.2 percent net increase of population for the period 1961–71, and as little as a 3.8 percent increase for the period 1971–81.

Supported by an economic recovery, the baby boomers have since 1981 reversed the trend of declining fertility. The number of live births increased from 16.1 per thousand in 1981 to 17.0 in 1987.[6] However, this resurgence is unlikely to create long-term overall population growth. Presently, the nuclear-family structure is a well-established norm, and "multiple-member family living" is disappearing rapidly. These factors are likely to keep the overall fertility rate below the replacement level in the future.

It is important to evaluate the demographic situation in the province from a national perspective, because resource allocation by the federal government is influenced by the size of the subnational or regional population and by its future potential. Manitoba's share of the national population has been decreasing consistently in recent decades. In 1941, of a total Canadian population of 11.5 million, three-quarters of a million lived in Manitoba, only 6.3 percent of the Canadian total. Since then, the share has declined in each succeeding decade, reaching a low of only 4 percent in 1991 (Table 8.1).

This trend is primarily the product of two processes. First, a re-

Table 8.2 Manitoba's Population by Age Group, 1941, 1961, 1991

Year	(1) Children (0-14 years)	(2) Adult (15-64 years)	(3) Aged (65 years and over)	(4) Youth Dependency Ratio (1) ÷ (2) x 100	(5) Elderly Dependency Ratio (3) ÷ (2) x 100	(6) Total Dependency Ratio (4) + (5)
1941	26.2	67.6	6.3	38.7	9.2	47.9
1961	32.6	58.4	9.1	55.8	15.5	71.3
1991	22.0	64.6	13.4	34.0	20.8	54.8

Sources: Statistics Canada, *Population 1921–1971: Revised Annual Estimates of Population by Sex and Age Group, Canada and the Provinces* (Ottawa: Minister of Industry, Trade and Commerce, 1973); and Statistics Canada, *Age, Sex and Marital Status: The Nation* (Ottawa: Minister of Industry, Science and Technology, 1992).

structuring in agriculture has been occurring since World War II (Chapter 15), namely, the replacement of labour-intensive farming by capital-intensive mechanization, with a resulting enlargement of farm size. Nationwide there were more than 700,000 farms in 1940 but only 225,000 by 1988.[7] Second, the loss of confidence by the province's business community during the postwar period, accompanied by cautious and relatively passive public-policy strategies, resulted in a much slower pace of economic growth and expansion in Manitoba than in Ontario, British Columbia, and Alberta.

Events such as Alberta's oil-based economic boom in the late 1970s and the recovery of Ontario and British Columbia in the 1980s demonstrated their better economic prospects. In recent decades, while the long-term fertility trend of the Canadian population has remained below the replacement level, additions to the existing population through immigration have played a key role in determining both national and regional population growth. Ontario, British Columbia, and Alberta have succeeded in attracting international immigrants in disproportionate numbers compared with Manitoba; consequently Manitoba has trailed them in population growth.

Population Structure: Age-Sex Composition

Before World War II, about one-quarter of Manitoba's population belonged to the "child" age group (below 15 years of age), and only slightly more than 6 percent belonged to the "aged" group (65 years and over). Because of the postwar baby boom, the child age group expanded to one-third of the population by 1961 (Table 8.2). The increase in fertility level raised the youth dependency ratio (YDR)[8] from 38.7 in 1941 to 55.8 in 1961.

Since the province has always faced a personnel shortage, this trend was very encouraging. The growth pattern during 1941–61, which resulted in a broad-based population pyramid, had a potential for future expansion (Figure 8.1). The general prediction was that when the baby boom cohorts entered the family-raising stage of the life cycle within the next two to three decades (i.e., in the 1970s and 1980s), the base of the pyramid would continue to be relatively broad due to what is known as the "echo effect" of the baby boom.

Noticeably, the broad base of the 1961 population pyramid (Figure 8.1), caused mainly by increased fertility, was accompanied by a continuous aging process due to increased longevity. Between the 1920s and late 1980s, life expectancy at birth for females in the province rose from below 61 years to above 80 years, and for males it increased from below 60 to 73 years.[9] Consequently, the aged population rose to more than 9 percent of the total by 1961. The combined results of increased proportions of children and of aged caused the total dependency ratio (TDR)[10] to escalate from 47.9 in 1941 to 71.3 in 1961 — an alarmingly high total (Table 8.2).

The three decades between 1961 and 1991 followed a somewhat different trend, however. The proportion of the aged population continued to grow, from 9.1 percent in 1961 to 13.4 percent in 1991, as a result of lower mortality rates among the elderly, decline in fertility among the young, and emigration of the young. The process has resulted in an increase in the elderly dependency ratio (EDR)[11] from 15.5 to 20.8 during 1961–91. But as the youths of 1961 are now in the adult age group, the YDR has gone down considerably. Overall, the TDR decreased to 54.8 in 1991, representing a more favourable demographic condition for economic growth. The situation does not auger well for the future, however, as there are fewer youths "coming through."

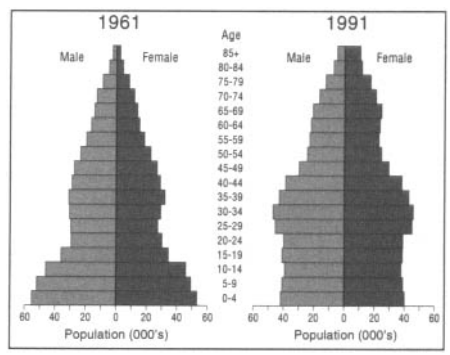

Figure 8.1 Population Pyramids for Manitoba in 1961 and 1991

The economic recession and sociocultural processes inducing postponement of childbearing,[12] together with the new trend towards "solo living" (i.e., one-person households)[13] continued to constrain the level of fertility. The echo effect of the baby boom did not take place until 1989, when after a long wait an increase in the total fertility rate (TFR)[14] was recorded.[15] The overall effect is a much narrower base for the population pyramid in 1991 than in 1961 (Figure 8.1). In this pyramid, the 25–44 adult age group shows a significant increase between 1961 and 1991 attributable to the entry of the baby boomers into the early adult age groups.

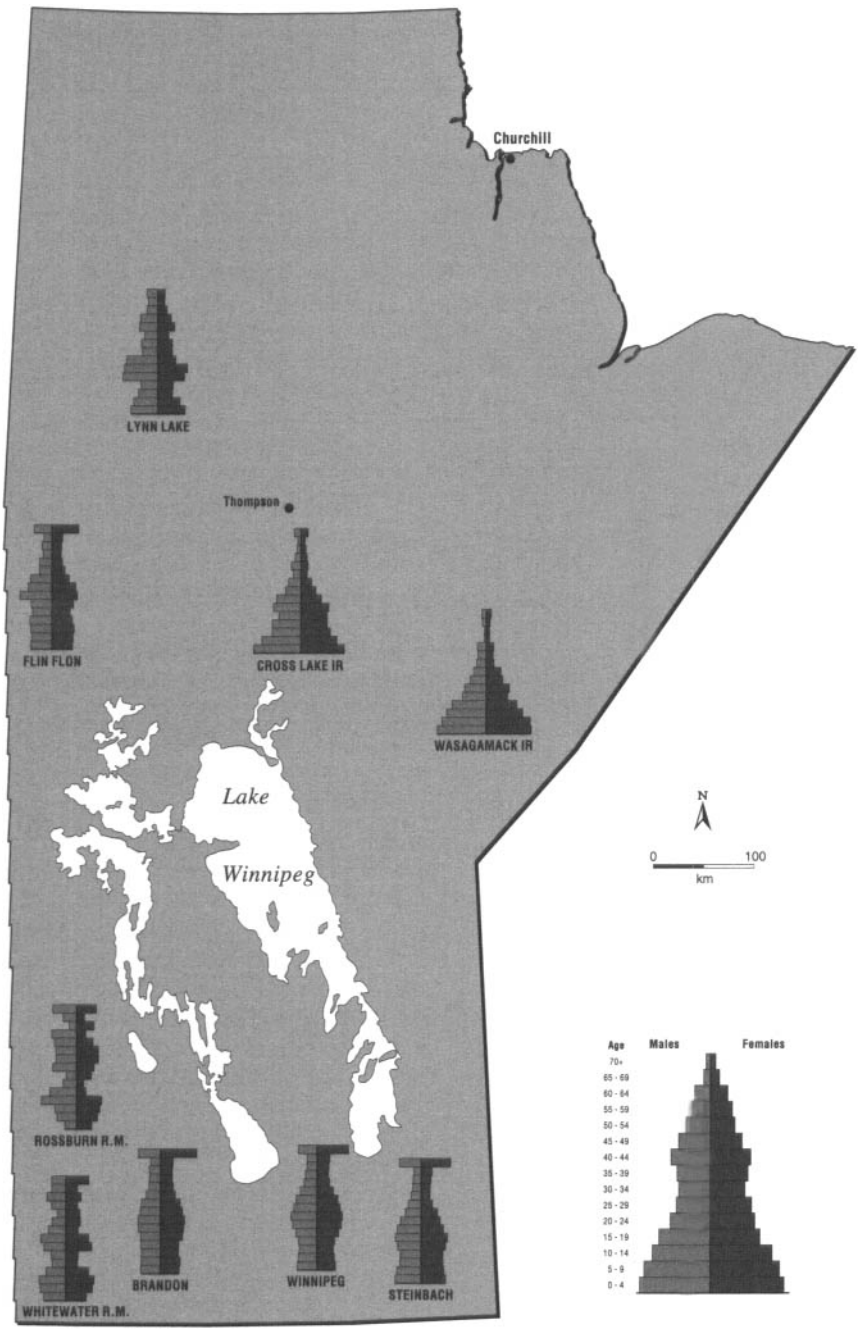

Figure 8.2 Age-sex Pyramids for Some Selected Communities and Areas in 1992 (Source: Compiled from Manitoba Department of Health, Manitoba Health Population Report, June 1, 1992 *[Winnipeg: Manitoba Department of Health, 1993])*

Data from the censuses indicate that not only did the proportion of children (younger than 15 years) decline between 1961 and 1991 but their absolute numbers also decreased significantly. This means that in the coming decades the number of children entering Manitoba's labour force will be much lower than at present, while the proportion of the elderly will expand further, a result of reduced mortality. Such changing demographic conditions will affect all spheres of the economy and society.

So far, this discussion of population age-sex structure has dealt only with the aggregated data for the province as a whole. A closer examination of population structures by different residential areas and communities is worthwhile, as it reveals variations within the province. Four distinct types of population pyramid are discernible in Manitoba (Figure 8.2):

(1) Winnipeg and the other service-based regional centres have an indented base relative to the adult age cohorts. Typically, this type of pyramid evolves when a population experiences a period of rejuvenation and vigorous growth followed by a significant fertility decline. In the case of the urban centres of Manitoba, the pattern is attributed to lower birth rates during the last 20 years compared with the preceding 20 years. The "graying effect" (Case Study 8.1 on page 119) is also apparent in the "top-heavy" pyramids for Winnipeg, Brandon, and Steinbach.

(2) The pyramids for dispersed rural communities indicate the characteristics of a low fertility level, with emigration of the young adult as well as aged cohorts. The population age group 0–4 years is indented relative to other child age cohorts, reflecting a very low fertility rate in these communities. Population age-sex pyramids for both Rossburn and Whitewater rural municipalities have a truncated shape due to aging and to emigration of their adult and aged populations.

(3) The pyramids for northern resource communities, illustrated by the "beehive" pyramids of Lynn Lake and Flin Flon, result from unstable conditions. At Lynn Lake the abrupt inflation of population in the 20–34 age group relative to the age groups below and above indicates considerable immigration of miners and other labourers, chiefly adult males. A similar pattern for the 30–49 age group is apparent in the population pyramid for Flin Flon.

(4) The pyramids for Native bands, illustrated by the Cross Lake and Wasagamack Bands, depict a high fertility level, reflected in their broad base, and a high mortality level, indicated by the steeply sloping sides and the small percentage of aged people.

Changes in the marital status of the population in recent decades have profoundly affected the province's population structure and growth. Before the 1960s, in Manitoba and in other areas of the country, people married at a young average age, commonly in their 20s, and most people got married at some time in their lives.[16] Around the mid-1960s

these situations changed; marriages started occurring later in life, and they began taking place less frequently. This affected the provincial total of married people considerably: in 1961, the percentage of never-married people aged 15 years and over was 20.1 for males and 14.3 for females; in both 1981 and 1991 the figures had risen to 23 for males and 18 for females.

Divorce has been the most conspicuous contributing factor to the increase in the solo-living category. Over the last 10 years, 32,715 persons were added to the single (never married), separated, widowed, and divorced categories. Divorced persons accounted for 43.1 percent of this increase, single persons for 40.1 percent, and the widowed for 16.8 percent. The percentage increase of divorced persons was as high as 125.2 between 1971 and 1981, and 77.6 between 1981 and 1991. Overall, the trend confirms that solo living is growing at a significant rate.

Table 8.3 Manitoba's Population by Ethnic Origin, 1981 and 1986

Ethnic Origin	1981		1986[1]	
	Number	%	Number	%
A. Single Origin	778,230	76.8	563,505	53.7
British[2]	374,000	36.9	224,375	21.4
French[3]	74,050	7.3	55,725	5.3
German	108,145	10.7	96,160	9.2
Ukrainian	99,795	9.9	79,945	7.7
Aboriginal	59,920	5.9	55,410	5.3
Dutch	33,870	3.3	27,875	2.7
Polish	28,450	2.8	22,015	2.1
Others	235,470	23.2	120,075	46.3
B. Multiple Origin			367,740	

Notes:
1. Based on 20 percent sample data.
2. Includes the single origins of English, Irish, Scottish, Welsh, British, and other British.
3. Includes the single origin of French, Acadian, French Canadian, and Québecois.

Sources: Statistics Canada, *Population: Language, Ethnic Origin, Religion, Place of Birth, Schooling — 1981 Census of Canada* (Ottawa: Minister of Supply and Services, 1984); and Statistics Canada, *Manitoba Part 2: Population and Dwelling Characteristics — Census Divisions and Subdivisions* (Ottawa: Minister of Supply and Services, 1988).

Ethnic Composition and Regional Variations

The lack of sufficient and uniform data on ethnic composition prevents analysis of changes over time. However, as the 1981 and 1986 censuses used similar definitions, a direct comparison between these two years is possible. Although the five-year period is very short for temporal analysis, some major changes were observed.

The single most conspicuous feature is the decline in the single ethnic-origin population (British, French, German, etc.), from more than three-quarters of the total in 1981 to just over half the population in 1986 (Table 8.3). The general trend is obviously towards a multiethnic mix and is reflected in the remarkable increase in interethnic marriages and common-law marriages. These have become common practice in the last two decades, particularly among certain immigrant groups.[17] The British (including English, Irish, Scottish, and Welsh) were the dominant group throughout the 1980s, but their absolute numbers as well as their share of the total population declined substantially during 1981–86 (Table 8.3). None of the remaining groups accounted for more than 11 percent in either census, indicating the varied composition of the population.

Persons of German origin were most numerous among the remaining ethnic groups. This is attributed in part to the inclusion of large numbers of Mennonite and Hutterite cultural groups with other Germans in the censuses. The German-speaking Mennonites, the oldest of the group colonists, migrated to the province from southern Russia in 1874 (Case Study 7.3 on page 105).[18] Most of the Mennonites now live in urban centres. The Hutterites immigrated to Manitoba from South Dakota in 1918, and by 1992 the number of Hutterite colonies totalled 81 (Case Study 15.1 on page 233).

The first surge of Ukrainian migrants reached Manitoba during the early period of Prairie settlement, specifically between 1896 and 1913, with a second influx in the 1920s (Chapter 7). The total number of people of Ukrainian origin was close to 100,000 in 1981, but declined to 80,000 by 1986, resulting in a drop in their share of the population from 9.9 percent in 1981 to 7.7 percent in 1986. It is plausible that this decline was partly related to the aging of the Ukrainian farming population in rural Manitoba. During the same period, both the size and share of the single-origin French and the Aboriginals, Dutch, and Polish all declined, mainly because of ethnic mixing. This decline may also be attributed partly to the reluctance of respondents to declare themselves as French, Polish, Aboriginals, and so on in the census enumerations.

For the purpose of spatial analysis, the rural municipalities of Manitoba were divided into six regions: Southeast, Central Plains, Southwest, Central Red River Valley, Interlake, and Parklands.[19] Two other regions were added so that the entire province was covered; the northern census divisions were grouped as a single region, "the North,"[20] and the census division of Winnipeg was also considered a separate region (Table 8.4).[21]

Early regional polarizations resulting from settlement by different ethnic groups in different parts of the province have been minimized by intraprovincial movement as the economic structure of the province has changed over time. For example, a considerable number of the Mennonites have moved from their original rural communities to Win-

Table 8.4 Proportion of Population of Manitoba Regions by Ethnic Origin, 1986

Ethnic Origin	Southeast	Central Plains	Southwest	Winnipeg	Central Red River Valley	Interlake	Parklands	North	Manitoba
British	16.2	21.4	36.5	20.7	16.6	14.1	22.7	14.2	21.4
German	10.4	24.4	5.3	7.2	18.2	7.4	5.6	2.1	9.2
Ukrainian	12.6	2.1	5.6	7.7	8.1	12.5	22.6	3.3	7.7
French	9.8	6.5	2.6	5.3	9.5	2.1	3.8	2.4	5.3
Aboriginal	2.8	1.4	3.0	2.2	1.2	9.2	4.1	44.0	5.3
Dutch	1.6	10.6	1.6	1.6	5.4	2.6	1.0	0.5	2.7
Polish	2.0	0.5	1.5	2.5	2.8	3.0	1.9	0.5	2.1
Other Single Origin	8.1	4.8	4.9	16.3	5.2	13.8	4.0	4.4	11.4
Multiple Origin	36.5	28.3	39.0	36.5	33.0	35.2	34.3	28.7	35.1

Note: Figures are percentages.

Source: Statistics Canada, *Manitoba Part 2: Population and Dwelling Characteristics — Census Divisions and Subdivisions* (Ottawa: Minister of Supply and Services, 1988).

nipeg or to places outside the province.

Perhaps the most conspicuous feature of the current population composition is that, according to the 1986 census, more than 35 percent of the total population have multiple ethnic backgrounds. Within the regions identified, people of "multiple origin" account for a low of 28.3 percent (in the Central Plains) and a high of 39.0 percent of the population (in the Southwest), confirming the existence of a considerable interethnic mix throughout the province.

Although regional variations do not appear to be very significant, some distinct spatial patterns are discernible in the population of single ethnic origin. The British — the most dominant single ethnic group at 21.4 percent — ranked number one in all regions except the Central Plains, the Central Red River Valley, and the North. The highest percentage of British was recorded in the Southwest region (36.5 percent). In the Central Plains and Central Red River Valley, people of German origin ranked at the top (Table 8.4). The number of people of Ukrainian ethnic background was almost equal to that of the British in the Parklands region, where each group accounted for approximately 23 percent of the population. In the North, Aboriginals are still the dominant ethnic group as they have been in the past: in 1986, 44 percent of the population in the region was of Aboriginal background.

Rural-Urban Distribution

According to the Census of Canada, an "urban" area is a place that had attained a population of at least 1,000 and a population density of at least 400 per square kilometre at the previous census. All territory lying outside urban areas is regarded as rural.[22] Between 1971 and 1991, the total population of the province increased by more than 10 percent. Most of this net gain resulted from population growth in urban areas, which experienced an overall increase of approximately 15 percent in 1971–91, although urban population size actually declined slightly during 1976–81. During the same period, 1971–91, the overall size of the rural population remained almost static, showing only 0.9 percent growth. Consequently, the urban component increased from 69.5 percent of the total population in 1971 to 72.1 percent in 1991, with a corresponding decrease in the rural component.

The population change in urban areas followed national economic trends and business cycles, and thus appeared as a series of population surges. During the recession of the late 1970s, for example, the population in urban centres remained constant or decreased slightly. In contrast, rural population trends reflected a population redistribution across the province and the rapidly changing conditions of farm economies.

Rural Population Distribution and Regional Variation

The data for 1971–91 show some distinct patterns (Figure 8.3). To varying degrees, all the rural regions experienced a decline. Only the municipalities located close to Winnipeg gained in both the 1971–81 and 1981–91 intercensus periods. By 1986, 78 percent of the provinces's population lived within a 150 km radius of the centre of Winnipeg, a trend that has been further accentuated over the last five years.[23]

A recent study of the population of agro-Manitoba explained the primary causes of population redistribution in rural municipalities.[24] It suggested that the major population shifts in rural municipalities surrounding the city of Winnipeg can be attributed to the expanding role of the city as an employer, primarily in offering jobs in the service sector. Thus a forceful "pull" factor has been operating in this area for the last few decades.

In the past, Winnipeg played a pivotal role, as the "gateway to western Canada," in transforming the economic and political landscape of the province, and since the mid-20th century, more than half of the province's population has lived in this urban agglomeration. In 1971, 535,233 persons resided in Winnipeg, 54.2 percent of Manitoba's population of 988,247. Two decades later, the city contained 56.5 percent of the province's population, for a 15.2 percent increase in the city's population. With increased diversification of the nonagricultural economy on the one hand, and the uncertainty of the farm economy on the other, many people have left their traditional place of rural residence and moved into, or close to, the major city.

The constant drain of people

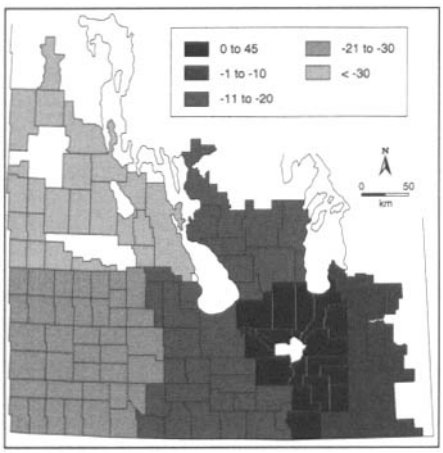

Figure 8.3 Population Changes for Major Regions of Manitoba, 1971–91. The numbers indicate percentage change. (Source: Data compiled from A. MacLean and R. Rounds An Analysis of the Population of Agro-Manitoba 1961–1986 *[Brandon: Brandon University Rural Development Institute, 1991] and Statistics Canada,* Urban Areas: Population and Dwelling Counts *[Ottawa: Minister of Industry, Science and Technology, 1992])*

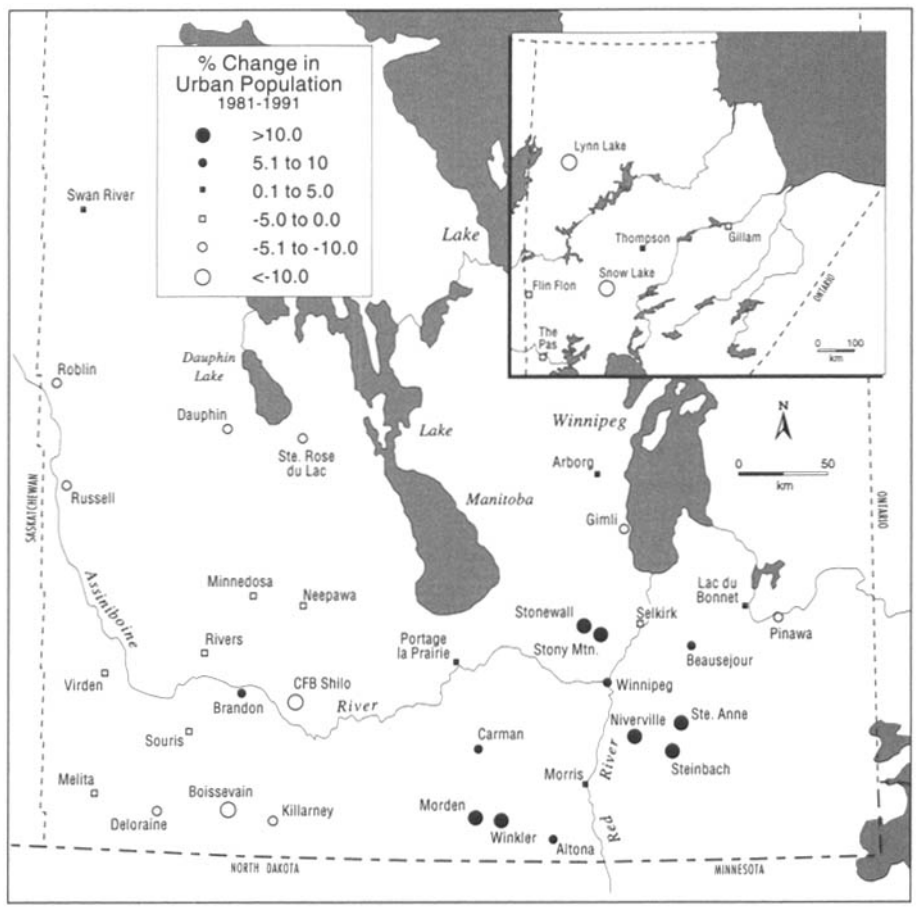

Figure 8.4 Changes in Manitoba's Urban Population, 1981–91. (Source: Data compiled from Statistics Canada, Population and Dwelling Counts — Provinces and Territories: Manitoba *[Ottawa: Minister of Supply and Services, 1987]; and Statistics Canada,* Urban Areas: Population and Dwelling Counts *[Ottawa: Minister of Industry, Science and Technology, 1992])*

from rural municipalities, especially from the Parklands, Southwest, and Central Plains regions, has been associated with a number of factors. The most conspicuous has been a "push factor" — the amalgamation of farms into ever-larger units, with the resultant loss of farm employees and/or farm families. As the number of farms diminished, the supporting businesses and services lost their consumers. In the rural municipality of Whitewater in the Southwest region, for instance, settlements have lost large numbers of businesses, and the municipality has lost continuously from both its farm and nonfarm populations. Because of reorganization of school districts, the municipality has also lost schools and related recreational facilities. This pattern has been a common feature in most rural municipalities in the peripheral regions of Manitoba.[25]

Urban Population Distribution and Temporal Changes

In the 1981 census there were 41 urban centres in Manitoba. From these the town of Grandview was excluded in 1986 because its population had fallen below 1,000. However, by 1986 two other centres, St. Adolphe and Arborg, both within the Central Red River Valley region, had increased in size and were defined as urban centres. During the 1980s, some single-resource-based towns experienced severe setbacks due to declining prices and increased international competition.

Typical was the situation at Lynn Lake, where after 1965, discoveries by Sherritt-Gordon Mines Ltd. brought about large capital investment in nickel production, so that by 1970 the population of the town had grown to 3,260.[26] In the 1980s, however, when grim economic conditions forced the company to lay off many miners, the town lost viability. Its population declined from 2,087 in 1981 to 1,642 in 1986, to a low of 834 in 1991 and loss of its urban status in the 1991 census. The populations of most single-resource-based towns (such as Flin Flon and Snow Lake) showed a declining trend throughout the 1980s (Chapter 12).

Although the overall patterns of change in urban centres indicated relative stability, with an increase of 6.5 percent during the period 1981–86 and of 2 percent during the period 1986–91, the regional variations were quite significant (Figure 8.4). The populations of 16 of the 41 urban centres that existed in 1981 decreased during 1981–86, and the number of towns and cities that lost population continued to increase in the late 1980s, so that between 1986 and 1991 the population declined in no fewer than 26 urban centres. The highest rate of population loss was confined to northern single-resource-based towns. In the south, in the service-oriented towns and cities surrounded by rural municipalities, the rate of population change appeared to be a direct response to nonfarm employment opportunities. For example, the significant growth of Winkler and

Table 8.5 Population Projections for Manitoba, 1991–2011

Source	1991	1996	2001	2006	2011
George and Perreault (1985)	1,122,900[1]	1,137,500	1,135,100	1,127,000	not available
	1,137,900[2]	1,176,800	1,202,400	1,221,700	
Akkerman (1988)	1,130,665	1,158,219	1,177,333	1,189,650	1,196,965
Manitoba Bureau of Statistics (1992)	1,101,500	1,127,100	1,147,400	1,167,300	1,189,700

Notes:
1. Based on assumptions for "projection series 1."
2. Based on assumptions for "projection series 4."

Sources: A. Akkerman, *Household and Population Projections for Subareas of Metropolitan Winnipeg and the Rest of Manitoba, 1986–2021* (Edmonton: Demosystems, 1988); M.V. George and J. Perreault, *Population Projections for Canada, Provinces and Territories 1984–2006* (Ottawa: Minister of Supply and Services, 1985); Manitoba Bureau of Statistics, *Manitoba Regions: A Statistical Profile 1991* (Winnipeg: Manitoba Bureau of Statistics, 1992).

Morden reflected growing agro-based industrialization (Chapter 17).

Although population changes in urban centres are not consistent over time, a distinct spatial pattern can be discerned. The mid-sized and smaller centres close to the city of Winnipeg are growing rapidly. Steinbach and Stonewall, for instance, have grown by 22 and 37 percent, respectively, during the last decade, the highest rate of urban growth in the province. In contrast, the towns located in the western half of the province experienced a slow decline during the 1980s. However, a study over an extended period indicated that:

> no consistency exists in the identity of towns losing population from one census to the next. Unlike the RM's [rural municipalities], wherein a population drop in one 5-year interval tended to follow and be followed by other such declines, towns experiencing significant population losses in one period rarely lost to a similar degree in subsequent intervals.[27]

In summary, it appears that towns tend to be responding, at least in part, to influences unique to their situations rather than to provincewide factors. Overall, in view of the considerable decline in farm numbers and population throughout recent decades, the long-term future of many small towns is veiled in uncertainty.[28] However, as many small towns have grown in size and importance while others have declined, a degree of equilibrium has been maintained.

POPULATION PROJECTIONS: THE FUTURE

Based on a number of assumptions and observations of past and present trends, demographers attempt to project future population size and characteristics. Projections and estimates — they are not predictions — should be considered a guide rather than an explanation of reality, and as such they can be very effective planning tools. Several authorities have prepared population projections for Manitoba, at both provincial and subregional levels (Table 8.5).[29]

Provincial Population Projections

The most extensive projections at the provincial level were prepared and compiled by George and Perreault.[30] Based on combinations of demographic components such as fertility, internal migration, and international migration, they offered five alternative series of projections.[31] Their projection series 1 presented a low-growth scenario (Table 8.5). If a low-growth trend persists, Manitoba will reach a peak of about 1,137,500 by 1996, and then will begin to decline. However, it has been suggested that the "baby bust" of the 1970s and 1980s has been caused partially by the postponement of childbearing until a later stage in life.[32] If that is true, there could be an upturn in fertility throughout the 1990s.

The projections may also be affected by the expected changes in the federal government's policy on immigration. In 1993 the federal government set a goal of receiving 250,000 international migrants per year, and it may be reasonably assumed that the net inflow would surpass the 100,000 mark, as embodied in George and Perreault's projection series 4. Manitoba usually receives about 5 percent of new arrivals to Canada. According to projection series 4, by the end of this century the province will likely have a population of 1,202,400, which may continue to grow very slowly in the following decades.

Based on the assumption of constant survival rates published by Statistics Canada, Akkerman[33] in 1988 also predicted a slow growth in Manitoba's population, reaching 1,177,333 by 2001 and 1,996,965 by 2011. Projections prepared by the Manitoba Bureau of Statistics[34] in 1992 indicate a slower population growth rate, reaching 1,147,400 by 2001 and 1,189,700 by 2011. The 1991 census counted a total of 1,091,942 persons in Manitoba. Thus the projections described above, as well as that prepared by Framingham in 1975, overestimated the 1991 population. This implies that if the trend of the 1990s continues, the province's population may decline before the end of the century. Along with that, the median age of the population will move upward considerably because of aging of the demographic structure (Case Study 8.1 on page 119).

In the immediate future, the impact of the aging process on social costs may be mitigated by the reduced amounts spent on education, health, and other social services required for the young.[35] However, the long-term perspective could be

Table 8.6 Population Projections for Manitoba Subregions, 1996–2021

Subregions	1996	2001	2006	2011	2016	2021
Southeast	16,487	16,081	15,189	14,342	13,524	12,740
Central Plains	86,270	83,987	81,312	78,422	75,376	72,139
Southwest	113,279	112,467	111,052	109,157	106,867	104,044
Winnipeg	675,644	695,443	710,663	722,003	730,251	734,303
Central Red River Valley	119,537	123,996	127,596	130,503	132,702	134,077
Interlake	22,559	22,081	21,422	20,657	19,763	18,787
Parklands	44,757	41,325	37,820	34,403	31,087	27,918
North	79,688	81,958	84,598	87,483	90,679	94,108
Total	1,158,221	1,177,338	1,189,652	1,196,970	1,200,249	1,198,116

Source: A. Akkerman, *Household and Population Projections for Subareas of Metropolitan Winnipeg and the Rest of Manitoba, 1986–2021* (Edmonton: Demosystems, 1988).

quite different. Wolf points out that as aging continues, the proportion of older people with working-age children will decline.[36] If life expectancy increases substantially, with fewer people dying of chronic diseases but with a larger number of frail and disabled elderly, the requirements of the aged for health and social services will obviously be enormous.

In response to the changing demographic situation, the federal government might modify its immigration policies, so some changes in the projected population may be expected at the national level. Manitoba's population, however, will indeed depend on the province's success in attracting newly arrived international immigrants.

Subregional Population Projections

Both Akkerman[37] and the Manitoba Bureau of Statistics[38] have prepared subregional population projections for the province of Manitoba. It is worth noting here that the provincial projections are reasonably consistent, particularly in their consensus that the province will experience a slow population growth in the coming decade or decades, and then will face a declining population.

In contrast, since both interprovincial and intraprovincial migration patterns are unstable phenomena, associated directly with short-term economic growth trends, it is extremely difficult to prepare reliable subregional population projections. Framingham, for instance, predicted a significant increase for the northern region of the province throughout the 1990s, based on the data on population movement in the late 1960s and 1970s.[39] This did not happen; instead, the population of the northern region actually decreased.

To show what would happen if current trends continue, subregional population projections compiled from Akkerman[40] are presented in Table 8.6. It appears that Winnipeg will continue to grow, first because the city is likely to attract most of the newly arrived international immigrants, and second because the predominant economic activities of the future will be in the service and technology-based sectors. The regions surrounding the city of Winnipeg, especially the southwestern part of the Red River Valley, will increase in population as more internal and international migrants settle in that growing region.

Akkerman indicated that the northern region could also experience population growth in the future as fossil fuels become scarce.[41] In contrast, the Manitoba Bureau of Statistics, relying upon the trends of the 1980s, projected a decline in the population of the north. Such contrasting viewpoints indicate that the natural-resource-based communities are more vulnerable to short-term economic fluctuations than others such as agricultural or service-oriented communities. Indeed, both economic development and population growth in the north will largely depend on future trends in technology, the extent of association between economic growth and natural resources, and the state of physical environmental conditions.

All other regions, which consist primarily of agricultural communities with hierarchical service towns (Chapter 11), are expected to decline to varying degrees. The most steady decline is predicted to occur in the Parklands and Southeast regions. Overall, the province is expected to face a declining population after the first quarter of the next century.

CONCLUSION

Before World War II, the contribution of natural increase to Manitoba's population growth was limited by the province's small population base. The need for larger numbers to colonize the agricultural frontiers was largely met through internal and international migration. The population has been generally quite dispersed on the Prairies, with a relatively higher density in settlements along the railway lines. This can be attributed to the fact that the land was the principal means of generating economic activity, and that the increase in farm production in the initial decades of settlement was realized through the expansion of land occupancy.[42] Overall, rural settlements and activities were the dominant features in the economic domain and visual landscape.

Since 1951, Manitoba's population growth has been characterized by two distinct trends. First, the postwar baby boom was reflected in a surge in fertility rate, and this coincided with waves of new immigrants in the late 1950s. Second, since the early 1960s this province, like other parts of the country, has experienced a steady decline in fertility rate, resulting in the gradual aging of the population structure.[43] The net effect has been that, with a share of less than 5 percent of the Canadian population since 1971, Manitoba has been losing its posi-

tion relative to the total national population. More important, given the fact that the province's share has been declining consistently since the 1970s, if current trends continue, the long-term effects of the current demographic structures are likely to be very profound and pervasive.

In the years since World War II, subnational, national, and global economic structures have diversified, with the introduction of new technologies and the internationalization of agribusiness. Preexisting economic and spatial organizations have been transformed into new forms and relationships to adjust to the changed conditions. New patterns of rural-urban population distribution have emerged through the rearrangement and redistribution of existing settlements. The traditional family farms, based in the rural hinterlands, have lost their dominance. At the same time, nonagricultural activities such as manufacturing, power development, construction, and administrative, managerial, educational, health, and other social and personal services have expanded, primarily in the city of Winnipeg.[44] The complementary nature of the nonfarm activities, their need for support by a sizable local market, and the merits of economies of scale have historically helped the capital city emerge as the "primate city" of the province (Chapter 10). These factors are more pronounced at present.

The advent of certain types of nonagricultural activities, particularly the extractive resource-based industries, has created single-resource-based towns and small urban centres, particularly in the northern part of the province, since the early 1960s.[45] In some cases the life span of these resource-based urban centres has been short because of the vulnerability of metals and natural resources to international price competition.

These changes have created a distinct type of settlement distribution in Manitoba: a huge concentration of urban population in a single large city, surrounded by regional cities and towns, dispersed rural settlements, and mining and other resource-based towns. Such a pattern is primarily the inevitable outcome of ongoing socioeconomic processes. However, careful observation and modification of the pattern may be required to ensure the sustainable economic development of Manitoba in the future.

NOTES

1. Canada West Foundation, *Canada West: Fact Finder 1992* (Calgary: Canada West Foundation, 1991).
2. K. Coates and F. McGuinness, *Manitoba: The Province and the People* (Edmonton: Hurtig Publishers, 1987), 1.
3. Ibid., 23–4.
4. W.L. Morton, *Manitoba: A History,* 2nd ed. (Toronto: University of Toronto Press, 1967), 448.
5. J. Dumas, *Current Demographic Analysis: Report on the Demographic Situation in Canada, 1988* (Ottawa: Minister of Industry, Science and Technology, 1990), 110.
6. Ibid.
7. A. MacLean and R. Rounds, *An Analysis of the Population of Agro-Manitoba, 1961–1986* (Brandon: Brandon University, Rural Development Institute, 1991), 1.
8. The youth dependency ratio is calculated by considering persons aged 0–14 as a percentage of those aged 15–64.
9. Dumas, *Report on the Demographic Situation . . . 1988,* 60.
10. The total dependency ratio represents the ratio of persons aged 0–14 plus persons aged 65 and over to those aged 15–64.
11. The elderly dependency ratio is the ratio of persons 65 and over to those aged 15–64.
12. J. Dumas, *Current Demographic Analysis: Report on the Demographic Situation in Canada, 1986* (Ottawa: Minister of Supply and Services, 1987), 10–1.
13. J. Dumas, *Report on the Demographic Situation in Canada, 1992: Current Demographic Analysis* (Ottawa: Minister of Science and Technology, 1992), 32.
14. "The total fertility rate is obtained by adding together the age-specific fertility rates for women of each age. . . . It represents the number of children that would be born (ignoring mortality) to a hypothetical group of 1,000 women who, as they pass through the reproductive ages, experience the particular age-specific birth rates on which the index is based"; A.H. Pollard, F. Yusuf, and G.N. Pollard, *Demographic Techniques* (Willowdale, NS: Pergamon Press, 1981), 91.
15. Dumas, *Report on the Demographic Situation . . . 1992,* 46.
16. R. Beaujot, *Population Change in Canada: The Challenges of Policy Adaptation* (Toronto: McClelland and Stewart, 1991), 239.
17. B. Ram, "Intermarriage Among Ethnic Groups," in *Ethnic Demography: Canadian Immigrant, Racial and Cultural Variations,* ed. S.S. Halli, F. Trovato, and L. Driedger (Ottawa: Carleton University Press, 1990), 213–28.
18. T.R. Weir, "The Population," in *The Prairie Provinces,* ed. P.J. Smith (Toronto: University of Toronto Press, 1972), 88.
19. This division into six regions follows the system used in Manitoba Bureau of Statistics, *Manitoba Regions: A Statistical Profile 1991* (Winnipeg: Manitoba Bureau of Statistics, 1992) and in MacLean and Rounds, *An Analysis of the Population,* 33–5. The corresponding census divisions of the six broad regions are as follows: Southeast — census division 1; Central Plains — census divisions 3, 4, 8, and 9; Southwest — census divisions 5, 6, 7, and 15; Central Red River Valley — census divisions 2, 10, 12, 13, and 14; Interlake — census division 18; and Parklands — census divisions 16, 17, and 20.
20. This region includes census divisions 21, 22, and 23.
21. This region contains only census division 11.
22. Statistics Canada, *Urban Areas: Population and Dwelling Counts* (Ottawa: Minister of Industry, Science and Technology, 1992), 178.
23. "Living in the Valley," *Winnipeg Free Press,* 2 January 1992, A6.
24. MacLean and Rounds, *An Analysis of the Population,* 3–26.
25. Ibid., 21.
26. K.B. Richmond and J.J. Keleher, *Manitoba 2000: Population Size and Distribution* (Winnipeg: Manitoba Environmental Council, 1975), D7–8.
27. MacLean and Rounds, *An Analysis of the Population,* 9.
28. J. Brierley and D. Todd, *Prairie Small-Town Survival: The Challenge of Agro-Manitoba* (New York: Edwin Mellen Press, 1990), 11.
29. These include C.F. Framingham, "Manitoba's Projected Population Growth and Distribution," in *Manitoba 2000: Population Size and Distribution,* ed. K.B. Richmond and J.J. Keleher (Winnipeg: Manitoba Environmental Council, 1975), C1–18; A. Akkerman, *Household and Population Projections for Subareas of Metropolitan Winnipeg and the Rest of Manitoba 1986–2021* (Edmonton: Demosystem, 1988); M.V. George and

J. Perreault, *Population Projections for Canada, Provinces and Territories, 1984–2006* (Ottawa: Minister of Supply and Services, 1985); and Manitoba Bureau of Statistics, *Manitoba Regions,* 1992.

30. George and Perreault, *Population Projections.*
31. The mortality assumption was the same for all the series. Assumptions underlying the three projections relevant to this chapter were as follows: (a) for projection series 1, fertility, in terms of number of children per woman by 1996, was held at 1.40, with a net population gain of 50,000 through international immigrants per year; (b) for projection series 4, fertility level was held at 1.66 with net population gain of 100,000 international immigrants per year; and (c) for projection series 1 and 4, the internal migration patterns for the period 1966–84 were assumed to be continued.
32. Beaujot, *Population Change,* 237–9.
33. Akkerman, *Household and Population Projections.*
34. Manitoba Bureau of Statistics, *Manitoba Regions.*
35. Beaujot, *Population Change,* 229–34.
36. D.A. Wolf, "Kinship and Family Support in Aging Societies," in *Economic and Social Implications of Population Aging,* International Symposium on Population Structure (New York: United Nations, 1988).
37. Akkerman, *Household and Population Projections.*
38. Manitoba Bureau of Statistics, *Manitoba Regions.*
39. Framingham, "Manitoba's Projected Population."
40. Akkerman, *Household and Population Projections.*
41. The issues relating to the limits to world oil are discussed in C. Flavin, *World Oil: Coping with the Dangers of Success,* Worldwatch Paper 66 (Washington, DC: Worldwatch Institute, 1985), 23–33.
42. J.L. Tyman, *By Section, Township, and Range: Studies in Prairie Settlement* (Brandon: Assiniboine Historical Society, 1972); and Coates and McGuinness, *Manitoba: The Province.*
43. Dumas, *Report on the Demographic Situation . . . 1992,* 44–54.
44. Morton, *Manitoba: A History,* 449–502.
45. A.E. Borys and J. Rink, "The Natural Resources of Manitoba: An Overview," in *Manitoba 2000,* ed. Richmond and Keleher, D1–44.

Case Study 8.1
Graying of Manitoba

Geoffrey C. Smith

In 1991, 146,605 Manitobans were 65 years (the Canadian retirement age) and over.[1] Defined on this basis, "the elderly" comprised 13.4 percent of the provincial population in 1991 compared with 11.9 percent in 1981, representing a 20.3 percent increase in absolute numbers. It is notable that the percentage of elderly people in Manitoba's 1991 population exceeded the corresponding national value of 11.6 percent. The relatively high proportion of elderly people in Manitoba is attributable to several demographic processes, particularly the emigration of younger-age cohorts from the province. A breakdown of the elderly on the basis of gender reveals that in 1991, 57.9 percent (84,945 persons) were females, reflecting the higher mortality among men.

When the provincial population is disaggregated on the basis of age, the 1991 census data reveal that the *young-old* (65–74 years) comprised 82,635 persons, or 56.4 percent of Manitoba's elderly. Of the 63,960 persons aged 75 years and over (the *old-old*), 23.7 percent (15,190 persons) were aged 85 years and over (the *oldest-old*). Also, 61.6 percent (39,415 persons) of the old-old were females. Although the sex ratio of Manitoba's elderly population was stable between 1981 and 1991, the percentage increase of the old-old (33.9 percent) exceeded considerably that of the young-old (11.6 percent). These upward shifts in the age distribution of the elderly will clearly place increasing pressures upon the long-term care resources of the province.

Figure 8.1.1a shows the percentages of the populations of non-metropolitan census divisions that were 65 years and over in 1991. The most significant relative concentration of elderly persons is in the census divisions that include the small rural towns of southwestern Manitoba, with values between 15.0 percent and 21.4 percent. In marked contrast, the four northernmost census divisions all register values of less than 9.0 percent. The main processes producing this pattern include the aging-in-place of long-time residents, shifts of younger persons to urban areas (including Winnipeg), and migration of the elderly.

Figure 8.1.1b reveals that the census divisions recording the highest percentage increases in the numbers of elderly persons between 1981 and 1991 were generally those that had relatively modest percentages of their populations consisting of persons 65 years and over in 1991. Interestingly, the most pronounced relative growth occurred in southeastern Manitoba, with four of the five census divisions bounding Winnipeg registering values exceeding 20.0 percent.

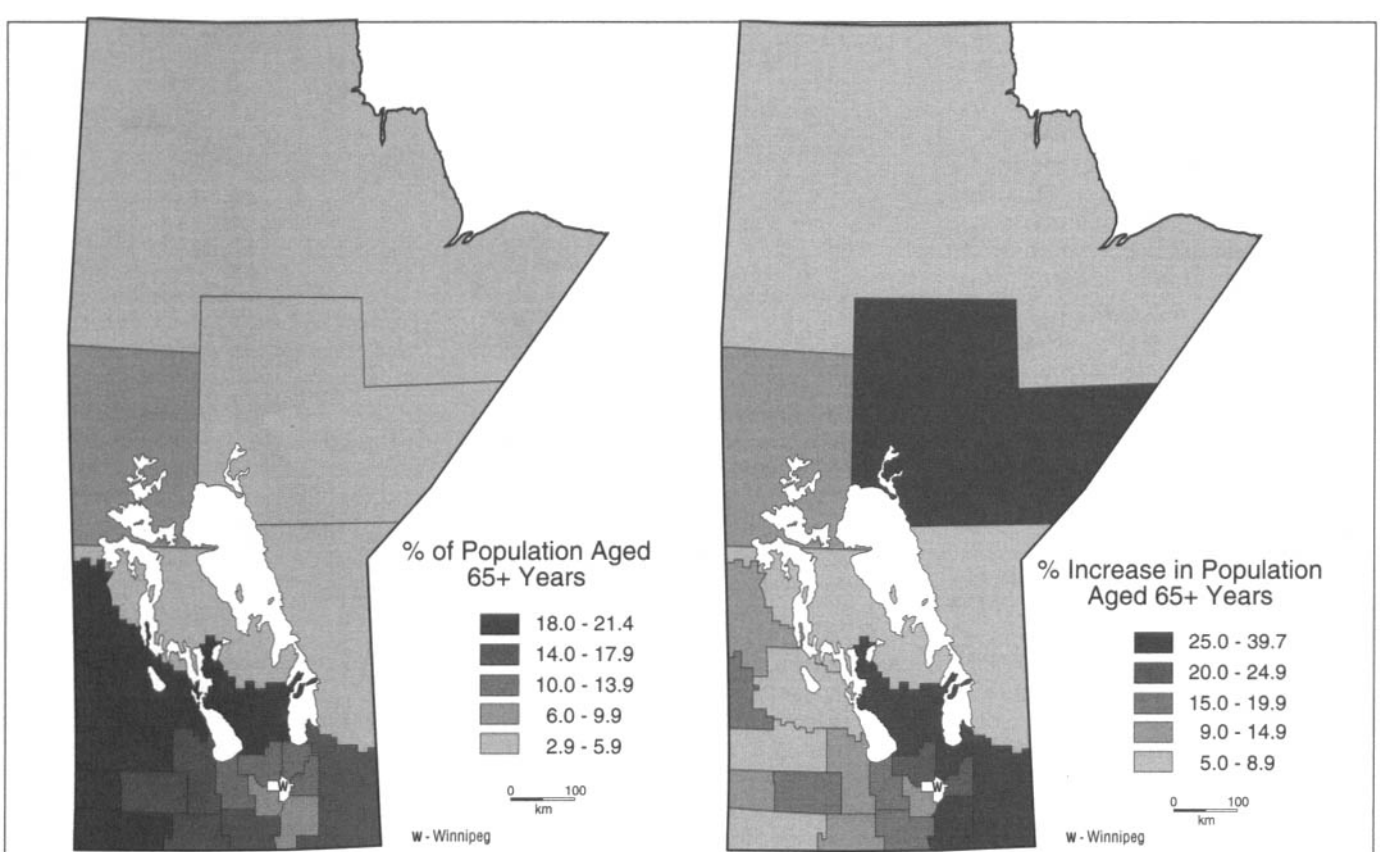

Figure 8.1.1(a) Percentage of Manitoba's Population Aged 65 and Over in 1991; (b) Percentage Increase in Manitoba's Population Aged 65 and Over, 1981–1991 (Sources: Statistics Canada, Census Divisions and Subdivisions — Selected Characteristics 1981 *[Ottawa: Statistics Canada, Catalogue No. 93-919, 1982]), and Statistics Canada,* Profile of Census Divisions and Subdivisions in Manitoba — Part A 1991 *[Ottawa: Statistics Canada, Catalogue No. 95-358, 1992])*

In 1991, 74.9 percent of the provincial elderly population was classified as "urban," with 57.3 percent residing in the Winnipeg Census Metropolitan Area (CMA), compared with 55.3 percent in 1981. This represents an increase of 24.6 percent in the number of elderly CMA residents during the 10-year period. Although this trend may be partly attributed to the redefinition and extension of CMA boundaries between 1981 and 1991, the aging-in-place of earlier rural-to-urban migrants was also a contributing factor.

Figure 8.1.2a, which records percentages of older people residing in postal code areas within Winnipeg's city limits in 1991, indicates that most of the significant elderly concentrations were in the inner city. One explanation for this is that many elderly people typically remained in the older central core neighbourhoods where they first purchased homes. However, it is notable that several of the postal code areas with high proportions of elderly people in both the inner city and suburbs have major government-subsidized seniors' housing projects and/or private nursing homes located within their boundaries.

The number of elderly persons in the suburbs of Winnipeg CMA increased by 47.8 percent between 1981 and 1991, compared with gains of only 0.6 percent in the inner city. As a result, the suburban share of the metropolitan elderly increased from 51.0 percent to 60.5 percent. Figure 8.1.2b indicates that percentage gains were particularly pronounced in the outer suburban postal code areas. The main process contributing to the suburbanization of Winnipeg's elderly population during the 1980s was the aging-in-place of people who originally moved to the suburbs during an earlier period, when they were at the child-rearing stage of the family life cycle.

Although the shifts in the spatial distribution of Manitoba's older population between 1981 and 1991 were highly significant, it should be noted that the extent of the segregation between the elderly and nonelderly increased slightly in terms of (1) the provincial non-metropolitan/metropolitan distribution and (2) the Winnipeg inner city/suburban distribution. In 1991, 60.0 percent of the provincial population under age 65 resided in Winnipeg CMA, while no less than 70.8 percent of the Winnipeg nonelderly were suburbanites. Thus, the elderly were more likely to live in inner areas of Winnipeg than their younger counterparts.

In conclusion, recent changes in both the absolute numbers and the spatial distribution of Manitoba's older population clearly have important implications for all providers of services targeted towards the shelter, care, and well-being of the elderly.

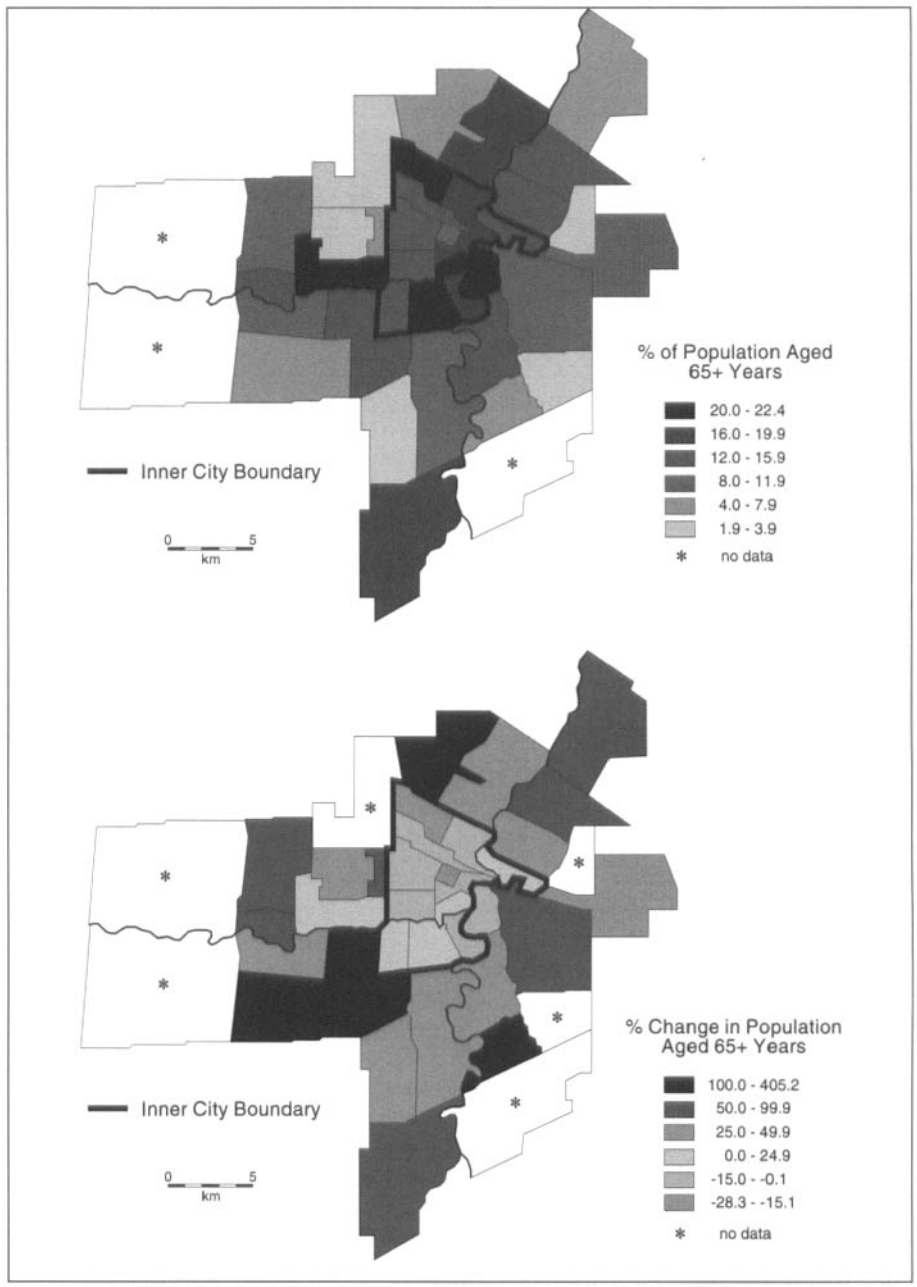

Figure 8.1.2(a) Percentage of Winnipeg's Population Aged 65 and Over in 1991: (b) Percentage Change in Winnipeg's Population Aged 65 and Over, 1981–1991 (Sources: Manitoba Department of Health, Population of Winnipeg by Postal Code, Age and Sex, December 1, 1981 *[Winnipeg: Manitoba Department of Health as per M.H.S.C. Registration Data, Division of Administrative Services, 1982], and Manitoba Health Services Commission,* Manitoba Health Population Report: Part 2, Population of Winnipeg by Postal Code, Age Group and Sex, June 1, 1991 *[Winnipeg: Manitoba Health Services Commission, December 1991])*

NOTES

1. Original sources include: Manitoba Department of Health, *Population of Winnipeg by Postal Code, Age and Sex, December 1, 1981* (Winnipeg: Manitoba

Department of Health, Division of Administrative Services, June 1982); Manitoba Health Services Commission, *Manitoba Health Population Report: Part 2, Population of Winnipeg by Postal Code, Age Group and Sex, June 1, 1991* (Winnipeg: Manitoba Health Services Commission, December 1991); Statistics Canada, *Census Divisions and Subdivisions – Selected Characteristics, 1981*, Catalogue No. 93-919 (Ottawa: Statistics Canada, 1982); Statistics Canada, *Profile of Census Divisions and Subdivisions in Manitoba – Part A, 1991*, Catalogue No. 95-358 (Ottawa: Statistics Canada, 1992); Statistics Canada, *Age, Sex and Marital Status: The Nation, 1991*, Catalogue No. 93-310 (Ottawa: Statistics Canada, 1992).

Case Study 8.2
Changing Religious Trends in Manitoba

Laurence Nixon

Recent trends in religious belief, practice, and affiliation in Manitoba can be summarized as follows: while mainline Protestant denominations are declining, people indicating no religious affiliation, as well as participants in Aboriginal religion and religions of Asian origin, are increasing. These trends are actually more pronounced than the census figures suggest, because the 1991 census form instructed census-takers to "indicate a specific denomination or religion even if this person is not currently a practising member of that group."[1] This means that the figures given for mainline Christian churches are inflated, whereas the figures reported for "Native religion" and "no religion" are lower than the actual numbers.

Christian Churches

During 1981–91 the major Protestant denominations sustained significant losses in membership: those declaring themselves to be Lutherans declined by 6 percent (from 58,830 to 55,130); the number of Anglicans declined by 13 percent (from 108,220 to 94,190); membership in the United Church fell by 17 percent (from 240,400 to 200,375); and Presbyterians decreased in number by 30 percent (from 23,910 to 16,050).

This general picture for the province is mirrored in data gathered from the western Manitoba area. Those interviewed stated that fewer people are attending services on a regular basis and that the average age of participants is increasing. At the same time, fewer persons are playing an active role in church groups such as the choir; groups that visit the sick, the elderly, and the bereaved; and groups organizing potluck suppers, bake sales, teas, and funeral lunches.

Furthermore, the average age of the members of these groups is increasing. As congregations decrease in size, they can no longer afford to support a minister, and so they are forced to share one with two or three other diminishing congregations, resulting in a reduction in pastoral services. The data from both the census reports and from interviews suggest that the memberships of mainline Protestant denominations will continue to decline well into the 21st century. This may be due to two factors. On the one hand, a large percentage of persons from mainline Protestant families attend university, and as a result find it increasingly difficult to accept uncritically the beliefs of their ancestors. On the other hand, it may be that those who are still able to preserve their faith intact may desire a more experiential or consoling church service, especially in difficult socioeconomic times.

During the 1980s, the membership of some evangelical denominations increased. The Christian and Missionary Alliance church grew by 57 percent (from 2,015 to 3,155) and the Methodists by 64 percent (from 2,085 to 3,415). Even more dramatic, in terms of absolute numbers, was the growth of the Pentecostal church. In 1981 there were 15,830 Pentecostals, whereas in 1991 there were 21,210, an increase of 30 percent. On the other hand, the increase in the Mennonite population was a modest 4 percent (from 63,490 to 66,000), and the Salvation Army actually declined by 22 percent (from 3,695 to 2,835). These figures should not be taken to mean that conservative Protestant doctrine is growing in popularity. Rather, what seems to be indicated, especially by the growth of the Pentecostal denomination, is that the number of people seeking consolation in religious experience is rising.[2]

The fortunes of the older, liturgically oriented denominations[3] vary from moderate gains to marked decline. The Roman Catholic church, the largest of the Christian denominations in Manitoba, had a 6 percent increase in population (from 269,465 to 293,950), Orthodox Christians (primarily Ukrainian and Greek) decreased by 2 percent (from 21,135 to 20,655), and Ukrainian Catholics declined by 32 percent (from 49,350 to 33,410). Some, if not all, of the increase in Roman Catholic membership may be due to immigration from countries like the Philippines. Quite apart from immigration, however, it is clear that neither the Roman Catholic nor the Ukrainian Orthodox churches are suffering the same fate as the mainline Protestant churches. One possible explanation is that a traditional service that emphasizes ceremony at least as much as intellectual content may provide a greater sense of comfort and reassurance.

No Religious Affiliation

One factor contributing to the decline in membership and attendance of some mainline churches is undoubtedly the crisis in faith expressed by the sharp rise in the number of persons who indicated "non-denominational Christian" or "no religion" on their census forms. In 1981, 8,185 persons said they were unaffiliated Christians; in 1991, the number had risen to 34,515 (an enormous increase of 325 percent). And from 1981 to 1991 the number of people choosing the "no religion" category increased from 74,365 to 148,170 — an increase of 100 percent.

On the basis of interviews with those who indicated "no religion" on the 1991 census form, such persons can be placed in one of two general

categories. Some are atheists or agnostics even though they did not so specify on the census form; in fact, only 1,375 persons in Manitoba explicitly stated that they were atheists or agnostics during the 1991 census. The other category consists of those who adhere to beliefs and practices belonging to the "new age." Prominent are beliefs in the interconnectedness of all things, meditation, spirit entities, reincarnation, goddess worship, wicca, tarot cards, astrology, and so on. Such beliefs are expressions of a desire to experience the world as enchanted. Perhaps this desire is, at least to some degree, a compensation for the limited economic opportunities in the late 20th century.

Both of these groups shared a common set of criticisms of the churches. Frequently mentioned was the idea that to join a church requires a sacrifice of the intellect and will in accepting church dogma and discipline. Another complaint was that churches preach a doctrine of exclusivity, whereas the critics felt that the churches ought to be open to other faiths and nonreligious perspectives. The churches were also accused of being sexist, intolerant of alternative lifestyles, and encouraging of emotional dependence and infantilism. These views may reflect the increased exposure of the population to university courses. Some respondents mentioned that they had been influenced in their thinking by a course in world religions.

Native Religion

Statistics Canada reported that between 1981 and 1991 the adherents of Native religion increased from 220 to 1,175. But these figures are a poor reflection of the degree of actual participation. Aboriginal religion was not mentioned as an option on the census form, and census-takers were instructed to put down a denomination (i.e., a Christian denomination) of some sort.

Interviews conducted in 1991 showed that in 36 of the 51 larger Manitoba reserves, traditional ceremonies are being conducted regularly. These include the sweat lodge, the sharing circle, the shaking tent, and the sun dance. There are also life-cycle rituals such as naming ceremonies, vision fasts, Midewiwin initiations, and traditional funerals. Like Pentecostalism, new-age religion, and, to a lesser extent, traditional liturgically oriented churches, Aboriginal religion is experiential, and can therefore serve a consoling function. It also provides an opportunity to affirm Aboriginal identity at a time when this very identity is in danger of being lost.

Asian Religions

Another religious trend in Manitoba during the 1980s was the rise in the number of adherents of Asian religions. The Muslim population, most of whom come from West or South Asia, increased by 87 percent, from 1,920 in 1981 to 3,525 in 1991. The Sikh community grew by just over 100 percent, from 1,685 to 3,495. The number of Hindus grew from 1,750 to 3,470, an increase of 107 percent, and the number of Buddhists rose from 2,010 to 5,260, a gain of 162 percent.

Followers of these faiths are mostly found in Winnipeg, where there is a Hindu temple, at least two mosques, a Japanese Buddhist temple, a Vietnamese Buddhist pagoda, a Laotian Buddhist monastery, and several Sikh temples. However, the presence of Asian religions is by no means restricted to that city. The growth of Asian religions can be accounted for, at least in part, by changing immigration patterns combined with the Asian immigrants' high level of professional competence, their desire to affirm their ethnic identity, and increased tolerance (or relative absence of intolerance) towards non-Christian religions on the part of the general Canadian population.

NOTES

1. Information presented in this case study is based on Statistics Canada, *Population, Religion,* Catalogue 92-912, Vol. 1 (Ottawa: Statistics Canada, 1982); Statistics Canada, *Religions in Canada, the Nation,* Catalogue 93-319 (Ottawa: Statistics Canada, 1991); Statistics Canada, *1991 Census Handbook* (Ottawa: Statistics Canada, 1992); and interviews conducted by Brandon University researchers during 1992 and 1993.
2. In Pentecostal services, for example, a deliberate effort is made to create a mood of exaltation.
3. The term "liturgically oriented denominations" is used to refer to churches whose services make use of archaic language, gestures, and rites to create a sense of the sacred.

Case Study 8.3
Cemeteries of Southern Manitoba

James W. Darlington

Of the three principal rites of passage in western society — birth, marriage, and death — only death is clearly and consistently marked on the land.[1] For centuries burial has been the standard method of disposing of the dead in western society, making cemeteries and other human burial sites one of the most commonplace elements found in the North American cultural landscape. But for all their frequency of occurrence, very little systematic research has been conducted to explain their location or distribution.[2] Although in southern Manitoba the location of over 1,600 such burial grounds has been recorded,[3] it is likely that many more small, in some cases unmarked, gravesites exist.

The occurrence of burial grounds varies tremendously within the province, ranging from a high of 189 in the rural municipality of Rhineland to a low of only 2 in both rural municipalities of Arthur and Glenwood. There is no simple formula or set of factors to explain the discrepancies. Following the logic that more people will die and be buried where more people live, then the size, density, and distribution of the resident population are part of the equation. Longevity of settlement and past as well as present settlement patterns are important. Ethnic and religious composition, value and use of land, and local cultural practices complicate the situation further.[4] These elements are not all equally important in any given locale, as illustrated by a few

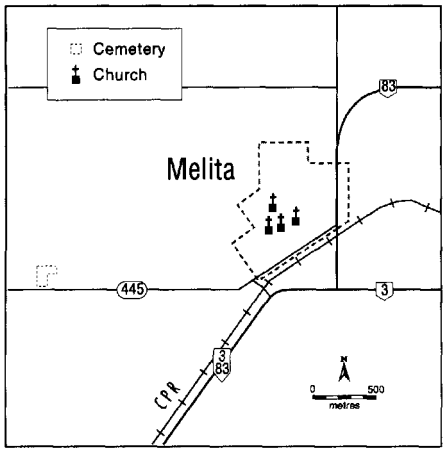

Figure 8.3.1 Location of the Cemetery of Melita

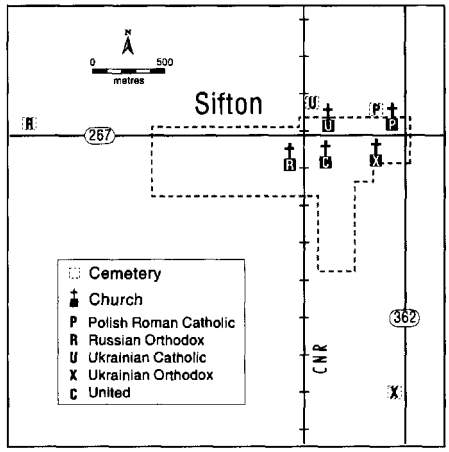

Figure 8.3.2 Location of the Cemeteries of Sifton

examples of cemetery distribution in various locations in southern Manitoba.

The city of Winnipeg illustrates well the nature and location of burial grounds normally associated with large urban centres. Because it is one of the oldest continuously occupied sites of European settlement in western Canada and has an ethnically and religiously diverse population that exceeded 650,000 in 1991, it is not surprising that 29 cemeteries are located within, or immediately adjacent to, the city boundaries. The earliest of these date from the first half of the 19th century and are graveyards immediately adjacent to a church, such as St. James's and St. John's Anglican cemeteries.

As Winnipeg grew in cultural diversity, various ethnic and religious groups established cemeteries for their exclusive or near-exclusive use. Thus, within the city of Winnipeg are burial grounds set aside for specific nationalities (Belgians, French, and Poles) and specific religions (Anglicans, Jews, Presbyterians, and Roman Catholics). High urban land values have almost certainly helped discourage other ethnic or religious groups from following the same practice within city limits. Land value is also reflected in the size, location, and date of establishment of the Winnipeg cemeteries. The older, smaller burial grounds are situated closest to the city core, while the larger, more recently established ones are located near the margins of the built-up area, where land prices were lower when the land was purchased.

There is also a marked contrast in the landscapes of the old and new. During the first half of the 19th century, burial grounds were seen simply as a place in which to dispose of the dead, and little thought was given to landscaping. By the end of the century, public attitudes had changed, so that the middle and upper social classes wanted their loved ones buried in places that were close to nature and aesthetically pleasing. Brookside and Elmwood cemeteries are good examples of this type.

In the present century, the public attitude towards death and burial changed again. Death became a topic of distaste, so anything that reminded people of their own mortality was avoided as much as possible. One consequence has been a shift to far less conspicuous ground-level grave markers and to cemeteries that strongly encourage, or in some cases require, this type of marker. The result is a cemetery that from a distance looks like a large lawn, such as Green Acres or Chapel Lawn.

The situation is decidedly different in the rural districts, where variation in cemetery occurrence is more apparent. In the southwestern corner of the province, for instance, where population density is relatively low and the overwhelming majority of the people are of Anglo-Saxon Protestant background, cemeteries are few and far between. Anglican, Presbyterian, United, and other Protestant church congregations are all well represented, at times within the same town, but since none of these faiths insist that burial sites be consecrated, the same site can be, and usually is, used by all. Instead of being adjacent to one of the churches, the community cemetery is normally located a short distance out of town, where it is equally accessible to members of all faiths (Figure 8.3.1). The graves of the small Roman Catholic population living in the area can be found, in most instances, in a separate section of the larger predominantly Protestant cemeteries.

The situation is much different in the areas dominated by people of Ukrainian and, to a lesser degree, Polish descent. Here ethnic background and incompatible religious practices prompted the establishment of numerous burial grounds. Most Ukrainians are members of either the Ukrainian Catholic (Uniat) or Ukrainian Orthodox faiths. Smaller numbers belong to the Independent Greek church, the Russian Orthodox church, or to no church at all. The Poles, on the other hand, are overwhelmingly Roman Catholic. The Catholic and Orthodox faiths all require that burial take place on consecrated ground and that only followers of that particular faith be buried at that site. Thus, each church congregation requires its own cemetery.

This situation is well illustrated by the cemeteries located in and around the village of Sifton (Figure 8.3.2). Historically that community contained five church congregations — Ukrainian Catholic, Ukrainian Orthodox, Russian Orthodox, Polish Roman Catholic, and Presbyterian (later United Church of Canada). Except for the Presbyterians, each congregation established its own cemetery.

The pattern of cemetery distribution is different in yet another way in areas of Mennonite settlement. There, ethnic and religious diversity is minimal but the number of cemeteries is high. The rural municipality of Hanover, whose boundaries coincide with those of the original Mennonite East Reserve (Case Study 7.3 on page 105), is as a good example. Today the area remains over 80 percent Mennonite. Despite this, it contains 43 Mennonite cemeteries plus numerous burial sites (Figure 8.3.3).

This unusually large number of cemeteries is closely linked to the traditional Mennonite practice of settling in farm villages. Although

none remain today, at one time or another the East Reserve contained 34 *strassendorf,* or street villages. Twenty of these communities had their own cemetery.[5] In addition, in more recent years a number of schisms have taken place within the Mennonite church. This has led directly to the proliferation of church congregations, some of which have established their own cemetery.

These four examples provide some insight into the factors that have contributed to the uneven distribution of cemeteries and burial sites in southern Manitoba. No doubt the list extends well beyond what has been presented here. At present, however, a comprehensive explanation of burial ground distribution or of how specific sites come to be selected awaits more thorough investigation.

NOTES

1. W. Zelinsky, "Gathering Places for America's Dead: How Many, Where, and Why?" *The Professional Geographer* 46, 1(1994):29–38.
2. L.W. Price, "Some Results and Implications of a Cemetery Study," *The Professional Geographer* 18, 4(1966):201–7.
3. K. Stokes, *Carved in Stone: Manitoba Cemeteries and Burial Sites* (Winnipeg: Manitoba Genealogical Society, 1990).
4. W. Zelinsky, "Unearthly Delights: Cemetery Names and the Map of the Changing American Afterworld," in *Geographies of the Mind,* ed. D. Lowenthal and M.T. Bowden (New York: Oxford University Press, 1976), 171–95.
5. J. Rempel and W. Harms, *Atlas of Original Mennonite Villages on the East Reserve, Manitoba* (Altona, MB: privately printed, 1988).

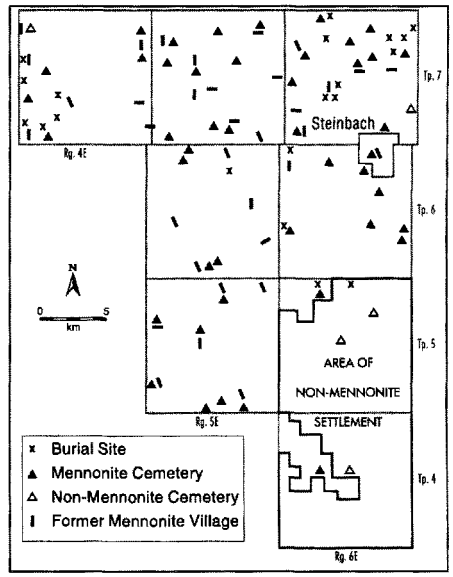

Figure 8.3.3 Cemeteries and Burial Sites in the Rural Municipality of Hanover

ABORIGINAL SETTLEMENT IN MANITOBA

9

Samuel W. Corrigan
Robert C. Annis

The term "Aboriginal" is defined in Canada's Constitution Act, 1982, as meaning the Indian, Inuit, and Métis people.[1] Permanent residents of Manitoba include both Indian and Métis people who now include representatives of five cultural traditions representing many languages (Table 9.1).

To illustrate, those people who call themselves Anishnaabe generally live in the central and southern forests and parklands. Their language is one of many across North America in the Algonquian family. Both the people and their language are commonly called Saulteaux or Ojibwa in Manitoba. The Dene live in two bands in northern Manitoba. They are hunters, trappers, and fishers for whom the caribou herds, which migrate in the border region between Manitoba and the Northwest Territories, were once of critical importance. Cree and Anishnaabe people are found throughout the forest and parklands areas of Manitoba. Their languages are often the first or "normal" — sometimes the only — languages of the people in their communities. The Dakota people live in five communities in the southern and western part of Manitoba.

In contrast, the Métis people of Manitoba are found throughout the province. Typically they speak the languages of the communities in which they reside. In some areas, this means that older people may still speak Michif — an Aboriginal language developed with several local variations in the 19th century — while younger people use English, French, or an Aboriginal language. Virtually all of the Aboriginal languages are spoken by some Métis, and the Michif language is spoken in numerous dialects reflecting the influences of other Aboriginal languages (Cree or Saulteaux) or French.[2]

The subject of Aboriginal settlement in Manitoba can be conveniently discussed in terms of five time periods. This model generally fits the province as a whole, but is subject to exceptions reflecting both the Aboriginal and geographic diversity of Manitoba. The five periods are:

(1) Pre-1870, which saw the development of a new Aboriginal population, the Métis, in growing conflict with a mercantile colonial regime;

(2) 1870–1912, from the creation of a substantially Aboriginal province of Canada to the extension of Manitoba to its present boundaries (Figure 1.2), a period characterized by the dispersion across the west of some Aboriginal people, the Métis, and the creation of reserve communities for others, the Indians;

(3) 1912–51, an era of significant legal repression and the beginning of major population growth;

(4) 1951–82, a period of Aboriginal emergence and development in both the political and economic facets of Manitoba life; and

(5) 1982 to the present, the era during which Aboriginal people have become constitutionally and legally significant in Canada, and when Aboriginal people have been generally recognized again as a major element of the once-Aboriginal province.

PRE-1870

Table 9.1 Aboriginal Peoples of Manitoba

Common Name	Preferred Name	Language Family	General Location
Chipewyan	Dene	Athabaskan	Northern forest
Cree	Varies with band	Algonquian	Northern forest
Saulteaux; Ojibwa	Anishnaabe	Algonquian	Central and southern forests and parklands
Sioux	Dakota	Siouan	Plains
Métis; Half-breeds	Métis	Varies with area	Throughout province

It is not possible to be certain of the actual numbers, distribution, or languages of the Aboriginal people of Manitoba prior to the settlement by Europeans in the 18th century. Europeans, including Henry Kelsey, had investigated and traded along the west coast of Hudson Bay as early as the 1680s. Churchill was founded about 1716, and later became a major trade centre. By 1738 the French traveller La Vérendrye had had some contact with those people who are commonly called Assiniboine or Nakoda Sioux, and certainly had made some contact with Saulteaux, if not in Manitoba then nearby, in what is now Ontario. Samuel Hearne worked and travelled with people whom we know today as Dene and Cree.

There are only crude estimates of the Aboriginal population at this time. In the early 18th century, all the Aboriginal people in Manitoba were hunters, which means that they lived in small nomadic or migratory family groups. Bison, supported by small game, were an economic mainstay on the prairie. The Siouan people, who hunted across the plains, lived most of the year in bands of rarely more than 200 persons, more commonly only 25–50 persons. Several bands came together occasionally in the spring or summer for social exchange and ceremonies, but large populations could not be easily supported by the game and food available. By the early part of the 19th century, the Anishnaabe people had begun to migrate into the parklands and plains areas of the province from the east, but the land could not support groups of more than a few dozen people together at any one time for more than a short period.

The northern forest hunters were even more limited in terms of the numbers of people who could live and hunt together. Their most common unit of organization was a family hunting group composed of one or two senior male hunters with their spouses and unmarried children, and some married children and their spouses. These groups interacted with each other periodically at certain meeting places, but were unable to function as large groups for more than a short period.[3]

The development of a new and distinct Aboriginal population, now called Métis, appears to have been clear to European observers by the late 18th century. The Métis were the descendants of Aboriginal people and European travellers and settlers, notably the employees of the Hudson's Bay Company. They grew in numbers around the coastal posts of the fur traders and the early-19th-century development at Red River. They began to develop unique social, cultural, and economic characteristics. The Métis people, capable of speaking both European and Aboriginal languages, and presumably able to work easily both with the traders and with Aboriginal groups, became a significant factor in trade and other economic activity.[4]

Some European colonization had been sponsored by the British government in the Red River area early in the 19th century, with the immigration of the Selkirk settlers in 1812. Many Métis, employees of the fur-trading companies or independent traders themselves, viewed this as a threat. Tensions between the Métis and the colonists came to a head with armed conflicts in 1816.

For several decades thereafter, European immigration was virtually nonexistent, but the Métis population grew strikingly. There were many conflicts between Métis and the Hudson's Bay Company, which exercised legal authority in the region. This in turn stimulated a sense of Métis identity and nationalism. The Europeans — especially Hudson's Bay Company employees — were viewed as repressive commercial interlopers, and the Métis viewed themselves as buffalo-hunting carters and traders (Case Study 6.1 on page 89), with a legitimate right to the land and social justice by virtue of their Aboriginal heritage.

The conflict between the Hudson's Bay Company and the Métis came to a head in the case of Guillaume Sayer. He was charged in 1849 with the serious offense of trading in competition with the Hudson's Bay Company. Armed Métis surrounded the building where the trial was held in the Red River Settlement. The jury found Sayer guilty of violating the trade monopoly, but then exercised the wisdom of Solomon by recommending against any penalty! In a single stroke, the trade monopoly was both upheld and demolished. More important, the decision confirmed the power of the Métis as local residents who possessed at least some civil rights.

In 1869 it was proposed that the lands and rights of the Hudson's Bay Company be transferred to the newly confederated Dominion of Canada. Fearing that they would go from being subjects of a corporate colonial government run by the Hudson's Bay Company and administered by local officials in the Red River region, to being colonial subjects of the distant Canadian government run by easterners in Ontario, the Métis people rose up in arms. After some tense moments and minor conflict, negotiators for the Métis, led by Louis Riel, and the Canadian government reached agreement on the creation of the new province of Manitoba, which came into official existence on 15 July 1870.

As part of this constitutional development, the census of 1870 was conducted, using the racial and cultural categories common to the Red River region. This census appears to be the first formal Canadian recognition of Indian and Métis as separate categories of

Table 9.2 Population of Manitoba, 1870 Census

Ethnic Group	Number	%
Francophone Métis	5,757	48.1
Anglophone Métis	4,083	34.1
White European (born in Europe or Canada)	818	6.8
White European (born in the Northwest)	747	6.2
Indian	558	4.7
Total	11,963	99.9

Source: Adapted from J.H. Legasse, ed., *A Study of the Population of Indian Ancestry Living in Manitoba Volume I* (Winnipeg: Department of Agriculture and Immigration, 1959), 52, 53.

Aboriginal people (Table 9.2). It is easy to understand why many Aboriginal people believe very strongly in the principle of Aboriginal rights when one realizes that 87 percent of the population of the new province of Manitoba was Aboriginal.

One curious item shows up in the census, namely, the 558 people classified as "Indian."[5] Until recent decades, Aboriginal people did not speak of themselves either as Aboriginal (or "Indian" or "Native") or even as a single group. Indeed, such terms were developed by non-Aboriginal people. Before the arrival of Europeans and for a long time afterwards, members of Aboriginal groups referred to themselves by local group names. Thus an individual might be a Dene, hunting with particular family members, as distinct from other Dene. Occasionally band-type descriptions might be used, often based upon geographic features of the territory in which the people hunted. Distinctions were also made between people who spoke different dialects and languages. However, Europeans arriving in this region made a clear distinction between themselves and Aboriginal people, and also gradually began to recognize the Métis as a people distinct from Indians, likely in response to the clear economic interests of the Métis as a group.

A number of scholars have written about the evolving social distinctions of the Red River Settlement in the mid-19th century. Indians were found only in small numbers, and they were largely considered to be nomadic hunters. "Europeans" came from Europe or eastern Canada and were exclusively of European ancestry. The Métis, however, were a people whose roots lay in Canada but who possessed some European ancestors. Many people in the settlement were very status-conscious, status being based upon such factors as specifics of ancestry — from what part of Europe or Canada the ancestors came, or from what language or tribal community they were derived, religious background and affiliation, language, education, and employment. Although the growth of a Métis population represented the development of a unique society and culture,[6] recognition of the Métis as a people was — and perhaps still is — a slow and tortuous process.

In 1870, when Manitoba became a province of Canada and a census was necessary, there was no legal distinction between Indian and Métis; indeed, the only federal legislation that defined "Indian" was an 1868 extension of the laws of Upper and Lower Canada. No specific legislation applied to Indians in Manitoba until 1876, and even then the designation "Indian" generally meant people who lived in bands and who had some sort of common land interest. The definition enacted in 1868 also included all spouses and children, all other persons living with Indians, and all descendants of Indians regardless of any European ancestry. It was, in other words, a uniquely cultural definition rather than a narrowly legalistic one.[7] The use of the category "Métis" (or "half-breed," as the Métis were called then) in 1870 was a revolutionary distinction that had significant constitutional implications for both Manitoba and Canada, then and now.

1870–1912

Two themes are evident during this period: (1) the dispersion of the Métis to small, often remote communities; and (2) signing and partial implementation of treaties with Indians (Case Study 9.1 on page 133). This was also a period of developing paternalism and legal repression of Aboriginal people, one that saw new limitations upon Aboriginal movement and opportunity in Manitoba and that set the stage for the problems of legal categorization of Aboriginal people that continue to bedevil governments and individuals today.

In 1763 a Royal Proclamation recognized Aboriginal land rights in North America, declaring that those rights could be surrendered only to the Crown. The nature of those rights, commonly referred to as "Aboriginal title," has still not been clearly defined, but they are believed to be usufructuary rights, or rights of use, as opposed to rights of ownership equivalent to the fee simple[8] holdings of purchasers of land in Canada.[9]

The Canadian government considered Aboriginal title to be an impediment to European settlement in the West. For instance, in 1870 the federal government felt it necessary to move troops to the Red River Settlement at the time of the Métis resistance. Canada was forced to negotiate a temporary right of passage for the troops with the Indians of northern Ontario, thus recognizing Aboriginal interests in the land. This temporary measure was replaced in 1871 by a permanent right of passage — but not settlement — for all non-Aboriginal travellers.

The Manitoba Act, 1870, which created the province of Manitoba, included the formal acknowledgement of land rights for Métis, rights founded upon their Aboriginal heritage. It was considered "expedient, towards the extinguishment of the Indian title to the lands in the Province, to appropriate a portion of such ungranted lands, to the extent of one million four hundred thousand acres thereof, for the benefit of the families of the half-breed residents."[10] Thus, approximately 20

percent of the land of the new province was reserved for the Métis as part of the legal recognition of their Aboriginal title.

It follows logically that the only other Aboriginal people of Manitoba at the time — Indians — should also be granted land in exchange for the surrender of their title. This process began in 1871 with the negotiation of what is now called Treaty 1 (Case Study 9.1 on page 133). Over a one-week period, government representatives met with Saulteaux and Cree Indians to hammer out the details. Treaty 1 was later amended, but as Hall points out in a cogent review of the discussions, "the Indians not only forced major changes in the government's plan, such as it was, but raised most of the issues that appeared in subsequent treaties; in its process, form and broken 'outside' promises, Treaty 1 had a major impact on future treaty negotiations."[11] Further treaties followed in the next several years (Figure 9.1).

Although subject to variation, these treaties contained similar provisions. In each case Indians agreed to cede to the Queen (Victoria) and her successors all the lands included within the treaty boundaries. In return, they were to receive specific payments upon signing, ranging from cash to clothing to ammunition; annual cash payments to each individual (generally $5 per year, a considerable sum at the time); agricultural assistance, including tools and livestock; schooling; some other ongoing assistance such as a supply of ammunition; and reserve land in an amount based upon population and ranging generally from 32 acres (13 ha) per person to 128 acres (52 ha) per person. This reserve land could be sold or leased to the government with the consent of the Indians, but could not otherwise be alienated.

A few groups of Indians in Manitoba are not covered by treaties in this province for specific reasons. The Dakota people of the southwestern part of the province, for example, were denied treaty rights on the grounds that they were American Indians! They were fully acknowledged as Indians under the Indian Act and were given five small reserves, by "grace of the Crown," the government having decided in the 19th century that they settled in what is now Manitoba only after signing treaties in the United States. This is part of the problem of nomadic people gradually settling at fixed points; in this case, the Dakota hunted across the northern plains, were first contacted for treaty and settlement by Americans in Minnesota, and then moved to Canada, another part of their historic land-use territory.

The basic treaty process involved minimal negotiations between government and Indians leading to the surrender of the land rights ("Aboriginal title") of the Indians to a defined area, which were given to the Crown in exchange for certain benefits and a unique kind of recognition. Following the signing, government surveyors laid out reserves that became the homes of particular bands. This worked reasonably well in the southern and central parts of the province, with most reserves established relatively soon after signing.

In northern Manitoba, however, the Indians were often either "migratory" or "nomadic,"[12] and there did not seem to be any need to survey reserves immediately. The Indians worked from central points, generally fur-trading posts with minimal government or missionary services, and surveying permanent reserves, especially given the large size necessary to meet treaty obligations, appeared pointless for hunting and trapping people who occasionally had to make major moves for economic reasons. The failure to survey and allocate the promised reserves became a controversial issue in the 1970s and 1980s, and is only now being resolved in the 1990s.

Many Aboriginal people held high hopes for the future prosperity and stability of the new province; Aboriginal land rights had been recognized, the titles to lands held over many decades could now be confirmed, and the rights of the Métis majority were enshrined in a nonamendable constitution, guaranteed by Great Britain. Such hopes were soon dashed, however. Far from being a period of happiness in which they and their rights were respected, the decade that followed the negotiated settlement was a disaster for Aboriginal people, characterized by rampant racism, extreme privation, and broken promises galore.

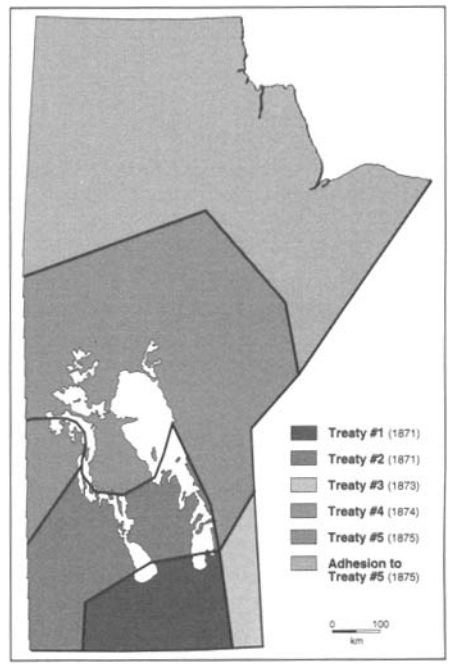

Figure 9.1 Approximate Area Covered by Treaties 1 to 5

First, although the Métis were promised one-fifth of the land of the "postage stamp province," both the legislation and the regulations actually affecting the distribution were an administrative nightmare.[13] By the time any land was actually distributed, many Métis had left the region as part of a dispersion that saw significant migration west and north.

There are several explanations for this. Much of it stemmed from poverty and economic change as both the buffalo trade and the fur trade declined in the Red River area; much was due to a developing prejudice and racial bitterness in the community as the population balance shifted from being predominately Aboriginal, especially Métis, to non-Aboriginal, especially people from southern Ontario; and some probably reflected either new economic opportunities through the sale of previously owned land or general dissatisfaction with the changing political and social scene.

For whatever reason, the Métis population declined from its 1870

peak of 9,840 to fewer than 8,000 in 1886 in a province of considerably greater area. Meanwhile, the total population of Manitoba rose from 18,995 in 1871 to 65,954 in 1881 and 152,506 in 1891, making the Métis very much a minority. Finally, in the 1870s and 1880s the distribution of the Métis lands made a mockery of any sense of either administrative sanity or judicial fairness. By 1912 relatively few of those Métis who should have received land had either actually acquired title or retained what land they did manage to acquire.[14]

For Indians, the repression of this period was prescribed by law. After 1874, when federal Indian legislation began to be applied in the West, Indians gradually became subject to the same laws that applied to Indians elsewhere. These included everything from strict morals regulations — such as total prohibition of alcohol — to increasingly rigid definitions of who was and who was not an Indian. Children were required to attend schools taught by non-Aboriginal teachers using non-Aboriginal curricula. Very often they were forced to attend residential schools great distances from their homes, not necessarily because of the lack of schools on reserves, but often as a blatant attempt to separate children from Indian influences and to raise them to be non-Aboriginal. Laws prohibited numerous Indian ceremonies that were believed to be criminal (for example, ceremonies involving the giving of gifts were considered wrong, unless they occurred in the context of Christian festivals!), and elements of Aboriginal spirituality were frowned upon and often made illegal. It was even made illegal to sell ammunition to these hunting people without permission.[15]

The year 1912 marked the extension of Manitoba to its present boundaries (Figure 1.2 on page 5). In the previous 42-year period, the Aboriginal people of the region had: (1) created a province and been assigned 20 percent of its land base; (2) either never received or else lost much of that land; (3) entered into treaties leading to the creation of reserves for some but not all; (4) seen much of their economic life turned into shambles; and (5) in the case of Indians, begun experiencing much of the legal, economic, and political repression that was to characterize Aboriginal life for the following 70-odd years.

1912–51

Even though Manitoba grew from the "postage stamp province" to a substantial size (Figure 1.2), no greater proportion of land became available for Aboriginal people. Métis communities still existed in many parts of the province, but large numbers disappeared during the lean days of the Depression. In some cases this was because they were unincorporated and the residents were considered squatters; consequently their land could be used for whatever purpose government chose.

The Métis village of Ste. Madeleine was an example of what could happen. A tiny community near St. Lazare, in western Manitoba, it was first settled at the turn of the century. A church was built in 1913 and a school in 1922. By the mid-1930s some 250 people lived there, the men working as itinerant farm labourers. They did some farming in the community and had a few cattle, but relied upon their labour for money to pay taxes. Between 1935 and 1938 few people could afford to keep up their taxes; most were then considered squatters on the land. The Prairie Farm Rehabilitation Administration (PFRA) decided to use the land for a community pasture. At a time when many people were away working and only the elderly and children were at home, the PFRA bulldozed the homes and church. The people were scattered, largely without compensation. Many of the workers returned to find their families, their homes, their community literally gone! By 1938 Ste. Madeleine was just a memory. In other cases, small towns and hamlets declined until the last residents moved to other communities, a process common to all rural areas of Manitoba.

For Indians, legal repression continued as stricter laws and ever more complicated administrative procedures were introduced. A number of measures were taken to control the Indian population, both by reducing their numbers and by imposing travel restrictions. The legal definition of "Indian" became more complex and restrictive, and many persons who considered themselves Indians were suddenly declared not to be so! Sometimes this came about through enfranchisement, a policy under which Indians could become full legal persons rather than wards of the government. This could be by choice, although at times it occurred involuntarily. In the 1880s, for example, any Indian who obtained a university degree was automatically declared enfranchised and ceased to be an Indian.[16] Others had their status as Indians taken away on the spurious grounds that they really ought to be Métis and that their listing as Indians was all an error!

In spite of many problems, including emigration to the west, disease, and sometimes malnutrition and neglect, the Aboriginal population of Manitoba began to grow in the second quarter of the century. The Indian population, for example, rose from 11,675 in 1924 to 17,549 in 1949. Although this represented an increase of only 50.31 percent over a 25-year period, a figure that would be considered modest today, it was a dramatic improvement over the previous half century, when populations had actually declined.[17]

1951–82

Many of the gradual and progressive changes that affected Indians in Manitoba during this period also applied to Métis and non-status Indians in the province. This was a time of increasing awareness of the need to support small communities as new services and opportunities arose. Although many settlements and villages declined in population, others grew to become regional service centres (Chapter 11). Community development programs, designed to help people take full advantage of services in such areas as education, economic development, and community infrastructure, targeted many Métis regions of the province. Many areas of the north

became accessible by road, and more predominantly Aboriginal communities were able to manage more of their own affairs.

Awareness and education played roles in allowing Aboriginal people to move towards practical equality with non-Aboriginal people. Métis and non-status Indian political and service organizations began to receive federal and provincial funding in the 1960s, and were soon able to take new initiatives in such areas as housing and business development. In addition, the proportion of Aboriginal people in urban areas began to climb. The province of Manitoba began to make per capita financial grants to Indian bands as a means of recognizing both their residence in the province and the fact that Indians paid taxes off reserves.

In 1958 one major study found only 2,373 Indians in Manitoba settled in towns and cities, fewer than 11 percent of the Indian population.[18] A second study of 23,579 Métis (the Department of Agriculture and Immigration estimated a probable Métis population of between 100,000 and 200,000) revealed that fewer than 5,100, or less than 25 percent, were located in the six largest centres of the province.[19]

In contrast, by 1980 the federal government estimated a population of 15,000–20,000 Aboriginal people in Winnipeg alone, with substantial numbers in other urban communities.[20] By 1991 a new report using statistical analyses concluded that Manitoba had an Aboriginal population of 130,000 people, 11.8 percent of the total provincial population. Some 41,000 (31 percent) resided in Winnipeg, constituting 6.5 percent of that urban population.[21] Because both the birth rate and the proportion of Aboriginal population under 15 is twice as high as in the non-Aboriginal population, these proportions are likely to increase considerably over the next several decades.

1982–94

The year 1982 was a watershed in Aboriginal/non-Aboriginal relationships in Canada. In that year Canada's Constitution was "patriated," which simply means that the various British and Canadian documents that made up part of our Constitution all became part of Canadian legislation. New elements were added to the Constitution as well, including one provision that was to have a dramatic impact upon Aboriginal life in Canada. Although several new sections refer to Aboriginal people, one in particular caught the public imagination and became one of the most cited elements of our law: "The existing aboriginal and treaty rights of the aboriginal people of Canada are hereby recognized and affirmed."[22]

Although the long-term effects of this clause are not yet fully understood, it has so far led the courts to examine a number of issues — such as hunting and fishing rights and such features of treaties as unclaimed land — in a new light. Essentially, it has been interpreted to mean that any benefit promised in a treaty is now constitutionally protected and can be infringed upon, or limited, only if necessary for the application of other parts of the Constitution. As many provisions of treaties, and some things that are believed to be Aboriginal rights (such as certain land rights), have been severely restricted in the past by a combination of government regulations and bureaucratic convenience, this provision could have far-reaching consequences.

For example, treaties gave Indians the right to hunt and fish for food, but in the past, laws, regulations, and bureaucratic practice dictated that such food could neither be sold nor given away. Now the constitutional protection of the treaty right supersedes those arbitrary rules. In turn, of course, that protection drives Aboriginal and non-Aboriginal governments to negotiate the joint planning and management of many resources.

A further change in the Constitution, that of gender equality, affected Indians by requiring the federal government to remove gender discrimination from the Indian Act.

A third feature of this Constitution is a definition of "Aboriginal" to include "Indian, Métis and Inuit." For the first time, those Aboriginal people not entitled to Indian status were recognized specifically in the Constitution. The old British North America Act of 1867 had recognized "Indians," but the courts had restricted the term to mean people of Indian status and Inuit.[23] Métis and non-status Indians, now a majority of Aboriginal people in Canada, had been effectively left out of any constitutional consideration.

An important change of this period stems in part from the impetus of the Constitution, in part from a remarkable rise in educational standards among Aboriginal people, leading to a highly skilled and articulate leadership, and in part from the growing awareness by non-Aboriginal Canadians of the Aboriginal basis of Canada, and especially of Manitoba. The basis of this change lay in a series of public protests in the late 1960s and early 1970s over Aboriginal land rights in Manitoba, Quebec, and the Northwest Territories. Surveys in the 1970s showed that Canadians as a whole were supportive of development in the North, but only after Aboriginal claims were settled.[24] It is clear that when Canadians become familiar with the issues, and especially the unfulfilled promises, broken treaties, and unsettled claims of Aboriginal people, they insist that government act in accordance with Canadian law to deal with these issues.

The constitutional changes of 1982 also included provisions for First Ministers meetings with Aboriginal leaders to discuss Aboriginal rights and Aboriginal self-government. Although the meetings seemed to be failures in that no real accords resulted, Canadians as a whole made it clear that the democratic principle of communities taking responsibility for themselves, and being allowed the appropriate tools to do so, must apply to Aboriginal peoples as well as others.

As Canada moves towards the turn of the 21st century, all governments — federal, provincial, and territorial; Aboriginal and non-Aboriginal — are turning more and more to formal discussion and negotiation to resolve disputes. As populations have grown and services have become more complex, the problems that confront local com-

munities and regional and national governments have become thornier. Over the past 25 years, Aboriginal leaders, Aboriginal governments, and Aboriginal claims of various kinds have gradually been recognized by Canadians as a whole. The federal government and the courts began this process of recognition in the 1960s. By 1982, in response to public demand, the constitutional basis of Canada was changed so as to recognize Aboriginal people as integral to Canada. Increasingly the courts, through constitutional decisions, and governments, through negotiation, are coming to acknowledge the role of Aboriginal Canadians in general, as well as the importance of Aboriginal Canadians in the founding of Manitoba.

In Manitoba a number of developments point both to our Aboriginal past and to the clear need for Aboriginal communities to be able to manage their own affairs. The provincial government, for example, is implementing an Aboriginal justice system, using its powers over the administration of justice and Criminal Code provisions that have always allowed community participation. A variety of joint-management arrangements are now in place, and work continues on resolving land claims and other disputes.

It is obvious that both the government of Manitoba and the non-Aboriginal communities of this province now fully recognize the Aboriginal fact in Manitoba, 125 years after Aboriginal people fought for, and won, provincial status for Manitoba within Canada.

NOTES

1. The following terms are used in the Constitution Act, 1982:

Indian. This refers only to people who qualify for registration as Indians under the Indian Act. Although the term has changed in meaning many times over the years, Indian status can now be acquired only by birth through at least one Indian parent, and lost only through death.

Métis. This term has also undergone many changes of meaning over the years. Generally it refers to persons of mixed ancestry who are politically represented by several major organizations. In Manitoba, the Manitoba Métis Federation is the primary voice of the Métis people. The federal government has now decided to list all Métis, although the criteria to be used are not clear as of 1994.

Inuit. Formerly called "Eskimo" by non-Aboriginal Canadians, these northern people were recognized as constitutionally similar to Indians in 1939.

Several other terms are commonly used to designate persons of Aboriginal ancestry. These include:

Non-status Indian. These are persons who were at one time entitled to be registered as Indians but are no longer so entitled because of previous legal definitions, or persons who are currently eligible for registration but choose not to register. Until recent years, the non-status Indians of Canada were often classified with Métis for political purposes. Now they are generally represented by their own organizations.

Treaty Indian. This refers to Indians entitled to benefits under treaties, such as the treaties in Manitoba (Case Study 9.1 on page 133). Although most Indians in Manitoba, except the Dakota, are beneficiaries under treaties, this is not the case nationally: only about one-half of Indians are subject to treaty. There are few treaties in some parts of the country, such as British Columbia and Quebec.

2. J. Crawford, "Speaking Michif in Four Communities," *Canadian Journal of Native Studies* 3, 1(1983):47–55.
3. Details of organization are provided for most northern forest hunters in the Smithsonian Institution's *Handbook of North American Indians, Volume 6, Subarctic* (Washington, DC: Smithsonian Institution, 1981).
4. A.S. Lussier and D.B. Sealey, eds., *The Métis: Canada's Forgotten People* (Winnipeg: Manitoba Métis Federation Press, 1975).
5. The small number of people counted as Indian in the census probably reflects the fact that the census took place before any Indian treaties were signed in the area. Thus the term "Indian" referred primarily to the relatively few people who were judged to be persons "belonging to the tribe, land or body of Indians" interested in particular lands. Very few settlements of Indian farmers were found in the Manitoba of the period. All other Aboriginal people were likely considered to be Métis.
6. S. Van Kirk, *"Many Tender Ties": Women in Fur Trade Society, 1670–1870* (Winnipeg: Watson and Dwyer Publishing, 1980); J.S.H. Brown, *Strangers in Blood: Fur Trade Company Families in Indian Country* (Vancouver: University of British Columbia Press, 1980); and J. Peterson and J.S.H. Brown, eds., *The New Peoples: Being and Becoming Métis in North America* (Winnipeg: University of Manitoba Press, 1985).
7. For a detailed discussion of the development of definitions, see *Historical Development of the Indian Act* (Ottawa: Department of Indian Affairs and Northern Development Policy, Planning and Research Branch, 1975), and J. Sawchuk, ed., *Readings in Aboriginal Studies, Volume 2: Identities and State Structures* (Brandon: Bearpaw Publishing, Brandon University, Department of Native Studies, 1992).
8. Although there was always a considerable variation of land use and land right patterns among Aboriginal people in what is now Canada, the Privy Council of Britain held that Aboriginal title was "a personal and usufructuary right, dependent upon the good will of the Sovereign" (1889, 14 App. Cas. 46, page 4 of the Privy Council judgement). Unfortunately, there is little case law in Canada that would explain this phrase. One of the few statements of usufructuary rights was made in part of the judgement in a notable Aboriginal title case — *St. Catherine's Milling.* Mr. Justice Strong of the Supreme Court of Canada wrote in 1887 that such title "was one which . . . [would] . . . protect the Indians in the absolute use and enjoyment of their lands" while not allowing them to sell that land to anyone but the Crown (1887, 13 *Supreme Court Reports,* page 608). In other words, in very general terms only, usufructuary right allows only a *right of use* in contrast to ownership in fee simple, which allows a *right of sale.* All of these are discussed in full in P.A. Cumming and N.H. Mickenberg, eds., *Native Rights in Canada: Second Edition* (Toronto: General Publishing Co., 1972), chs. 4 and 5.
9. The whole issue of the nature of Aboriginal title is controversial and very much subject to continuous reinterpretation through the courts, stemming in part from constitutional changes in 1982 that recognized "the existing Aboriginal treaty rights and peoples"; T. Isaac, "Balancing Rights: The Supreme Court of Canada, R.V. Sparrow and the Future of Aboriginal Right," *Canadian Journal of Native Studies* 13, 2(1993):201–23. For a good outline of important legal cases in the history of Aboriginal rights in Canada, see P. Kulchyski, *Unjust Relations: Aboriginal Rights in Canadian Courts* (Toronto: Oxford University Press, 1994).
10. Section 31, 33 Victoria (1870) Cap. 3 (Canada). An Act to Amend and Continue the Act 32–33 Victoria chapter 3; and to Establish and

Provide for the Government of the Province of Manitoba (the Manitoba Act, 1870). A year later the British government validated this legislation through what is now known as the Constitution Act, 1871. That constitutional document was subsequently included in the schedule to the Constitution Act, 1982, and remains part of our constitution. It includes a section that prohibits Canada from altering this provision of our constitution. This, of course, is now subject to review in the courts, for which see S.W. Corrigan, "Some Implications of the Current Métis Case," in *The Struggle for Recognition: Canadian Justice and the Métis Nation,* ed. S.W. Corrigan and L.J. Barkwell (Winnipeg: Pemmican Publications, 1991), 195–206.

11. D.J. Hall, "A Serene Atmosphere? Treaty One Revisited," *Canadian Journal of Native Studies* 4, 2(1984):324.
12. Patterns of Aboriginal settlement in Manitoba can be seen in terms of three concepts: nomadism, migration, and concentration. "Nomadism" refers to unscheduled movement over a territory in search of food, such as is common with hunting people; "migration" refers to set movement between or among specified points on a regular basis, as is the case with trapping people who follow scheduled routes; and "concentration" refers to the settlement of people at one point for extended periods of time. These patterns can, of course, be combined; here we are concerned only with the predominant general patterns of Aboriginal people in Manitoba. All three are responses to particular economic and environmental conditions. Except during one period, they represent the best efforts of Aboriginal adults to provide as handsomely as possible for their families as conditions changed over a century and a half. The exception was a "dark period" for Indians in the southern part of the province during a time of major legal repression beginning in the late 19th century and lasting until 1951, when people had relatively few choices in many areas of life because of Department of Indian Affairs restrictions. These settlement patterns varied between north and south, roughly between forest and plain, and by time period, but they provide a guide to significant changes in Aboriginal settlement of Manitoba over the years.
13. Both Manitoba and the Manitoba Act, the constitution of the province, were originally creations of the federal government of Canada. Uncertain whether Canada had the legal authority to create a new province, the British government passed its own version of the Manitoba Act, thus making it constitutional in nature. Still in effect, that version includes a clause preventing any changes of substance to it. The Manitoba Métis Federation, the recognized representative of the Métis people of the province, has a suit in the Court of Queen's Bench in Manitoba. They claim that a series of different laws, orders-in-council (cabinet orders), and regulations of both the federal and provincial governments had the effect of changing the substance of the Manitoba Act, and that those changes deprived Métis people of the land rights specified for them in the Manitoba Act. If this is so, they claim that those changes would be null and void because the Manitoba Act cannot be changed in that way. The case, which began in 1985, will take years, perhaps decades, to reach a conclusion, but is considered vital by many Métis people. For further information and a summary of the case, see Corrigan and Barkwell, *The Struggle for Recognition,* 7–37.
14. Corrigan and Barkwell, *The Struggle for Recognition.*
15. D. Smith, *Canadian Indians and the Law* (Toronto: McClelland and Stewart, 1975), has provided a compendium of major laws applying to Native people. Such a collection makes clear the astounding distinctions that governments have made between Native and non-Native people. For example, in 1994 it was still against the law to have a day school on an Indian reserve in Canada that was not associated with a particular religion. Indians are the only people in the country who are required by law to have schools associated with a religion.
16. Canada, Department of Indian Affairs and Northern Development, *The Historical Development of the Indian Act* (Ottawa: Department of Indian Affairs and Northern Development Policy, Planning and Research Branch, 1975).
17. J.H. Legasse, ed., *A Study of the Population of Indian Ancestry Living in Manitoba,* 3 vols. (Winnipeg: Department of Agriculture and Immigration, 1959).
18. It is extremely difficult to estimate the numbers of Aboriginal people in Manitoba, as in other areas. In part this is because people can only really identify *themselves* as Aboriginal, and in part because record-keeping for all people is haphazard at best. J. Hull, "1981 Census Coverage of the Native Population in Manitoba and Saskatchewan," *Canadian Journal of Native Studies* 4, 1(1984):147–56, outlined many of the problems involved in these counts. Just one example will suffice here. There are at least three possible counts of status Indians in Manitoba: (1) Indian Affairs records (such as treaty and band lists), (2) Statistics Canada records (such as census figures), and (3) provincial records (such as health care registrations). The latter are most accurate, but never up-to-date, as some children may not be added to the lists until they need hospital care; census completion rates on northern reserves are often minimal, and thus wholly unreliable although known to be under-reported; and treaty and band lists often do not have off-reserve members added until the parents of children seek benefits for them. Thus, even where there are supposedly several lists, the undercounting is considerable. The difficulty of counting Aboriginal people, such as Métis, for whom there are few, if any, lists is even greater.
19. By the early 1990s scholars had begun to argue in earnest over different means of counting Aboriginal people. Many people began to seek new ways to ensure accuracy in these counts. R.E. Wright investigated the value of census data in "Using Census Data to Examine Aboriginal Issues: A Methodological Note," *Canadian Journal of Native Studies* 13, 2(1993):291–307. See also Legasse, *A Study of the Population of Indian Ancestry.*
20. Canada, Department of Indian Affairs and Northern Development, *Indian Conditions: A Survey* (Ottawa: Department of Indian Affairs and Northern Development Policy, Planning and Research Branch, 1980).
21. *Aboriginal Justice Inquiry of Manitoba, Vol. 1: The Justice System and Aboriginal People* (Altona, MB: D.W. Friesen and Sons, 1991).
22. 35(1), Constitution Act, 1982.
23. R.J. Diubaldo, "The Absurd Little Mouse: When Eskimos Became Indians," in *Readings in Aboriginal Studies, Vol. 2: Identities and State Structures,* ed. J. Sawchuk (Brandon: Bearpaw Publishing, Brandon University, Department of Native Studies, 1992), 39–50.
24. R. Gibbins and J.R. Ponting, "Prairie Canadians' Orientations Towards Indians," in *One Century Later: Western Canadian Reserve Indians Since Treaty 7,* ed. S.A.L. Getty and D.B. Smith (Vancouver: University of British Columbia Press, 1978), 82–102.

Case Study 9.1
The Indian Treaties and Reserves
Samuel W. Corrigan and Robert C. Annis

Numerous treaties were concluded with Indians by Canadian-based governments before Confederation. In 1850 and again in 1862, the Province of Canada entered into treaties in northern Ontario through a process of negotiation that established a pattern for achieving the surrender of Indian lands to the Crown. This was necessitated by a Royal Proclamation of 1763, a constitutional document that today still forms a primary legal basis for non-Aboriginal recognition of Aboriginal rights.

The Royal Proclamation declared that all land in British North America, apart from certain settled areas and the Hudson's Bay Territories, was reserved for Indians and was not available for settlement by others until "Purchased only for Us, in our Name, at some Public Meeting or Assembly of the said Indians, to be held for that Purpose by the Governor or Commander in Chief."[1] When the government of Canada negotiated the purchase of the Hudson's Bay Territories in 1868–69, there was some concern over who would be responsible for Indian claims.[2] In the end, however, Article 14 of the Imperial (British) Order-in-Council "Admitting Rupert's Land and the North-Western Territory into the Union" settled this matter: "Any claims of Indians to compensation for lands required for purposes of settlement shall be disposed of by the Canadian Government in communication with the Imperial Government; and the Company shall be relieved of all responsibility in respect of them."[3]

The Canadian government was well aware of its responsibility to settle Aboriginal claims; indeed, the Manitoba Act, 1870, recognized the rights of the Métis in several significant ways, and an emissary was sent ahead of the Wolseley military expedition to the Red River in 1870 to negotiate a right of passage for the troops through Indian land. Later, in 1871, that right was expanded by negotiation to include all non-Aboriginal persons.[4]

In 1871, spurred by Indians themselves, treaty negotiations began between several groups of Saulteaux and Cree Indians and the lieutenant-governor of Manitoba and a federal Indian Commissioner at the Stone Fort, now the Lower Fort Garry historic site north of Winnipeg. As Hall notes, the negotiations were both lengthy and difficult.[5] It would appear that the government negotiators were unprepared for either the extent of Indian demands or the determination of Indians to pursue their interests.

Finally, after considerable compromise over six days of actual negotiations, Treaty 1 was signed on 3 August 1871 (Figure 9.1 on page 128). It surrendered some 16,700 square miles (43,253 km^2) of land, somewhat larger than the province of Manitoba then, in return for a one-time-only present of $3 per person; an agreement to maintain schools on reserves, the latter to be created on the basis of 32 acres (12.9 ha) per person; a prohibition on the sale of liquor on reserves; and $3 per person annual annuity ("treaty money"). This was followed less than three weeks later by the signing of Treaty 2, which arranged the surrender by Saulteaux Indians, on the same terms, of an even larger territory to the west and north of the province.

By 1873 the treaty-making process for the Prairie provinces was well under way. Treaty 3, with Saulteaux Indians in what is now eastern Manitoba and northwestern Ontario, was signed that year. The benefits for Indians were increased, a feature that led to the revision and upgrading of Treaties 1 and 2 in 1875 (to annuities of $5 and the inclusion of a number of verbal promises made in 1871 giving payments to band leaders and granting agricultural implements and livestock to each reserve).

Treaty 4, which involved Cree, Saulteaux, and Assiniboine Indians and which covered a further portion of what is now western Manitoba and much of Saskatchewan, was signed in 1874. Covering some 100,000 square miles (260,000 km^2), Treaty 5 was signed at Berens River, Norway House, and Grand Rapids with Cree and Saulteaux Indians in 1875 and at four other points in 1876. The land surrendered included much of what is now central Manitoba and a part of northern Manitoba. The treaty was notable for including a recognition of Indian hunting and fishing rights. Finally, Treaty 10 was signed in 1906, covering much of northern Saskatchewan and a sliver of what is now northwestern Manitoba.

Not all Indians subscribed to all treaties at the time of the initial signing, and not all treaties provided the same benefits. It was the government's practice to negotiate the basic treaty with a representative group of bands, hopefully a majority, and later secure "adhesions" by other bands whenever possible and/or feasible. Thus the final eight adhesions in northern Manitoba did not occur until 1908, 1909, and 1910, when a total of 133,400 square miles (345,505 km^2) of land was ceded to the Crown.

The original province of Manitoba extended only as far north as 50°30'N until it was extended in 1881 to 53°N (Figure 1.2 on page 5). The district of Assiniboia, an administrative territory of the federal government, was located to the west and north of Manitoba. In 1905 Alberta and Saskatchewan were created, extending north to the 60th parallel. Saskatchewan's eastern boundary followed the short Manitoba western boundary from the 49th parallel to Manitoba's northern boundary, and from there directly north to 60°N.

Treaties and adhesions to treaties were signed with the Crown in right of Canada, that is, the federal government. Provincial and territorial governments could, and can, be involved as observers, but did not, and still do not, have legal rights in these agreements. Thus when the James Roberts Band adhered to Treaty 6 at Montreal Lake in 1889, it was with the federal government. Later, some members separated from the Peter Ballantyne Band, which adhered to Treaty 6 in 1898. Still later, some of their members separated to form the Mathias Colomb Band, and adhered to Treaty 6 in

1910. Many members of this band later moved to new hunting grounds in the east, in land that was added to Manitoba in 1912. It is important to remember that hunters live near game and move with game. These hunters entered a formal legal relationship with the federal government. Later, non-Aboriginal people created new government structures and defined new territorial units on paper, including the province of Manitoba, but these were largely irrelevant to the business of hunting and feeding one's family.

Two bands in Manitoba are actual signatories to Treaty 10. Involving a number of Dene bands, this treaty is said to cede land in northern Saskatchewan. It would appear that the two Manitoba bands, Barren Lands and Northlands, may not have specified the exact territory that they ceded. In particular, they may still have certain traditional hunting rights in that part of the Northwest Territories that is scheduled to become the Nunavut Territory. These hunting rights are subject to negotiation.[6]

There are also some Manitoba Indians who are not treaty Indians. It should be understood that treaties cover only about half of all status Indians in Canada; some areas of the country, such as most of British Columbia, were never surrendered through treaty, although the government considers all of Manitoba to have been surrendered. Five bands of Dakota have reserves in the southern part of the province. They are considered to have this land "as a matter of grace and not of right,"[7] because according to the governments of the 1860s and 1870s, they were signatories to treaties in the United States and were thus initially classified as "refugees."

In accordance with the treaties signed between 1871 and 1910, Indians in Manitoba were entitled to receive land. Generally speaking, most bands in southern Manitoba received allotments of reserve land fairly soon after the treaties were signed, but as of May 1995 not all bands had received the land for reserves that they were promised over a hundred years ago. Some bands, such as the Island Lake Band in the Treaty 5 area of northeastern Manitoba and the Long Plain Band in the Treaty 1 area of southern Manitoba, signed compensation agreements in 1994 for lands promised but not given under their treaties.

The question of reserve land is not a minor one. Indian reserves are lands for which title is held by the Queen for the use and benefit of the bands. They are in essence federal lands, and Indians are free of both provincial and federal taxation on reserves, including most income taxes and all sales taxes. Indians also have a variety of legal protections on reserves; for example, property owned by an Indian cannot be seized from a reserve by a non-Indian.

The most important right attached to reserves, however, is their governmental status. Indian bands have a variety of governmental powers under the Indian Act, and the power to legislate in many aspects of life and to levy property taxes. The reserves provide a significant land base; essentially, they provide homelands and economic resources for Indians. The latter will become increasingly important with the very large outstanding land entitlement of many bands and the strong desire of bands to control and manage significant resources for their future.

NOTES

1. D.S. Smith, *Canadian Indians and the Law* (Toronto: McClelland and Stewart, 1975), 3.
2. D.J. Hall, "A Serene Atmosphere? Treaty One Revisited," *Canadian Journal of Native Studies* 4, 2(1984):323.
3. D.S. Smith, *Canadian Indians and the Law*, 80.
4. D.J. Hall, "A Serene Atmosphere," 323.
5. Ibid.
6. Department of Indian Affairs and Northern Development, *Indian Treaties in Manitoba* (Winnipeg: Department of Indian Affairs and Northern Development, 1984).
7. A. Morris, ed., *The Treaties of Canada with the Indians of Manitoba and the North-West Territories* (Toronto: Belfords, Clarke, 1880), 279.

Case Study 9.2
St. Theresa Point: Band No. 298
Roy Mason and Robert C. Annis

The St. Theresa Point Band is one of four bands in the Island Lake area.[1] It occupies one reserve and holds joint interest in other parcels of land with three related bands in the region: the Garden Hill, Red Sucker, and Waasagomach Bands. The St. Theresa Point Band is signatory to the 1909 adhesion to Treaty 5 (Figure 9.1 on page 133). The group of Island Lake bands also had an outstanding land entitlement claim for most of this century because the reserve land called for under the treaty had not yet been fully allocated; this entitlement was finally settled in February 1994.

The St. Theresa Point Band Reserve is located on the southwestern shore of Island Lake, immediately south of the Waasagomach Reserve[2] (Figure 9.2.1). Thompson is 290 air kilometres to the northwest, and Winnipeg is 467 air kilometres to the southwest. The reserve is not on the Manitoba highway system, and is thus regularly accessible only by air. For this purpose there is a 3,500-foot (1,067 m) gravel airstrip serviced by scheduled flights, as well as dock facilities for float planes. In mid–winter months the reserve is also accessible by winter roads constructed across the lake from Garden Hill and then south along the eastern shore of Lake Winnipeg (Figure 12.2.1 on page 175).

There are approximately 6.2 km of internal roads on the reserve. Movement within the community is sometimes difficult. For example, during freeze-up and spring thaw, when the ice is thin or breaking up, helicopters are the only way to get from the reserve community where everyone lives to the island on which the airstrip has been constructed and where the Northern Store (formerly the Hudson's Bay Company store) is located, with its supplies of fresh food and gas, the mail depot, and banking services. During the rest of the year, this trip is a five-minute

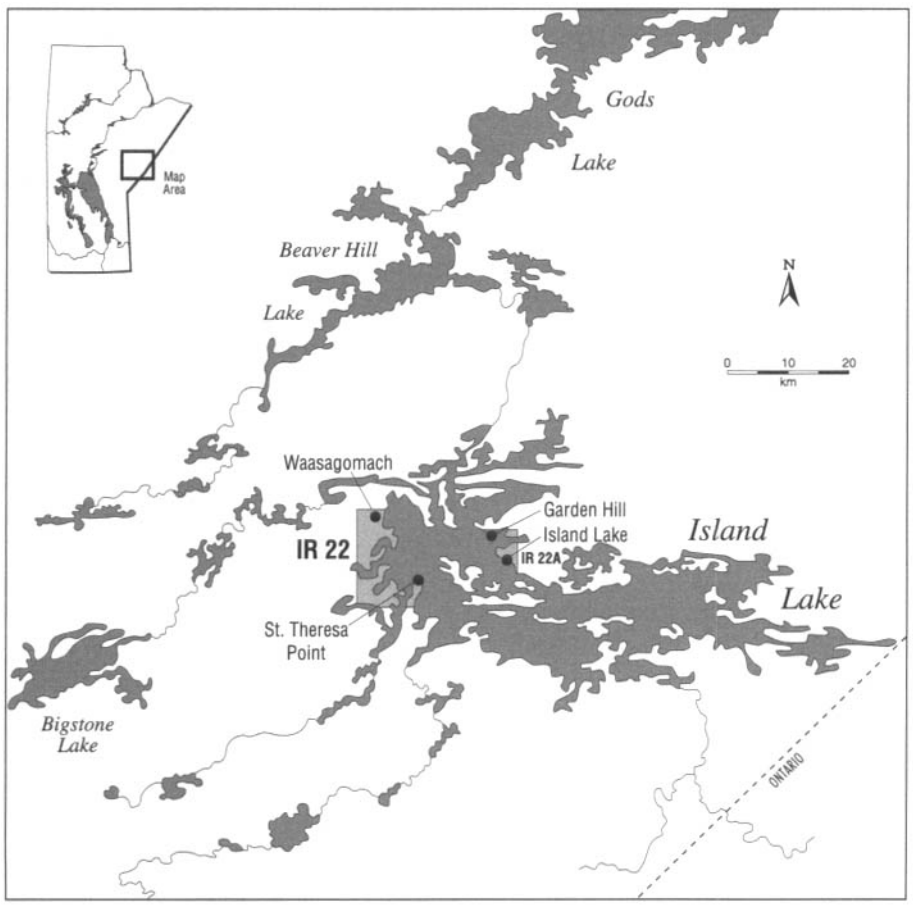

Figure 9.2.1 The Location of St. Theresa Point

boat ride ("water taxi"), weather permitting.

Population, Government, and Community Services

According to the regional population statistics of 31 December 1992, the band has an on-reserve population of 2,092 and an off-reserve population of 119. The native language is Island Lake Cree, which is spoken in most households and is now also taught in the local band-controlled school. The chief and councillors are elected under band custom, a mechanism under which electoral rules are established by the band itself instead of being dictated by the Indian Affairs Branch. Band officials normally serve a two-year term.

On-reserve facilities include a band office, a recreation hall, a Catholic church, and school facilities. Band members generally attend the St. Theresa Point School, which is now completely operated by the band and which offers kindergarten to grade 10 (student enrolment for 1992–93 was 834).

The band employs two band constables. The nearest Royal Canadian Mounted Police detachment is located in Norway House. Hydro service is provided by local diesel-powered generating plants, and mail is delivered two to three times per week. There is a nursing station and a dental station on the reserve, but the nearest hospitals are located in Norway House and Thompson. Two community health representatives are based on the reserve, and ambulance service is provided by the Northern Patient Transport Programme (NPTP).

Infrastructure and Economic Base

The community obtains water from Island Lake. It is chlorinated at the pumphouse and distributed by a standpipe system. The schools, teacherages, and new nursing station obtain water by direct line from the pumphouse. The band office, restaurant, Northern Store, and residences use holding tanks. Pit privies are used by most residents, the band office, and the restaurant, but the schools and teacherages are serviced by a primary sewage treatment plant. All other facilities use septic fields.

The band operates a satellite dish for television reception, and CBC and CKY are rebroadcast in the community. Also broadcast is the band's own television programming, which provides the community with local announcements and Band Council business as well as TV bingo.

The economic base of the community remains commercial fishing and trapping. However, these now provide relatively few jobs. A number of commercial businesses and services are located on, or adjacent to, the reserve, including Bolton Lake Lodge (where visitors can stay), a convenience store, a fur distributor, a firewood operation, and a garage. There is a band-owned construction company, a small privately owned video store, and a sawmill operation. The Northern Store operates the major commercial outlet for food, clothing, and other goods. The store has now been relocated to the reserve, in a large structure called the "complex" that also houses a private store called "Wapisu."

NOTES

1. Indian and Northern Affairs Canada, *First Nations Community Profiles, 1992–1993, Manitoba Region* (Ottawa: Indian and Northern Affairs Canada, 1993).
2. This is the spelling in *Gazetteer of Canada: Manitoba,* 4th ed. (Ottawa: Natural Resources Canada, 1994), 101, but the Indian reserve is often referred to as the Wasagamack Indian Reserve. The preferred name for the St. Theresa Point settlement is now the St. Theresa Point First Nation.

WINNIPEG: HEARTBEAT OF THE PROVINCE

10

Tom Carter

The most important event of 1862 was the actual beginning of the Village of Winnipeg. Just where the fur runners' trail coming down the Assiniboine to Fort Garry crossed the trail running down the Red River . . . in present day Winnipeg the corner of Main Street and Portage Avenue — Henry McKenney built a store.[1]

This was the beginning of Winnipeg, a city that for some time dominated and controlled all of western and northern Canada. Today, with a metropolitan population of 652,354 (1991), it still dominates the province, although in Canada's urban hierarchy it has fallen from the fourth-largest city in 1941 to eighth largest in 1991.

Winnipeg is a city of contrasts and innovation. Hints of the grandeur of an earlier era are seen in a central business district (CBD) much larger than the city's commercial strength can support. It also contains one of the largest remaining warehouse areas in North America representative of the Chicago School of Architecture.

Today the commercial centre struggles to cope with a slow or no-growth economy. Its warehouses have been renovated for other uses or sit empty. Yet the city is still home to state-of-the-art aerospace and garment industries that compete successfully in the world market.

In the political arena, Winnipeg was the first city in Canada to introduce a "Unicity" form of government. In 1971, 11 individual urban municipalities in the metropolitan area were amalgamated under a single administration. In 1981 it embarked on one of the most comprehensive efforts (the Core Area Initiative, or CAI) attempted in Canada to renew the social and physical fabric of a decaying inner city.

The urban landscape also shows extreme contrasts. On Main Street are examples of many problems found in a decaying physical and social urban environment. Winnipeg's North End, an area of low-cost, often low-quality housing with a multicultural population, is often the destination of low-income migrants. At the other end of the scale, the Crescent and Tuxedo areas are high-status, high-income areas, with expensive, high-quality housing.

Today's migrants also enhance the city's ethnic diversity. They come from Southeast Asia, or South America, whereas in earlier years they came principally from northern and eastern Europe. The city today also contains one of the largest and most rapidly growing populations of impoverished Aboriginal people of any city in Canada.

As the turn of the century approaches, Winnipeg has to deal with this contrast or diversity, which can be a source of both strength and weakness. Current and future changes in its economic relationships with its hinterland, the nation, and the world; its rapidly changing demographic characteristics; and an aging infrastructure also present a number of challenges. The ingenuity of its citizens and their innovations have served it well in the past. As a city it must be every bit as creative in dealing with the future.

EARLY SETTLEMENT

In centuries past, the area around the present city of Winnipeg was the domain of Cree hunters. There had been a semipermanent settlement at the junction of the Red and Assiniboine rivers — The Forks — dating back several thousand years. The gathering of native tribes at The Forks attracted the early fur traders, and La Vérendrye built Fort Rouge there in 1738. The site was strategic because the two rivers controlled access to a wide area of Canada's west and north, as well as to the south beyond the present-day American border. The Forks became a staging point where supplies brought via the Great Lakes and Hudson Bay, or later from south of the border, were shipped to points further west and north. Furs from the hinterland of the two rivers travelled the reverse route, with The Forks as a storage and transshipment point, a role that would be Winnipeg's destiny in the future.

Although it appears to have been deserted after two years, Fort Rouge had many successors because both the Hudson's Bay Company (HBC) and the North West Company (NWC) recognized the strategic significance of the site in controlling the fur trade. A number of rival forts were built in the area in the late 1700s and early 1800s, all within the present-day boundaries of Metropolitan Winnipeg — most of them very close to the junction of the two rivers. After the union of the two rival fur-trading companies in 1821, the HBC's Fort Garry, built and occupied in 1822, became the focus of the fur trade for much of western and northern Canada.

The first nonindigenous settlers in the area not associated with the fur trade were the Selkirk settlers of 1812 (Chapter 6). As agriculturalists, they had difficulty becoming self-sufficient, and the powerful fur-trading companies did not take kindly to those "who broke the sod." In 1815 the NWC seduced many back to Canada with a promise of better land. They burned the settlement and those remaining withdrew but returned later, joined by the De Meurons, who were discharged mercenary soldiers. The settlers also battled the environment, facing locust plagues in 1818 and 1819 and the great flood of 1826.

Despite these difficulties, the population continued to grow slowly, even after Selkirk's death in 1820.[2] The settlers' numbers expanded with the retirement of fur traders and their Native families. Their ranks expanded considerably after the 1821 amalgamation of the two fur-trading companies, as the HBC undertook a draconian downsizing of staff and most of those released took land grants and became settlers.

Slow but steady growth continued throughout the mid-1800s, with the increase consisting of Métis, or mixed-bloods (French-speaking Roman Catholics), and country-born (English-speaking Protestants). Despite numerous conflicts over language, religion, and class, a promising multiracial society developed. The settlement's problems were largely economic because of its isolation and attempts by the HBC to control commerce.[3] However, its fortunes gradually shifted from the fur trade to one more closely tied to agriculture, and by the 1860s what was to become the city of Winnipeg began to take shape.

The nucleus of the future city was Henry McKenney's general store, constructed in 1862. However, until 1873, when Winnipeg was incorporated as a city, the settlement remained a relatively unimportant part of the larger Red River colony, comprising the homes and farms of the Selkirk settlers in and around PointDouglas (Figure 10.1) and the buildings of Upper Fort Garry at The Forks.[4] When the first city council meeting was held in 1874, the city had a population of only 3,700 and was little more than a collection of shacks in the area of present-day Portage and Main.

THE EVOLUTION OF DEVELOPMENT

The Boom Years: 1873–1914

Winnipeg's urban landscape was built in the years before 1913 (Figure 10.2) according to a strict pattern determined by history, geography, and economics.[5] The early street pattern was largely determined by the river-lot farming system and the fur-trading routes. Main Street was the trail along the Red River that ran between the Selkirk Settlement and Upper Fort Garry. Notre Dame and all the streets to the north were boundary lines between early lots.

With the arrival of the Canadian Pacific Railway (CPR) in 1881 and the real estate boom of 1881–82, a series of distinctive land-use environments began to emerge, controlled to a large extent by railway development. Different economic activities began to cluster, segregation of people by class and ethnic group became obvious, and the unequal distribution of public services reinforced differences in residential quality. A Central Core, the North End, the South, and the West began to develop as distinctive neighbourhoods.

The Central Core

In the decades leading up to World War I, significant growth spurred by aggressive immigration from other parts of Canada, international conditions that favoured investment, and the export of prairie wheat helped Winnipeg solidify its role as the hub of western settlement and transportation, financial affairs, wholesaling, and grain marketing. Because of the city's role as the national and international link for a vast hinterland, its central business district became a geographically large and financially strong area. The consolidation of this retail and commercial strength occurred at the junction of Main and Portage and on nearby streets and avenues.

In the Central Core, buildings used for banking and the grain trade were concentrated on Main Street, just north of Portage Avenue. Retail activities sorted themselves out along Portage and Main by ability to pay, but were left mainly with those sites that were not demanded by the financial and grain-trade operations. Wholesalers and warehouses were located both east and west of Main. They required a location close to the retail trade, so they located on streets

branching off Portage and Main but avoided the higher land costs along the two major arterials. Spur lines into the heart of this district helped them solidify this position. Light industry (saddleries, printing, and garment factories) was scattered throughout the core. Heavy industry was located in other areas along the railroad or the rivers.

The entire area was strengthened by the Post Office at Main and McDermot, City Hall on the west side of Main between William and Market, and Market Square (a public market) to the west of City Hall. The northern limit of downtown was established by the routing of the CPR through Point Douglas. The arrival of the Northern Pacific and Manitoba Railway (later part of the Canadian National Railway [CNR]) in 1889–90, and the establishment of yard and shop facilities at The Forks — with a station and Grand Hotel on South Main and Water — stretched the CBD southward.[6]

The Central Core was also the location for institutions and clubs (courthouses, government buildings, hospitals, theatres, and prestigious clubs such as the Manitoba Club). Perhaps the most notorious, and no doubt the most frequented, were the hotels, bars, and sex parlours concentrated in areas around the two railway stations. The core area also contained a large number of original fine homes. Although by 1913 the original inhabitants had moved on, these homes continued to command high rents and prices. They did not filter down to low-income residents. In this respect the city did not exhibit a core of poverty in its early years.

Across the Red River from the Central Core, St. Boniface was organized in 1880 and incorporated as a city in 1908. It was, and still is, the centre of French Canadian culture in Manitoba. Some Winnipeg residents and businessmen took advantage of lower land prices and taxes and moved to the St. Boniface side of the river. The landscape was soon dotted with flour mills and abattoirs, and St. Boniface became the city's meat-packing centre.

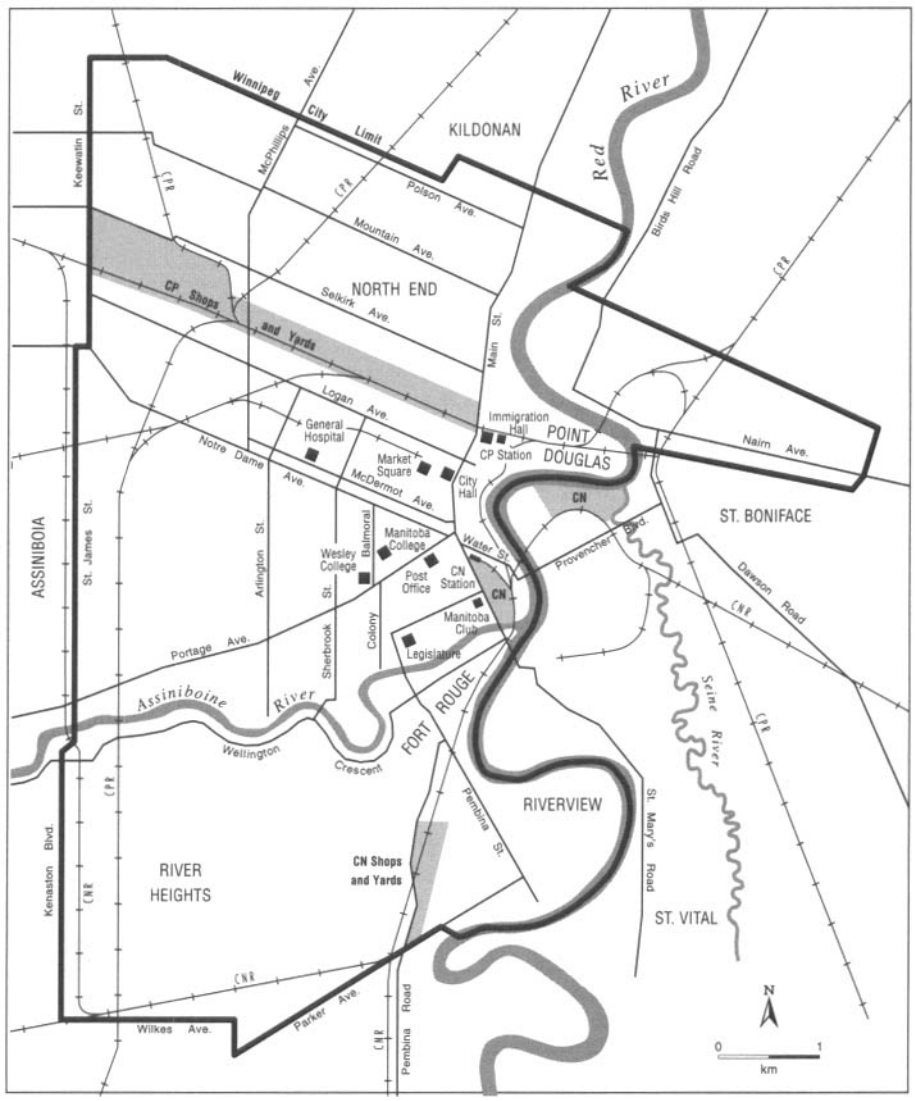

Figure 10.1 Early Development of Winnipeg (Source: Adapted from A. Artibise, Winnipeg: An Illustrated History *[Toronto: Lorimer, 1977], 50)*

The North End

The CPR and its facilities effectively separated the North End from the rest of the city. As early as 1895, low-income households began gravitating towards this area, and it was soon dominated by the working class and the "foreign" immigrants. The low incomes created a demand for very-low-income housing. To meet this demand, developers "pinched" the size of the lots — hence the vast number of 25- and 33-foot (7.6–10 m) lots.

Even as late as 1920, fewer than half the dwellings in the North End were connected to the municipal waterworks system — a clear example of the inequity of service distribution. Small, poorly built, overcrowded houses and apartments, outdoor toilets, dirty backyards, muddy, garbage-strewn streets, poor lighting, and too few schools, parks, and health care units characterized the area. Drunkenness, gambling, and brothels were typical, and the squalor resulted in higher infant mortality rates and serious outbreaks of typhoid.

Better-Quality Residential Areas

Suburban development was just beginning by the outbreak of World War I, but the pattern that was to dominate had already been established with growth to the west, south, and east. These areas developed later because until the turn of the century there was room in what was still an attractive core. Until the use of the bicycle became commonplace, followed slightly later by the streetcar, these areas were also a long commute from the place of work, the Central Core. When the West Gates, Crescent, and

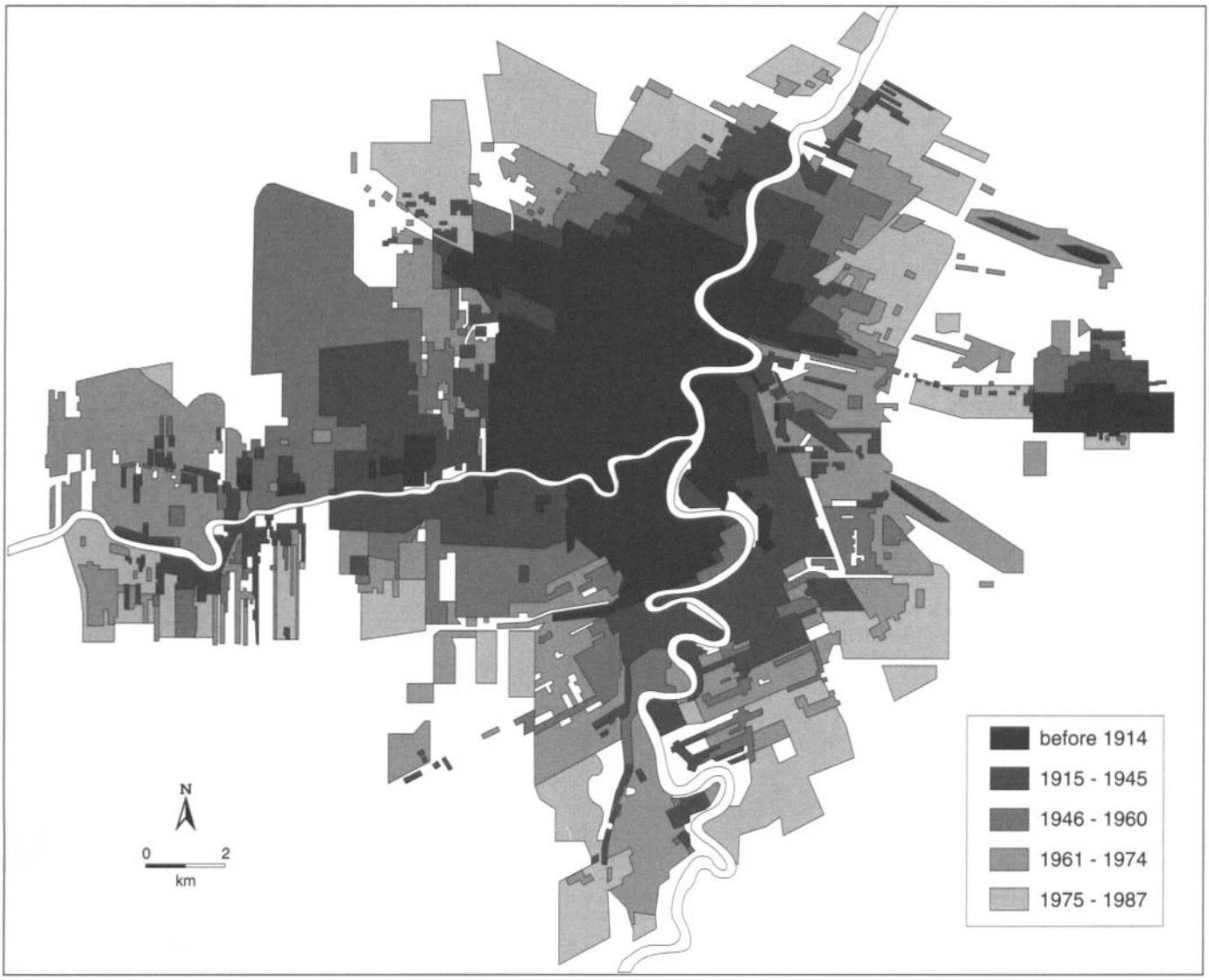

Figure 10.2 Evolution of the Built-up Area of Winnipeg, 1914–87 (Source: Institute of Urban Studies, St. James Assiniboia School Division: An Urban Futures Study *[Winnipeg: University of Winnipeg, 1988], 2)*

Wolseley areas were opened, there was a conscious effort to maintain them as reasonably exclusive residential areas. Generous lot sizes, restrictive building standards, large trees, and proximity to the rivers made these areas much more expensive. It also restricted occupancy to the more well-to-do British.

St. James, strung out along the major access route of Portage Avenue, was almost exclusively a middle-class residential area. Reduced danger of floods, lower taxes, and larger lots made it a favoured location. Before World War I, smaller working- to middle-class residential areas had also developed in St. Vital, Kildonan, and Transcona.

Residential growth produced a city divided. A middle- and working-class core was surrounded by working-class and very-low-income areas to the north, middle-class areas to the west and east, and an upper-class area to the south. Ethnically, the core contained fairly large numbers of all ethnic groups; the north was dominated by Slavs, Jews, and Scandinavians; the British lived to the south and west; and the French lived to the east.

Deterioration of the Inner City: 1914–45

During the 30-year period from the start of World War I to the end of World War II, the pattern of physical growth established in preceding decades was maintained. The city was bigger in 1945 than in 1914, but only slightly different (Figure 10.2). The location and desirability of residential areas, the segregation of classes and ethnic groups, the pattern of suburban development, and the location of industry and commerce were basically similar.

By World War I, however, problems that continue to plague the city had started to develop. People were starting to withdraw from some areas, and some residential and commercial areas were beginning to decay. The weakening economic position of the city, the Depression, and restrictions on building during World War II started the long-term deterioration of the city's inner commercial core, the surrounding residential areas, and the

North End. During the Depression, real estate values remained very low. Many houses were allowed to deteriorate, creating extensive areas of poor-quality housing.

By the end of World War II, Winnipeg had a shortage of no fewer than 10,000 housing units. Slums along both sides of the CPR tracks from Point Douglas westward became even more dilapidated. Many businesses went bankrupt, some were torn down, and others were saved from vacancy only by an expanding needle trade. Many buildings, including opulent mansions, were demolished by their owners to escape the tax burden.

With the decline of Winnipeg's strength as the national and international link for a vast western and northern hinterland, the size of the CBD became too large for its shrinking economic and commercial strength. Physical deterioration and changing use of buildings, as well as underuse of floor space, were common. During this period, the Hudson's Bay Store moved from Main Street to its current location further west, on Portage Avenue. This, plus the construction of the Provincial Legislative Buildings on Broadway, initiated a shift of retail and commercial activity from Main Street to further west along Portage.

In the 1930s the University of Manitoba moved from Broadway to its present location in South Fort Garry. St. John's and St. Paul's Colleges followed. This stimulated development in South Fort Garry, but further weakened the downtown core. During the Depression the only new initiatives of any significance were an auditorium, infrastructure upgrading under federal make-work programs, and a municipal airport. The auditorium was the only initiative to add any vitality to the downtown area.

Figure 10.3 Some Winnipeg Place Names

The Growth of the Suburbs: 1946–91

After World War II, builders and developers began reshaping the city, but the real building boom that altered almost the entire urban landscape did not occur until the 1960s and early 1970s (Figure 10.2). Because of the incredible shortage that had developed during the Depression and war years, housing was the focus of construction activity. The economy's relative prosperity, stronger population growth, and a growing demand for government and community services helped fuel the building boom.

People also moved in significant numbers to suburbs in the surrounding municipalities, which grew at the expense of the city of Winnipeg. Families sought residential land no longer available at reasonable prices in the city, and both families and industry tried to avoid the higher tax structure of the city. Housing consumers were attracted to more modern designs on spacious lots in the suburbs. Businesses and industries were drawn away to more suitable modern facilities in outlying industrial parks, and several new shopping centres (Polo Park, St.Vital, and Northgate) quickly followed the population to suburban areas.

New residential zones in the northwest and northeast were developed, but most suburban activity was an extension of previous patterns. Polo Park, the city's first major shopping centre, opened in 1959 (Figure 10.3). During the 1950s the stadium, the arena, Rainbow Stage, 16 new suburban schools, and additions to several hospitals were built. During the 1960s and early 1970s new industrial parks sprang up in Fort Garry, near the airport, in St. Boniface, and along Inkster Boulevard.

All of this weakened the inner-city residential and commercial structure, but other factors also reduced the area's potential for investment. The functional obsolescence of the buildings in the warehouse district relative to new handling and distribution trends and procedures weakened the functionality of the CBD. Corporate

restructuring saw head offices move from Winnipeg to other Canadian growth centres, such as Toronto and Vancouver. The decline in passenger rail traffic and the role of the railway in freight transportation also weakened the CBD. Warehouses were now more appropriately located in the outskirts, near major arterials leading out of the city, as trucks replaced trains.

The construction of the Perimeter Highway also strengthened the intersuburban traffic and the position of suburban industry, as it provided easy access to other areas of the city and the rest of the province. Events in the inner city also made the suburbs more attractive. The building of the Disraeli Freeway through Point Douglas in the 1950s to accommodate the flow of suburban automobile commuters to and from the CBD divided the community and separated it from the downtown area, hastening residential and commercial deterioration in the area. Main Street developed an increasingly unsavoury reputation for violence, substance abuse, and prostitution as the commercial strength and physical quality of the area declined, further hastening the flight of residents and businesses from the inner city.

The continued deterioration of the housing stock became a major concern. In 1958 Winnipeg city council established the Urban Renewal and Rehabilitation Board, which for the next two years undertook several studies of the central part of the city.[7] The studies identified the need for redevelopment, rehabilitation, and conservation, and in 1963 this process began with the construction of approximately 500 units of public housing in the Burrows-Keewatin and Jarvis Avenue areas. There was a growing recognition that the public sector needed to involve itself in the building and development process, and that planning was an essential ingredient of modern urban growth.

Although they continued to weaken, the older areas were also altered during this period. The inner city was subjected to considerable urban renewal with the construction of a number of major public buildings and institutions, including the Convention Centre, a new City Hall, the Planetarium, the Concert Hall, and the Art Gallery. Older dwellings made way for new higher-density residential development, particularly along the banks of the Assiniboine. However, private- and public-sector development in this period also strengthened the dichotomy between rich and poor in the older residential areas. The older deteriorating housing stock and public housing became home to the very-low-income households, while higher-density redevelopment focused on a much-higher-income group.

From the late 1970s on, Winnipeg was characterized by more modest growth. Suburban expansion continued, but at a much more modest pace, and growth was very much an extension of original patterns to the south and west and the southeast. Expensive suburbs in the southwest for move-up buyers in Lindenwoods, with more modest development in Whyte Ridge, South Fort Garry, and Island Lakes in South St. Vital, were the focus of most activity.

Perhaps the most significant aspect of development after the 1970s has been the effort to revitalize the inner city and reverse the continued weakening of the original CBD and surrounding residential areas. Numerous site-specific projects (such as the new Law Court and Remand Centre on Main), improvements to public infrastructure (such as Stephen Juba Park and the Walkway System), redevelopment of areas for mixed use (such as the Portage and Main Concourse), and The Forks (Case Study 10.1 on page 150) and Core Area Initiative renewal and revitalization initiatives are all part of these efforts. Although their importance and value should not be underestimated, the scars of physical deterioration, functional obsolescence, and human suffering are still very visible in Winnipeg's commercial core and the surrounding residential areas. The inner city certainly remains Winnipeg's Achilles' heel.

The Core Area Initiative (CAI)

Winnipeg's core area, comprising the downtown commercial district and the older residential areas, covers approximately 26 km^2 (Figures 10.4 and 10.5). It contains about 20 percent of the city's population and 25 percent of its dwelling units. The ravages of rapid suburban growth and the aging of buildings, houses, and infrastructure have resulted in economic and physical deterioration. Some 30 percent of the houses are substandard, and much of the turn-of-the-century commercial space sits vacant, unsuitable for modern warehousing and commercial techniques. While employment for the city of Winnipeg as a whole increased by 30 percent during 1971–81, employment in the core area was static.

The area has progressively lost population since 1941, with accompanying changes in the demographic mix. It has become home to an increasing proportion of low-income, disadvantaged groups, including single parents, the elderly, Aboriginal Canadians, and ethnic immigrants. These groups concentrate in the core, where there is access to social services and relatively low cost, although often substandard, housing. Poverty (as defined by the Statistics Canada poverty line) in the core is 2.5 times greater than in the rest of the city. Many residents lack the skills and education required to compete for employment, many face discrimination in housing and employment, and many are in transition, facing values and business conditions different from those in their communities of origin.

These disparities and deteriorating physical and economic conditions prompted the three levels of government to implement a common development strategy to revitalize the area in 1981.

The Core Area Initiative took a comprehensive approach to revitalization. The business community was the target of programs to assist with land assembly, site preparation, upgrading of existing buildings, management development, promotion, and marketing approaches. Money was made available for improvements to storefronts, streetscaping, and conversion of older buildings to other uses. At the community level, improvements to the physical infrastructure and service base were

aided by financing for community centres, recreational facilities, parks, seniors' centres, day-care facilities, and community-use school additions. Programs to help low-income homeowners repair their homes, to facilitate access to ownership, and to provide new or renovated rental housing helped improve the quality, availability, and affordability of housing.

There was a strong emphasis on improving residents' potential in the labour force, with funding for skills upgrading and on-the-job training. The social fabric of the community was strengthened by funding nonprofit and community-based agencies providing parent-support projects, cross-cultural events, enhancement of Aboriginal culture, and innovative educational programs such as the learn-to-read program called "Beat the Street," geared to the special needs of inner-city residents.

On balance, the CAI was perceived to have made a positive contribution to revitalization. However, the conditions that gave rise to the CAI persist, not because all the revitalization efforts failed or were misguided, but because the efforts have only scratched the surface of longstanding, complex, and systemic problems, such as poverty, unemployment, lack of education, discrimination, and so on. These problems require much broader responses than a localized, short-term revitalization initiative alone can offer. Without the CAI, however, the physical condition, social fabric, vibrancy, and vitality of Winnipeg's inner city might be far worse than they are today.

Figure 10.4 The Core Area of Winnipeg (Source: Winnipeg Core Area Initiative, Final Status Report of Programs and Projects *[Winnipeg: Winnipeg Core Area Initiative, 1992], 6)*

The Current Land-Use Pattern

Current land use illustrates a not-unpredictable pattern. The city continues to expand at the edge in four quadrants — northwest, northeast, southwest, and southeast. The most substantial residential growth is occurring in the southwest and southeast corridors, in Southwest Fort Garry, Whyte Ridge, and Island Lakes (Figure 10.3). Although infilling and redevelopment have resulted in new and higher-density residential areas in the older parts of the city, these have not been significant enough to prevent further suburban expansion.

Commercial development exhibits the characteristic North American pattern of dispersal from the core to the suburban areas, with the significant development of large shopping centres. Small office developments have also sprung up in and around these centres, but most office space is still concentrated in the core. Strip malls have proliferated along major arterials such as Portage Avenue, Pembina Highway, and Henderson Highway. Although some industry is still located along the railways, much of it has dispersed to the industrial parks in St. Boniface, Fort Garry, near the airport, and along Inkster Boulevard in the northwest.

Expansion at the edge and deterioration — and in some cases abandonment — in the older areas describes reasonably well the changing land-use situation, despite great efforts to reverse this trend over the past two to three decades.

WINNIPEG'S POPULATION

Boom Followed by Declining Strength

Winnipeg's growth occurred in stages. There was very rapid growth during 1871–81, when the population increased from a small village of 241 people to a large, thriving community of approximately 8,000.

Figure 10.5 Downtown Winnipeg. The pattern of development in Winnipeg has been influenced by both natural and human-made features. The junction (Forks) of the Red and the Assiniboine Rivers was the early focus of development. Later railways stimulated new commercial and industrial patterns and separated ethnic and socio-economic groups (such as the North End). (Photograph: NAPL A27254-97)

Table 10.1 Population Change: Metropolitan Winnipeg Compared with Manitoba

Year	Population				
	Manitoba	Metro	Metro as a % of Manitoba	% change Metro	Metro Average Annual % Growth
1871	25,228	241	1.0		
1881	62,260	7,985	12.8	3213.0	321.3
1891	152,506	25,639	16.8	221.0	22.1
1901	255,211	47,969	18.8	87.1	8.7
1911	461,394	155,563	33.7	224.3	22.4
1921	610,118	227,200	37.2	46.1	4.6
1931	700,139	288,064	41.1	26.8	2.7
1941	729,744	302,024	41.4	4.8	0.5
1951	776,541	358,813	46.2	18.8	1.9
1961	921,686	475,989	51.6	32.7	3.3
1971	988,245	540,255	54.7	13.5	1.3
1981	1,026,245	584,842	57.0	8.3	0.8
1991	1,091,942	652,354	59.7	11.5	1.1

Source: Statistics Canada, various years.

Rapid growth continued over the next decade with the arrival of the railway in 1881 and the opening of the rich agricultural lands of the province and areas west of Manitoba. More modest but substantial growth occurred in the decade to 1901, and then a new influx of settlers helped to more than triple the population of the city before 1911 (Table 10.1).

Growth in subsequent decades was much more modest. Settlement slowed as the agricultural land filled up, and a deteriorating international economy and international conflict negatively affected the flow of both trade goods and people.[8] As early as the 1920s, other centres in the West began to compete with Winnipeg. By 1951 both Calgary and Edmonton were almost half the size of Winnipeg, while Regina and Saskatoon were less than a quarter the size. Today, however, Calgary and Edmonton are both larger, and Regina and Saskatoon have been growing faster (Table 10.2).

Only a very modest growth spurt in 1951–61, prompted by the baby boom and more buoyant economic growth after World War II (Chapter 8) interrupted what has been a very modest but steady growth rate since the early part of the century. Over the last 20 years the annual growth rate has averaged about 1 percent, but the city's age structure (Case Study 8.1 on page 119), its ethnic and racial composition, and the distribution of population within the metropolitan area have changed substantially.

The Origin of Recent Growth

During 1971–91, natural increase (the surplus of births over deaths) added an average of 4,155 people per year to the city's population.[9] The city also consistently gained people from the rest of the province at a rate of 700 per year. Also significant was migration from outside Canada, at an average rate of 2,700 per year during the period.[10] These gains, however, have been largely lost to other provinces through interprovincial migration, leaving an average annual net change over the period of approximately 3,800 people — an average annual growth rate of 0.67 percent.[11] Young people seeking better

employment opportunities account for many of those leaving the city.

The Changing Distribution of the Metropolitan Population

The reshuffling of population strength and the changing emphasis of population growth on the Prairies has been repeated on a smaller scale in the Winnipeg Metropolitan Area. Since 1971 the fringe communities in the metropolitan area outside the city limits and beyond the jurisdiction of the city have been growing more rapidly than the city itself (Table 10.3). The city's population grew by a modest 15.2 percent over the 20-year period from 1971 to 1991, but the rural municipalities in the fringe area grew by 69.4 percent, essentially as a result of local population shifts. Winnipeg residents are choosing to move outside the city limits into neighbouring communities. They are commuting into the city for the purposes of employment, shopping, and entertainment, while maintaining a residence marked by lower property taxes and a more relaxed rural lifestyle.[12]

Another major population change that has occurred in Winnipeg is the significant shift from inner city to suburbs. The inner city has progressively lost population since 1941. Recent data indicate that in 1971 the inner city contained 129,525 people. By 1991 this number had fallen to 112,454, a 13 percent decline.[13] Although some of this decline can be attributed to the gradual process of aging that households in an area experience, and the decline in population size that occurs as they age, much of it can be attributed to the actual movement of people to new housing in new suburban areas.

Table 10.2 The Relative Size of Other Prairie Metropolitan Areas Compared to the Population of Winnipeg, 1951–91

Year	Winnipeg Population	Proportion of Winnipeg Population			
		Calgary	Edmonton	Regina	Saskatoon
1951	356,813	0.36	0.45	0.20	0.15
1961	475,989	0.59	0.71	0.24	0.20
1971	540,262	0.75	0.92	0.26	0.24
1981	584,842	1.01	1.12	0.28	0.26
1991	652,358	1.12	1.44	0.33	0.36

Source: Statistics Canada, various years.

Table 10.3 Urban-Rural Fringe Population, City of Winnipeg and Rural Municipalities, 1971–91

Location	1971	1991	% Change
City of Winnipeg	535,220	616,790	15.2
Rural Municipalities (Fringe)			
East St. Paul	2,616	5,820	122.5
West St. Paul	2,429	3,658	50.6
Springfield	5,939	11,102	86.9
Ritchot	2,946	5,146	74.7
St. François Xavier	645	898	39.2
Rosser	1,171	1,364	16.5
Tache	3,749	7,576	102.1
MacDonald	3,169	3,999	26.2
St. Andrews	5,865	9,461	61.3
St. Clements	5,047	7,870	55.9
Rural Population (Fringe)	33,576	56,894	69.4
Total Population	568,796	673,684	19.5

Source: Statistics Canada.

Importance of Ethnic Diversity

Winnipeg has always been an ethnically diverse city because international migration was so much a part of its past development. Migration and diversity continue, but since the early 1980s the origin of international migrants has changed significantly. Traditionally, they came from the British Isles, Germany, the Scandinavian countries, Ukraine, and other nations of central and northern Europe. Immigrants are still arriving from these areas, but a much higher percentage come from Southeast and East Asia. People are also arriving from Africa, the Caribbean, and South America.

In fact, international migration to the city is now dominated by people from the Third World. In 1981 people arriving from Third World countries made up 22 percent of the immigrant population in the city, but by 1991 this figure had risen to 43 percent.[14] Many are political or economic refugees, and all fall into the category of visible minorities. This has added to the rich ethnic and cultural diversity that characterizes Winnipeg, but it has also brought new challenges in racial integration and a host of social problems that the community has to address.

The number of Aboriginal people has increased even more rapidly than that of the other minorities. Between 1981 and 1986, the number of persons of Aboriginal origin rose by about 70 percent, from 16,000 to 27,475. By 1991 the population had risen to 47,545, a 73 percent increase.[15] Like migrants from the Third World, Aboriginals come to Winnipeg seeking jobs and better services. However, unlike migrants from other parts of the world, who achieve a much higher standard of living after 10 years, many Aboriginal households get locked into poverty.[16]

Growing Older

More modest growth rates and much lower birth rates than in the past, improving longevity, and the loss of younger people who leave the city in search of employment else-

where in Canada have led to a decided aging of the city's population (Case Study 8.1 on page 119).

THE ECONOMY

Between 1738 and 1812, fur was king and the economic fortunes of what was to become Winnipeg were tied to the two companies that controlled the trade — the Hudson's Bay Company and the North West Company. The early, but fragile, beginnings of agriculture started with the arrival of the Selkirk settlers in 1812 (Chapter 6). Over the next 40 years the economic fortunes of the settlement depended on the fragile relationship between fur and agriculture — the first struggling to survive in a changing environment, the other struggling to establish itself in a harsh natural environment and a political atmosphere that was not always supportive.

During the 1850s, trade with the United States created a stronger commercial sector in the settlement. By 1859 the HBC found that general trade in their store surpassed the value of the fur trade. When Manitoba entered Confederation in 1870, Canadian capital and traders from the east touched off a rapid commercial expansion that lasted into the next century.

With the arrival of the railway in 1881, Winnipeg began to evolve into a full-fledged metropolis. It established a complex trade and distribution hinterland stretching from northwestern Ontario to British Columbia, well into the northern parts of the Prairies, and south into the United States. It was the focus of branch lines feeding the transcontinental main line (Figure 14.2 on page 199).

The railway did bring the settlers. Agricultural settlement produced a demand for services, skills, and goods, and provided produce for export nationally and internationally. Wholesale and retail dealers such as Bannatyne and Ashdown established themselves in the city and dealt in everything from liquor to nails. Several companies diversified into grain buying as the province's agricultural settlement increased (Chapter 14). The railway made Winnipeg the administrative centre of agricultural production on the Prairies. The city reached the height of its economic power and influence in the West from 1886 to 1913. Winnipeg the fur king became Winnipeg the grain and commercial king. In 1911 the *Chicago Press* stated:

> All roads lead to Winnipeg. It is the focal point of the three transcontinental lines of Canada, and nobody, neither manufacturer, capitalist, farmer, mechanic, lawyer, doctor, merchant, priest, nor laborer, can pass from one part of Canada to another without going through Winnipeg. It is a gateway through which all commerce of the east and the west, and the north and the south must flow. No city in America at least, has such absolute and complete command over the wholesale trade of so vast an area. It is destined to become one of the greatest distributing commercial centers of the continent as well as a manufacturing community of great importance.[17]

Progress was not without its dark side. Early in its history, Winnipeg was controlled by a group of powerful citizens who measured progress strictly in material terms. The city was noted for its expensive promotion of economic enterprise and its special inducements to industrial firms considering development in Winnipeg. It was a community of private money-makers little concerned with creating a humane environment for its citizens. "The fact is that Winnipeg in her feverish desire to grow, only grow, was not in the least concerned to grow properly, to develop sanely, . . . blinded to the fact that cities cannot live by growth alone."[18]

Progress did not last forever. After 1919 Winnipeg was a city in economic decline. Like all inland centres, it suffered from the drop in ocean freight rates that followed the opening of the Panama Canal. Controlling coastal interests with their political power ensured that inland freight rates remained high, particularly for manufactured and processed goods. This reduced the incentive for secondary industry to develop in inland centres such as Winnipeg. The wheat economy ceased to expand as it had in the past. Winnipeg's businesses in the 1920s were also in the hands of old men. Many young men had been lost in the war. Businesses made little effort to improve efficiency and to innovate.[19] The general strike of 1919, a weak labour movement, and falling wage rates within the Canadian urban hierarchy all sapped the strength and drawing power of the local market.

The economy improved briefly in the 1920s with rising wheat prices and exploitation of northern resources, but Winnipeg's days of economic glory and dominance were over. Rival centres developed in the West. The automobile allowed farmers to shop in rural service centres instead of through wholesalers in Winnipeg. Businesses in these service centres began to deal directly with manufacturers, reducing the control and revenue of Winnipeg wholesalers. Mail-order shopping also allowed consumers to by-pass both retailer and wholesaler, further weakening Winnipeg's commercial strength. Like all Canadian cities, Winnipeg suffered during the Depression and drought of the 1930s, although their impact was somewhat tempered by an expanding needle trade fostered by cheap space in vacated warehouses and the low wage rates companies were able to offer during the Depression.

In the 1940s and 1950s other Prairie cities grew in size and became more like Winnipeg. The city lost its role of serving the West, and turned to serving the residents of the city and its immediate hinterland, the province, and parts of northwestern Ontario and western Saskatchewan. Winnipeg was able to stabilize its economic position, and to a large extent reached a stage of self-sustaining growth. It was increasingly able to survive "by taking in its own washing." It changed from a "Gateway City" to a "Central Place City."[20]

The changing nature of the city's labour force illustrates the changing function of the city over the period 1881–1991. The decline in agricultural employment began early in the city's history. Transportation grew rapidly until the early 1900s, trade until 1951. Manufacturing increased significantly between 1921 and 1951, but then declined (Chap-

ter 17). Since 1951 employment growth has been concentrated in public services, especially community and personal services (Table 10.4), signifying the shift from an agricultural to a transportation centre and from a trade hub to a central-place service city.

Today when Winnipeg tries to diversify its economic base, it runs into competition from the high concentration of industry in central Canada, the advantage this area has with its larger consumer market, and the high tariffs and other specific trade agreements that favour the East. After the 1920s Winnipeg was relegated to serving a regional manufacturing and service function. It became a branch office instead of a head office town, and played only a secondary role in the Canadian economy.

Table 10.4 Labour Force of Winnipeg by Industry, 1881–1991

Industry	1881	1921	1951	1971	1986	1991
Primary: agriculture, forestry, fishing, trapping, mining	23.5	1.7	1.1	0.8	1.3	0.9
Manufacturing	24.2	16.9	25.2	18.2	14.7	13.5
Construction	4.8	7.3	6.0	5.1	5.7	5.1
Transportation/Communication and Utilities	3.6	15.8	12.4	11.3	10.8	10.2
Trade	14.9	21.7	23.4	18.7	18.3	17.7
Finance, Insurance, Real Estate	2.2	6.0	4.9	5.3	6.3	6.7
Community Business/Personal Service Industries	20.6	20.6	18.2	25.7	29.0	30.2
Public Administration	1.2	4.8	6.6	8.2	8.5	8.9
Other Service Industries	5.0	5.2	2.3	6.6	5.0	6.9

Source: Statistics Canada, various years.

Table 10.5 Percentage of Manitoba's Economy Attributable to Winnipeg

Economic Sector	1989	1990	1991
Population			59.7
Labour Force			
Total			62.5
Managerial/Administrative			68.0
Manufacturing			76.0
Retail Sales		65.3	
Manufacturing Shipments ($)	69.6		
Total Personal Income	63.6		
Income Tax			
Total Income Assessed (all returns)		66.0	
Total Net Tax Payable (taxable returns)		70.0	
Revenue			
Personal Income Tax		70.0	70.0
Retail Sales Tax		68.0	
Liquor Tax		62.0	
Gasoline Tax		57.0[1]	
Tobacco Tax		57.0[1]	
Motive Fuel Tax		57.0[1]	
Corporation Capital Tax		63.0[2]	
Payroll Tax		63.0[2]	
Land Transfer Tax		90.0[3]	

Notes:
1. Based on population distribution.
2. Based on employment distribution.
3. Based on real estate transactions (provided by Canada Mortgage and Housing Corporation).

Source: Statistics Canada, various years.

Winnipeg in the Economy of Manitoba

Within the province, Winnipeg's economic importance remains unchallenged. In 1991 the city contained 59.7 percent of the province's population but 62.5 percent of the province's labour force. Approximately 68 percent of all managerial and administrative employees and 76 percent of the manufacturing employees in the province worked in the city. The city contributes 65.3 percent of total retail sales, 69.6 percent of the value of manufacturing shipments, and 63.6 percent of total personal income (Table10.5).

Historical analysis of the items documented in Table 10.5 shows that the city's proportion of these variables has for the most part been increasing over the past couple of decades.[21] As the proportion of the province's population that lives in Winnipeg rises, the strength of its contribution to the provincial economy increases. Winnipeg is truly a primate city within the province.

The strength of Winnipeg in the provincial economy and its contribution to provincial revenues have caused considerable political disagreement between the city administration and the provincial government. In 1969–70 the Metropolitan Corporation of Greater Winnipeg (MCGW) stated that despite generating 65 percent of all provincial personal taxation revenue and a far greater percentage of corporate taxation revenue from within the Winnipeg region, successive provincial governments "spend their monies on programs which are not of direct benefit to the City, and often are not even of indirect benefit."[22]

The current city administration makes the same claim.[23] The province counters by stating that it is not reasonable for the city to demand that provincial expenditures in Winnipeg should equal or exceed revenues raised in metro Winnipeg. Provincial spending is allocated on the basis of public-policy objectives,

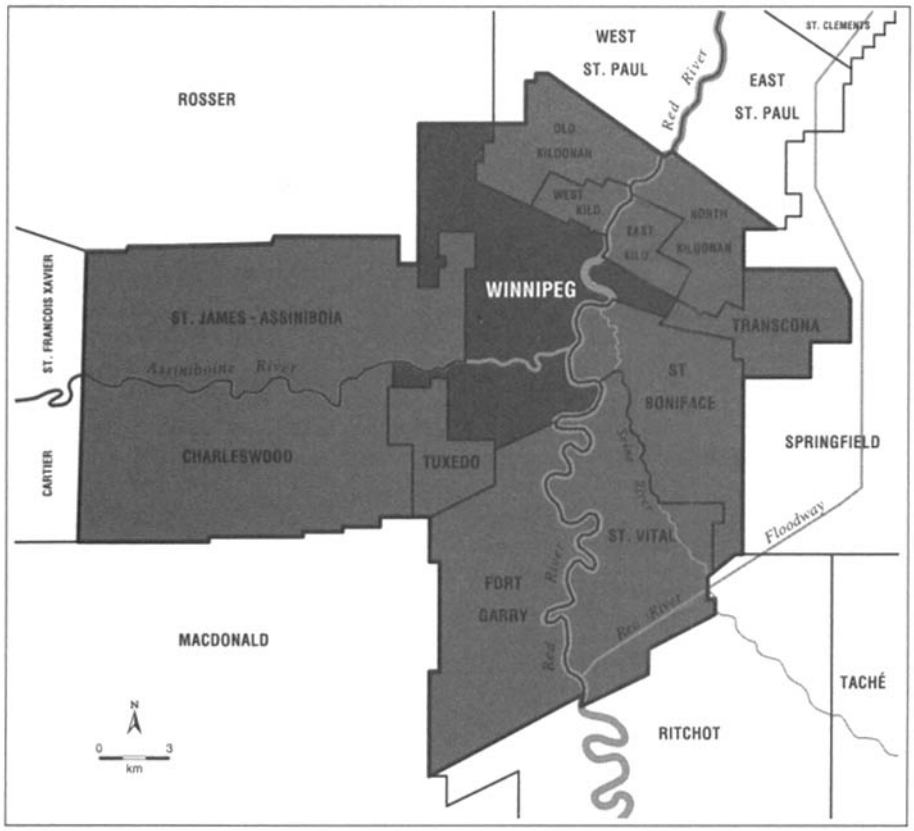

Figure 10.6 Metropolitan Winnipeg under Unicity and the Urban-rural Fringe (Source: Adapted from A. Artibise, Winnipeg: An Illustrated History *[Toronto: Lorimer, 1977], 189)*

which include redistribution to less fortunate municipalities. However, the situation does highlight the dominant position of Winnipeg in the provincial economy and the political implications of this position.

Any effort to significantly redistribute resources and allocate a greater share to Winnipeg is likely to receive little attention. Of the 57 political constituencies in the province, 31 are in Winnipeg and 26 in areas outside the city. Successive governments have been dominated by MLAs representing rural ridings or have depended on a few key seats in rural areas to remain in power (Chapter 13).

LOCAL GOVERNMENT, POLITICS, AND PLANNING

Winnipeg was established by businessmen for business purposes, and businessmen were its first leaders. Until 1920 it was governed by a mayor and 14 aldermen representing seven wards, but the real power lay with a Board of Control consisting of the mayor and four controllers elected annually.[24] The creation of this full-time, salaried executive committee elected from the entire city rather than from wards was partly responsible for allowing the Anglo-Saxon business elite to control the local government agenda. They were able to pursue a growth-ethic policy, often at the expense of orderly planning, which in turn created serious social problems that should have received more attention. This led to tremendous inequity in the distribution of public services, as demonstrated in the North End throughout most of this century.

More recently, however, certain developments have created highly politicized issues and engendered growing cleavages. Jurisdiction over planning for the entire metropolitan area, transportation issues, suburban development versus inner-city renewal, the substantial inflow of Aboriginal people, and the changing origins of international migrants have created a new political, social, and economic environment in the city, and new political forces are coming into play. Business principles and efficiency, the pillars of what was considered a good urban government in early years, are still important, but there is more interest in planning and social-equity issues. Ethnic groups have also become more involved in politics, and have begun to make their political power felt.

Planning for more rational growth and development of the city began to receive serious attention as early as the 1940s. In 1949 the provincial government created a Metropolitan Planning Commission, whose responsibility was to plan for the entire urban area. In the 1960s Winnipeg created a two-tier metropolitan form of government: 7 cities (St. James, St. Vital, St. Boniface, Winnipeg, East Kildonan, West Kildonan, and Transcona), 5 suburban municipalities (Fort Garry, North Kildonan, Old Kildonan, Charleswood, and Assiniboia), and 1 town (Tuxedo) under one regional (metropolitan) government.

The two-tier government proved ineffective. Many municipalities were unhappy over losing their power, and the result was a breakdown in implementing the long-range development plan. This prompted the political event that brought Winnipeg to the forefront of urban government reform in North America — the creation of Unicity.

The City of Winnipeg Act that created Unicity was passed by the province on 1 January 1972. Unicity was conceived as an answer to two of the most troublesome problems facing urban areas: overcoming the fragmentation of jurisdictions, with the resulting ineffectiveness of separate governments in coping with urban-regional problems and delivering cost-efficient municipal services; and fostering closer involvement of urban citizens with their government.[25] It was a regional government structure based on the principle of administrative and financial centralization but political decentralization. The system was unique in North America. It placed all the municipalities in the urban area under one regional government to eliminate conflict and stalemate in solving urban-regional

problems (Figure 10.6). At the same time it tried to achieve local political decentralization and political involvement. Some urban areas had tried one or the other, but never both.[26]

To give communities within the city some responsibility for governing their own affairs and to give the private citizen access to government, 50 councillors were elected through a ward system, with approximately 10,000 people in a ward. A community committee for every three to six wards supervised local planning and services. A Resident Advisory Group (RAG) composed of private citizens was attached to each committee, to work with and advise councillors on local matters.

The RAG was perhaps the most innovative aspect of the entire reorganization. It was an attempt to provide a legislated framework for citizen involvement.[27] The groups' effectiveness, or lack of it, has generated a great deal of discussion. Press reports have tended to emphasize problems. The groups have been called "ineffectual," "a failure," and "meaningless."[28] They have, however, sparked citizen involvement and participation, and many have used the RAGs as a stepping-stone to the office of councillor.

If there is a problem, it is that, although the RAGs were legislated into existence, legislation gave them very little power. They could advise, but the councillors on community committees could ignore them. In addition, they were given virtually no funds to use in their efforts to inform, advise, and organize the public. Several people have suggested that their ineffectiveness is in no small measure due to the attitude of some councillors and senior administrators who see very little value in citizen participation.[29]

In 1977 further reforms reduced council from 50 to 29 members, and in 1992 the number of councillors was further reduced to 15. Many feel that reforms after 1972 have weakened citizen involvement and participation and reduced the political strength of the inner city, as large wards are a poor vehicle for securing representation of neighbourhood interests, especially the interests of the less affluent.[30]

Movement to a single administration was supposed to eliminate regional political problems and competition between municipalities. To a certain extent, however, the old class polarization of the city has been replaced by an alignment that pits the inner city against the newer suburbs, or what was the old city against the former suburbs (municipalities). In addition, because of the city's growth, problems are again developing in the fringe areas.

Growth has been occurring well beyond the jurisdiction of the city of Winnipeg (Table 10.3 and Figure 10.6). Some suggest that development is being driven into other jurisdictions by the city's efforts to restrict growth within its boundaries. An Urban Limit Line (ULL) has been drawn, beyond which growth cannot occur. It has been used to ensure that growth occurs in areas contiguous with existing development, where providing infrastructure is more economical, thus preventing uneconomical sprawl on the periphery of the city. However, by restricting growth in areas that people consider attractive, it may be driving them to locations beyond the city boundaries where they can also get larger lots not always attainable in the city. Others point to the lower taxes outside the city as the drawing card. Still others claim that the city and the surrounding municipalities are not necessarily competing for the same market, as the people moving to the latter are making a lifestyle choice.[31]

The issues of divided jurisdiction and their effects on planning for the metropolitan area, tax differentials, land price differences, and competition for industry and housing are once again issues that plague the growth and development of the metropolitan area, as they did before Unicity. Planning for the Winnipeg region and the surrounding municipalities is divided in both a jurisdictional and a legislative sense. Operating under the City of Winnipeg Act, the city of Winnipeg is responsible for the city (the Unicity area); operating under the Provincial Planning Act, individual municipalities are responsible for the area beyond the city limits.

The old problem of divided jurisdiction is represented in a broader urban-regional perspective. A single economic area, occupied by consumers that all use the resources of the central city, is once again being weakened by divided and competing political jurisdictions. Compounding the problems, Headingley has been allowed to secede from the city of Winnipeg, citing high taxes for services that are not equivalent to those in the more central areas of the city. Other areas on the periphery are discussing similar options.

The provincial government, the only political jurisdiction with the power to prevent these problems, has been reluctant to take a stand and has done little to support the city as surrounding municipalities erode the strength and ability of a single political entity to plan effectively for the entire area.

CHALLENGES FOR THE FUTURE

As the turn of the century approaches, the city faces a number of challenges. The population may continue its slow growth, but ethnic and cultural diversity are certain to increase. Avoiding the racial conflict that has plagued many cities and eliminating discrimination will require far more than just simple tolerance on the part of the citizens. Communities and government agencies must develop new organizations and new initiatives to foster harmony and understanding. Many of the new migrants responsible for the ethnic and cultural diversity are locked in a cycle of poverty, and social problems will continue to demand substantial expenditures on social and community services. The increasing proportion of elderly will also require a broader range of services and new approaches to planning.

Despite major expenditures and considerable innovation under recent initiatives, the city must continue to reshape and refocus the commercial core to match its reduced economic importance. Renovating, recycling, and replacing existing buildings to accommodate changing functions and commercial

processes will be necessary. The surrounding older residential areas also need extensive investment if they are to provide a satisfactory environment for their inhabitants, many of them among the city's disadvantaged. Addressing these physical and social problems in a period of fiscal restraint is likely to be the greatest challenge of all. The purse strings of the senior levels of government draw ever tighter in an effort to reduce deficits, and slow growth and development reduce the city's potential to increase revenue from its property tax base.

If these social and physical problems are ever to be adequately addressed, city planners and elected officials must change their planning and development priorities. They can no longer be content to plan entirely to attract growth and economic development. Principles of social equity must be injected into the planning process. More resources must be directed towards meeting the needs of the inner city and its inhabitants, and to address the imbalance between inner-city and suburban facilities and programs. Addressing these issues of social equity is one of the most significant challenges to the city over the next decade.[32] With the changing political milieu and growing divisions that are becoming highly politicized, social issues are receiving, and will continue to receive, more attention.

Finally, planning for orderly growth and development in the metropolitan area will also present a challenge. Once again, as before Unicity, the urban region overlaps a number of political jurisdictions, making it difficult to plan effectively for the entire area. The ingenuity and innovativeness of Winnipeg's citizens have served the city well in the past. The city must be every bit as creative to deal with these challenges in the future.

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Case Study 10.1
The Forks
Tom Carter

The Forks should be redeveloped as a "Meeting Place" — a special and distinct all-season gathering and recreation place at the junction of the Red and Assiniboine Rivers. The "Meeting Place" theme should be used to evoke many exciting perspectives, including — the meeting of old and new, the meeting of diverse peoples, and a place for people to meet, work and play throughout the year.[1]

With this broad mandate the Forks Renewal Corporation (FRC) was established by the federal, provincial, and municipal governments on 29 July 1987 to own and redevelop the river-front site and the surrounding Canadian National East Yard area. The entire site consists of 83 acres (33.6 ha), although 18 acres (7.3 ha) are owned by the city and may be developed for commercial purposes, and Parks Canada has developed a 9-acre (3.65 ha) National Historic Park. The park covers most of the site's prime riverbank area with major green space and hard-edged riverbank facilities — walkways, marina, quay, and interpretive units (Figures 10.1.1 and 10.1.2). The remaining 56 acres (22.7 ha) fall under the mandate of the FRC.

The agreement among the three levels of government provides for a 10-member community-based board of directors appointed equally by the three levels, and a set of by-laws governing the board's management of the corporation's affairs. The FRC is funded by the three levels of government, which to date have contributed $32.6 million to development and operation through programs such as the Core Area Initiative and Western Economic Diversification. The objective is to use this money to lever additional private and institutional funds by involving the public and private sectors in developing components that are self-sufficient and self-sustaining. It is anticipated that the FRC will achieve financial independence within 10–12 years.[2]

Has the FRC achieved its objectives?

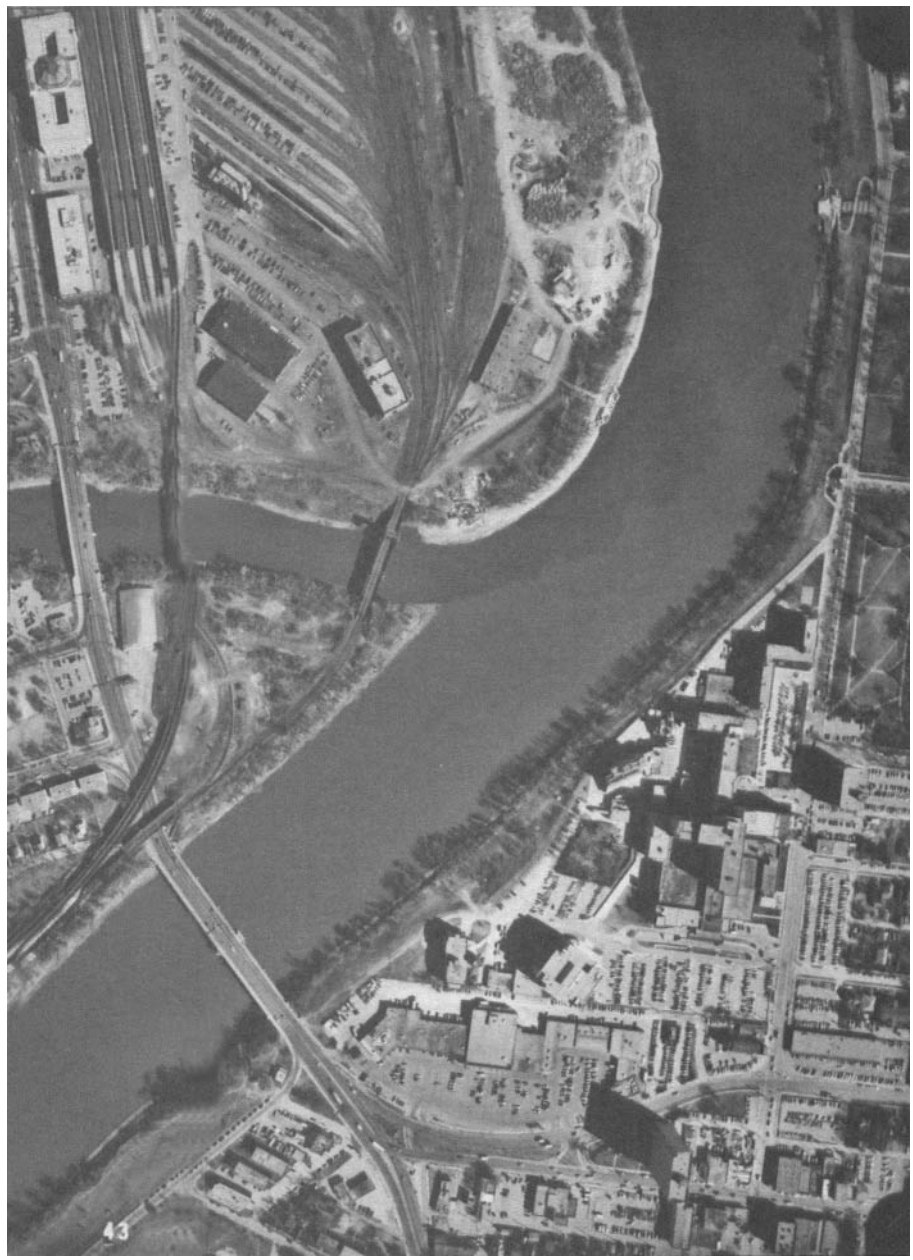

Figure 10.1.1 "The Forks" at the Junction of the Red and the Assiniboine Rivers Epitomizes the History of Winnipeg — first as an Aboriginal meeting place, then the focus of the fur trade, followed by the CN yards, and recently a commercial and recreational development project. The eastward-flowing Assiniboine carries less sediment and therefore appears darker in tone. The photograph was taken in 1988 at an early stage of The Forks development but concrete structures have already been built on the west bank of the Red just north of the junction. (Photograph: MAPL, AS 88013-43)

To date it has developed the Market — a very successful collection of 80 restaurants and specialty and craft shops. The Pavilion Building has been completed and is available for private and community use for functions, classes, and luncheons. A warming and skate-changing room in the Pavilion facilitates the use of the nearby artificial ice rink. The site also includes an archaeological preserve with 30–50 years' worth of research.

The Forks Historic Post includes docking facilities for riverboats and private pleasure craft, as well as casual use such as canoeing. The River Walk-Way is now complete all the way from the Provencher Bridge to the Provincial Legislative Buildings, and includes the Walk-Through-

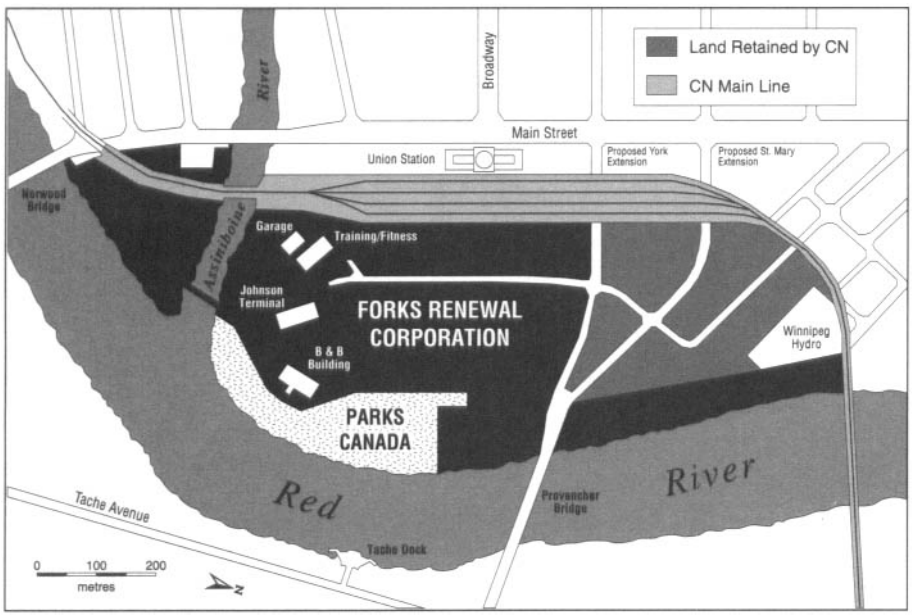

Figure 10.1.2 Projected Land Use at The Forks (Source: Forks Renewal Corporation, Phase I Concept and Financial Plans *[Winnipeg: Forks Renewal Corporation, 1987], 11)*

Time interpretive facilities, covering 10,000 years of history at The Forks.

Two terraced outdoor theatres are available — one associated with The Forks Historic Park, the other at the National Historic Site across from the Tache Docks and St. Boniface Cathedral. The first can accommodate up to 50,000 people, the second 3,000.

Historic railway cars (two boxcars, two pullmans, and a caboose) are on display to celebrate the transportation links and history of the site. The Johnson Terminal Building has been redeveloped and contains commercial office space, public-use areas, an archaeology laboratory, and the sports hall of fame. The B and B Building has become a home for the Children's Museum, and it is anticipated that South Point will be developed by the Aboriginal community. The open space and the facilities already in place have hosted hundreds of special events during the past couple of years, ranging from ethnic festivals through children's festivals, events of the Canada Summer Games to tai chi demonstrations. Winter activities have been enhanced by the addition of toboggan slides.

Public consultation has confirmed that citizens want to see continued development on the site, with an emphasis on historical, cultural, and recreational activities. Recreation was favoured by 96 percent, culture and history by 94 percent. Commercial development that enhances these activities is also supported by 80 percent of the public, and 20 percent want to see small amounts of residential development.[3]

Despite the success of The Forks, it is not without its critics. The Forks board indicates that it may not be able to achieve financial independence unless it focuses on tax-paying commercial and residential development. Critics have also taken issue with what they feel is too heavy a focus on commercial endeavours that have been lured to The Forks and supported by public funds. They feel that because of the extensive use of public funds, The Forks should be a public park or at least restricted to public use and to nonprofit or cultural facilities. These are not revenue-generating, however, and would make The Forks a drain on the taxpayer forever.

The emphasis on commercial functions has also been criticized for competing with an already weak commercial base in the downtown area, further weakening efforts to revitalize the core. Critics claim that the area should have been left as a passive green-space park until renewal of other parts of the core was complete. Despite extensive public consultation, The Forks board has also been criticized for not consulting the public and all the constituents with an interest in the site.

Despite the criticism, The Forks is popular. It is busy every day of the week. The people of Winnipeg and tourists visit it and find it attractive. The diversity of facilities and activities has certainly achieved many of the objectives in the FRC's mandate. The site is a combination of old and new, a meeting place, and a mixture of cultures; it is available for people to meet, work, and play 7 days a week, 12 months a year. As it has been many times throughout the last 10,000 years, The Forks is once again a meeting place.

NOTES

1. Forks Renewal Corporation, *Phase I Concept and Financial Plan* (Winnipeg: Forks Renewal Corporation, 1987).
2. Ibid.
3. Forks Renewal Corporation, *A View from The Forks 4* (1) (Winnipeg: Forks Renewal Corporation, September 1993).

THE NON-METROPOLITAN SETTLEMENTS OF SOUTHERN MANITOBA

11

Christoph Stadel

THE FOUNDATION OF THE MODERN SETTLEMENT SYSTEM

Although Manitoba has been occupied by people for at least 2,000 years (Chapter 5), the current settlement system is largely a heritage of political, economic, social, and technological developments that have transformed the space economy of the Canadian Plains since the late 19th century.

In the early 1870s the spatial and functional framework of the modern settlement system in the Prairies was established,[1] reflecting a transition from a "pre-urban stage" to one of "incipient service centres."[2] During the last decades of the 19th century, the grasslands of the Canadian Plains became an agricultural frontier, and the landscape was transformed by the introduction of commercially oriented agriculture.[3] After the Dominion Lands Survey system was introduced to Manitoba in the early 1870s (Case Study 7.1 on page 102), immigrants flocked to the newly established province in search of better opportunities, with the survey system forming the basis for a generally dispersed form of agricultural settlement. Exceptions to this pattern were the linearly arranged parishes of the early-19th-century Red River Settlement, based on the long-lot survey system (Chapter 6), and the nucleated *Strassendorfer* of the Mennonite West and East Reserves (Case Study 7.3 on page 105).

RAILWAY SETTLEMENTS TAKE OFF

The building and expansion of the railway system after the 1880s greatly stimulated a further influx of settlers. This resulted in the founding of numerous towns and villages along the railway lines, giving the settlement system of the Prairies its characteristic linear spatial arrangement. This stage in the evolution of Prairie communities was characterized by "a constant succession of small, quickly built villages strung along railroads."[4] The newly founded communities, some of them experiencing short-lived initial booms, acted as railway stopover places, as collection points for the expanding wheat export economy, and as service centres for the surrounding areas. By the end of the 19th century, most parts of the agricultural realm of Manitoba were settled, and the basic network of service centres was established.

The close connection of the settlements to the railways was reflected in the layout of the towns and villages and in the spatial arrangement of their land use. Most communities were established adjacent to the railway line, with a rectangular grid of streets and settlement blocks. The grid pattern either followed the sectional survey system, especially when the community was planned before the railway arrived, or it used the railway as a basic reference line. In some cases there was a combination of the two, such as at Dauphin (Figure 11.2.2 on page 165).

In the "railroad towns," commercial land use was concentrated close to the railway, with the elevators and other railway-related storage and service facilities being located directly along the railway line, often

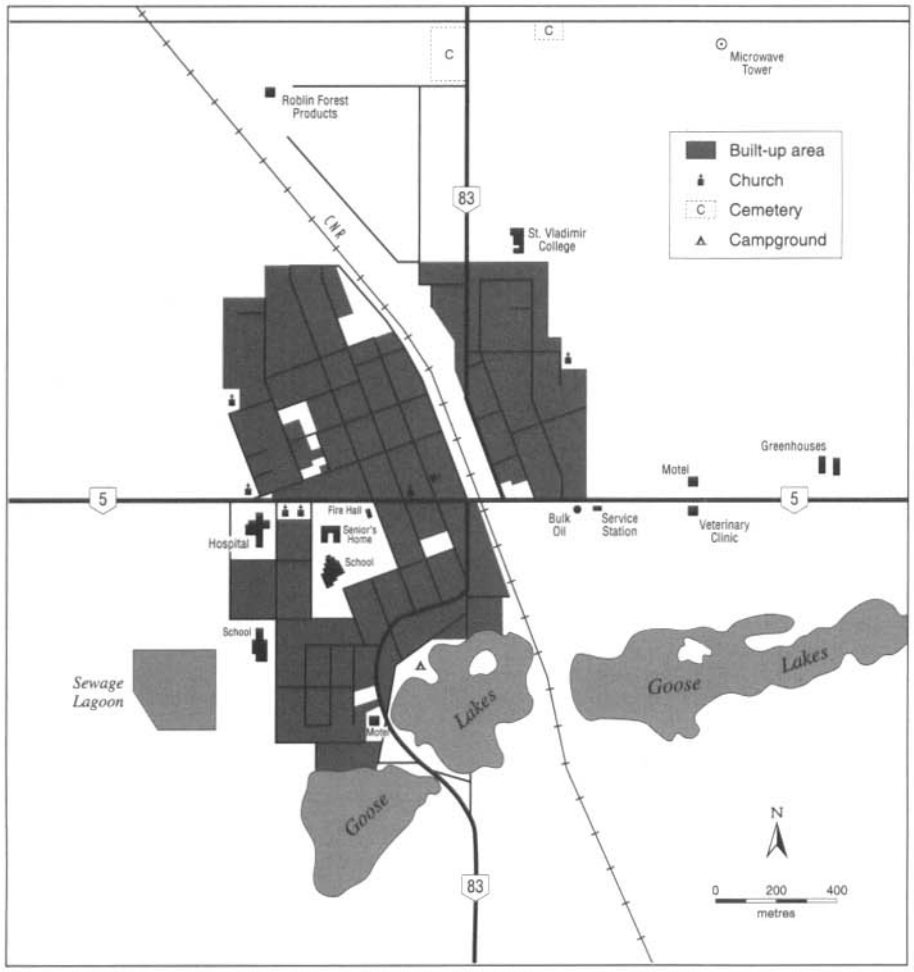

Figure 11.1 The Layout of the Town of Roblin, 1991 (Source: Modified from an original by W. Gruber)

Figure 11.2 Downtown Brandon, Taken from the Northwest. The CPR rail tracks in the foreground, which run from east to west, were the focus of early development in the city. Later, settlement spread south along Tenth Street to produce a blunt T, characteristic of many Manitoba railway towns. (Photograph: D. Aberson)

on "Railway Street" (Case Study 11.1 on page 161). "Main Street," with its concentration of retailing, usually extended from the station at right angles to the railway line (producing the so-called "T-towns"), although sometimes it ran parallel to the railway line (Figures 11.1 and 11.2). Much later, as railway lines became less important or closed, functional demise of the streets and blocks in the vicinity of the railway line often occurred, resulting in the disappearance of buildings and in blight conditions.

Besides the modern economic landscape of the Prairies — spatially and functionally organized by the farmstead, the service centre, and the railway — a cultural landscape of distinct ethnic communities also evolved (Figure 11.3).

THE SETTLEMENT SYSTEM DURING THE FIRST HALF OF THE 20TH CENTURY

In many ways, the period between the turn of the century and the outbreak of World War I can be considered a continuation of previous trends, but this stage brought "dramatic growth and prosperity"[5] to the Prairies. Immigrants continued to pour into the region, the railway network was further expanded, and changes to the political map of the Prairies took place.

The consolidation of the settlement system was manifested by four trends: (1) a filling-in process in the settled areas, accompanied by the foundation of new centres; (2) substantial growth of many existing communities, especially the urban centres; (3) spectacular growth of the major cities, particularly Winnipeg, which in 1911 became the third-largest Canadian city; and (4) rapid increase in urbanization rates.[6]

World War I heralded important social and economic changes on the Prairies that significantly affected the settlement system. Prosperity, growth, and optimism were replaced by crises, stagnation, and resignation: "The Prairies switched from being the fastest to the slowest growing region in the country in terms of urban concentration."[7] The adverse conditions for Prairie

agriculture affected the settlements that depended on the health of the wheat economy.

The period after World War I also witnessed important changes in the transportation system. In the 1920s, the railway network expanded to its maximum (Figure 14.2 on page 199), motorization boomed, and the road system was extended and improved. These developments initiated fundamental changes in the spatial and functional relationships between the countryside and the service centre. They also introduced new economic rationales and enhanced mobility, which made the dense network of towns and villages increasingly redundant and threatened the viability and even survival of the smaller villages.

This process was hastened by the mechanization of farms, which resulted in an increase in farm size, a reduction in the number of farms and in the farming population, and a decrease in the number of people serviced by the smaller centres, often below viable thresholds. Also, with the enhanced mobility of the rural population and the continued growth and attraction of larger towns and cities, the "nearest neighbour" small centres were frequently by-passed.

Thus the interwar period saw the demise of many small Prairie centres. The combined effect of the economic crisis and the economic and social changes meant that "by the mid-1930s, prairie urban centres were concentrating, for the first time in their history, not on growth, but on survival."[8]

Figure 11.3 An Ethnic Area in North Brandon. In the right foreground is St. Mary's Ukrainian Catholic Church, with the Ukrainian Reading Association to its left; in the middle is the Ukrainian Orthodox Church of Holy Ghost with the Polish Sokol Association's club and hall to the south. (Photograph: J. Welsted)

EVOLUTION OF THE SETTLEMENT SYSTEM AFTER WORLD WAR II

Many economic and social trends of the interwar period continued after World War II until the 1980s, although the agricultural economy, at least initially, entered a more prosperous phase. The move towards larger and fewer farms continued unabated, and the farming and rural populations further declined at the expense of urban people and those engaged in non-primary activities. In addition, the shrinking rural population became more "urbanized" in its mentality and way of life, its mobility increased, and its consumer tastes and shopping preferences became more and more oriented towards the larger and often more distant centres. The decrease in the "effective distance" between farmsteads and the small towns, and more dramatically between the farms and the larger towns and cities, meant that small communities were increasingly unable to compete with larger places in terms of the variety, attractiveness, and prices of goods: "Smaller-sized centres, with their limited number of services, were increasingly by-passed as a source of local supplies and a depot for surplus farm produce."[9]

The period after World War II also witnessed important changes in the transportation system that had begun in the 1930s (growing motorization, with a corresponding decrease in the importance of railways). As a result of the growing emphasis on road transportation and trucking, many railway branch lines became economically unfeasible and were closed (Case Study 14.2 on page 217), and the formerly dense network of grain elevators was thinned out (Chapter 14). "The railway . . . abandoned the small town to its local fate, and the increasing improvement of the modern truck system [made] for by-passing it altogether."[10]

A further blow to the viability of the smaller centres was the consolidation of the educational infrastructure, resulting in the closure of schools in many small communities. This had detrimental psychological and sociological effects, as schools, together with churches, used to be the traditional social pillars of the communities.

For Zimmerman and Moneo, the second stage in the evolution of the Prairie settlement system lasted from about 1930 to 1970. During this "division of labour stage," "certain communities, widely spaced, began to develop into embryonic 'farm cities' subordinating the remainder of the territory, which includes the majority of small villages and the open country, into them." The relationship between the "farm cities" and the outlying areas were "primarily economic of a consumer type, buying and selling, and not concerned directly with the basic and rural production of grain, cattle, potash, oil, gas, minerals, coal, etc., from the areas."[11]

The third stage began after 1970. Zimmerman and Moneo predicted that this "may be a stabilizing period

in which the various community forms created in the past, turn inward in search of a more satisfactory culture somewhat better adapted to life on the Canadian prairies than the previous social form."[12] They assumed that during this stage the structure of settlements would be "similar to the second stage but may add a new system of organization and change its psychosocial outlook upon life, with a shift from living off the area to living with it."[13]

Since the 1960s, various government reports and programs have attempted to address the problem of rural depopulation and the demise of small centres. The *Targets for Economic Development (TED) Report* in 1969 reflected an attitude of "economic Darwinism," assuming the inevitable decline of farms and small service centres.[14] This approach was reversed in the *Guidelines for the Seventies* in 1973.[15] The latter included policies and programs for a "stay option" that attempted to stem rural emigration by revitalizing the agricultural sector, improving living conditions and opportunities for rural residents, and decentralizing provincial government services throughout rural Manitoba.

These policies were supported by extensive studies of the economic and social conditions of "Agro-Manitoba" in the Regional Analysis Program (RAP) of the 1970s.[16] This attempt to save the rural economy and to support the viability and sustainability of small Manitoba communities has continued to the present, involving various government initiatives, programs sponsored by a number of institutes and organizations, and activities by civic-action groups in the communities.

In summary, the combined effects of economic trends, social changes, and political decisions eroded the viability of many small centres. Consumer facilities and services in the form of shopping centres, recreational and entertainment opportunities, and professional services became increasingly concentrated in the larger urban centres. Thus, the former symbiotic relationship between the rural population, the agricultural economy, and the nearest service centres was substantially weakened, and the notion of the "home community" became vague and diffuse.

Many small communities succeeded in defying the odds and showed considerable resilience and community spirit by surviving. However, other villages and towns became "truncated communities,"[17] that is, they lost many of their service functions and changed into "dormitory exurbs" for commuters or into retirement communities. Their new role as retirement centres may contribute to the demographic survival of some of these towns and villages, but may also "impose new service requirements on the small towns while, simultaneously, injecting a new burden of dependency."[18]

HIERARCHY OF SETTLEMENTS AND THEIR SPATIAL DISTRIBUTION

The development and function of Prairie settlements has been closely linked to their role as central places. Superficially, the Prairies appear to be an isotropic plain, and the spatial arrangement of different hierarchical levels of central places, their respective "baskets of goods," and the shape and extent of their service areas seem to confirm many postulates of central-place models. However, a closer examination of the settlement system of southern Manitoba reveals limits to the applicability of central-place theory to agro-Manitoba.

Although the topography of southern Manitoba appears to fit the ideal of an isotropic plain, when examined in detail several deviations are apparent. The "mountains" and hills exercise a marked control on the extent and shape of the service areas of towns and villages, and the larger lakes have an additional barrier effect on the zone of influence of the settlements. Along the northern and eastern fringes of agro-Manitoba, the topography and forest cover of the Canadian Shield form a clear natural boundary between a well-developed network of central places on the Prairies and a skeletal distribution of resource towns and Native communities with a limited role as regional service centres on the Shield. Furthermore, the central-place system of southern Manitoba is affected by the international border, the provincial boundaries, and a series of other lower-level administrative limits.

In analysing the hierarchical pattern of settlements and their spatial concentration in southern Manitoba, it becomes evident that Winnipeg and its wider urban region completely dominate the province's settlement system.[19] Because Winnipeg dwarfs the centrality indices of all the other communities, it is frequently excluded, or is treated as a separate entity in several studies of the settlements of Manitoba (Chapter 10). In turn, Brandon exercises an urban primacy within the southwestern part of Manitoba; in 1991 its population (38,567) exceeded that of the next-largest centre (Dauphin with 8,453) by 4.5 times. However, this pattern does not mean that the largest urban settlements of Manitoba also have the highest rates of population growth. Both Winnipeg and Brandon experienced only modest rates of increase over the last 20 years (Winnipeg, +15.2 percent; Brandon, +17.9 percent between 1971 and 1991).

In the *Regional Analysis Program — Southern Manitoba,*[20] a hierarchy of settlements was proposed. In this system, which excluded Winnipeg, six levels of service centre were identified: the city of Brandon, 5 "regional centres," 17 "market centres," 54 "local centres," 82 "convenience centres," and 186 "stop-off centres." In its "functional index" and the extent of its service area, Brandon outranks the other lower-level centres by a significant margin: "Brandon appears to be the only place with truly 'urban' services and characteristics, while the remaining larger places resemble large farm or rural settlements in comparison."[21]

Using a different system, Sarbit and Greer-Wootten also distinguished six hierarchical levels, with Winnipeg being the only level 1 centre and Brandon the only level 2 centre. Level 3 is occupied by Portage la Prairie and Dauphin, while 10 towns

— Selkirk, Swan River, Steinbach, Virden, Morden, Killarney, Carman, Gimli, Neepawa, and Beausejour, listed in order of their functional index scores — occupy level 4. Level 5 includes 26 places, and level 6 includes 292 communities.

Although the overall hierarchical pattern has been maintained, based on recent population development and on the relative economic and social vitality of the communities, the hierarchical ranking of a number of places has changed during the last 20 years. The major towns within the Mennonite area (Steinbach, Winkler, Morden, and Altona), which have experienced substantial population gains since the 1970s (Table 11.1), have probably increased the strength of their centrality function. However, because of their close proximity to each other — Winkler and Morden in particular — they may not have enlarged their service areas.

In contrast, central places in the regions of lesser growth, stagnation, or even decline may have slipped in the hierarchy of central places. For instance, Swan River may now rank below Steinbach, Winkler, and Morden. In the case of the other region of population gain in southern Manitoba, the "urban shadow" region of Winnipeg, the proximity to the metropolitan centre may reduce the centrality function of these settlements, which to some extent assume the role of "dormitory exurbs" for the Winnipeg urban region.

In the spatial distribution of service centres in southern Manitoba, Winnipeg (a level 1 centre) and Brandon (a level 2 centre) are the "urban anchors" and the focal points of their respective trade areas in the eastern and western parts of the province. The influence of both cities also extends into their respective northern sectors of the Canadian Shield for higher-order functions. For the highest-order functions, Winnipeg's service area includes the entire province and extends into neighbouring northwestern Ontario and the states of Minnesota and North Dakota.

Brandon's primary service area is shaped by natural features and political boundaries (Figure 11.4). To the north, Riding Mountain is a barrier, and even for the higher-order functions Brandon's centrality is negatively affected by "the mountain." To the south, the international boundary sets a sharp limit to Brandon's service area. For retailing functions, the trade area is further eroded by the pull of the city of Minot in North Dakota. In contrast, Brandon's influence extends beyond the Saskatchewan boundary, although here too the provincial boundary, especially for administrative functions, is a controlling factor.

At the next lower level (level 3), Portage la Prairie, 70 km from Winnipeg, is strongly influenced by its proximity to that city. The extent of Portage la Prairie's service area is not only compressed to the east by the pull of Winnipeg but is also restricted to the north by the barrier of Lake Manitoba. To the west, the sparsely settled hilly Spruce Woods act as a buffer and transition zone between the service areas of Portage la Prairie and Brandon.

Dauphin (another level 3 centre) is the major service centre for a relatively large low-density area in the northwestern part of agro-Manitoba (Case Study 11.2 on page 164). It also represents the cultural focus for the major Ukrainian realm of the province. Dauphin's service area is affected and shaped by natural features and by the Manitoba-Saskatchewan boundary. To the south, Riding Mountain "shields" Dauphin from Brandon's influence; on the other hand, it also greatly restricts Dauphin's service area. To the east, Dauphin's influence extends into the sparsely populated Westlake region, to the shores of northern Lake Manitoba and Lake Winnipegosis. To the northwest, its service area is shaped by Duck

Table 11.1 Population Development of Service Centres in Southern Manitoba with Population Over 1,000 in 1991 (Excluding Winnipeg)

Service Centre	1961	1971	1981	1991	% Change 1961–91
Brandon	28,166	32,713	36,320	38,567	+36.9
Portage la Prairie	12,388	12,950	13,086	13,186	+6.4
Selkirk	8,576	9,331	10,037	9,815	+14.4
Dauphin	7,374	8,891	8,971	8,453	+14.6
Steinbach	3,739	5,265	6,676	8,213	+119.7
Winkler	2,529	3,009	5,046	6,397	+152.9
Morden	2,793	3,266	4,579	5,273	+88.8
Swan River	3,163	3,487	3,782	3,917	+23.8
Neepawa	3,197	3,215	3,425	3,258	+1.9
Altona	2,026	2,122	2,809	3,060	+51.0
Stonewall	1,420	1,583	2,217	2,997	+111.1
Virden	2,708	2,823	2,940	2,894	+6.9
Beausejour	1,770	2,255	2,465	2,633	+48.8
Carman	1,930	2,030	2,408	2,567	+33.0
Minnedosa	2,211	2,621	2,637	2,526	+14.2
Killarney	1,729	2,047	2,345	2,163	+25.1
Roblin	1,368	1,753	1,953	1,838	+34.4
Pinawa (1971–91)	-	2,187	2,011	1,806	-17.4
Souris	1,841	1,674	1,731	1,662	-9.7
Russell	1,263	1,526	1,660	1,616	+27.9
Morris	1,370	1,408	1,570	1,616	+18.0
Gimli	1,841	2,041	1,688	1,579	-14.2
Niverville (1971–91)	-	938	1,329	1,514	+61.4
Boissevain	1,303	1,506	1,660	1,484	+13.9
Carberry	1,113	1,305	1,510	1,481	+33.1
Ste. Anne (1971–91)	-	1,062	1,338	1,477	+38.5
Melita	1,038	1,132	1,156	1,134	+9.2
Rivers	1,574	1,175	1,107	1,076	-31.6
Lac du Bonnet	569	952	1,030	1,076	+89.1
Deloraine	916	961	1,136	1,045	+14.1
Arborg (1971–91)	-	879	974	1,039	+18.2
Teulon	749	828	929	1,016	+35.6
Ste. Rose du Lac	790	818	1,089	1,008	+27.6

Source: Statistics Canada, various years.

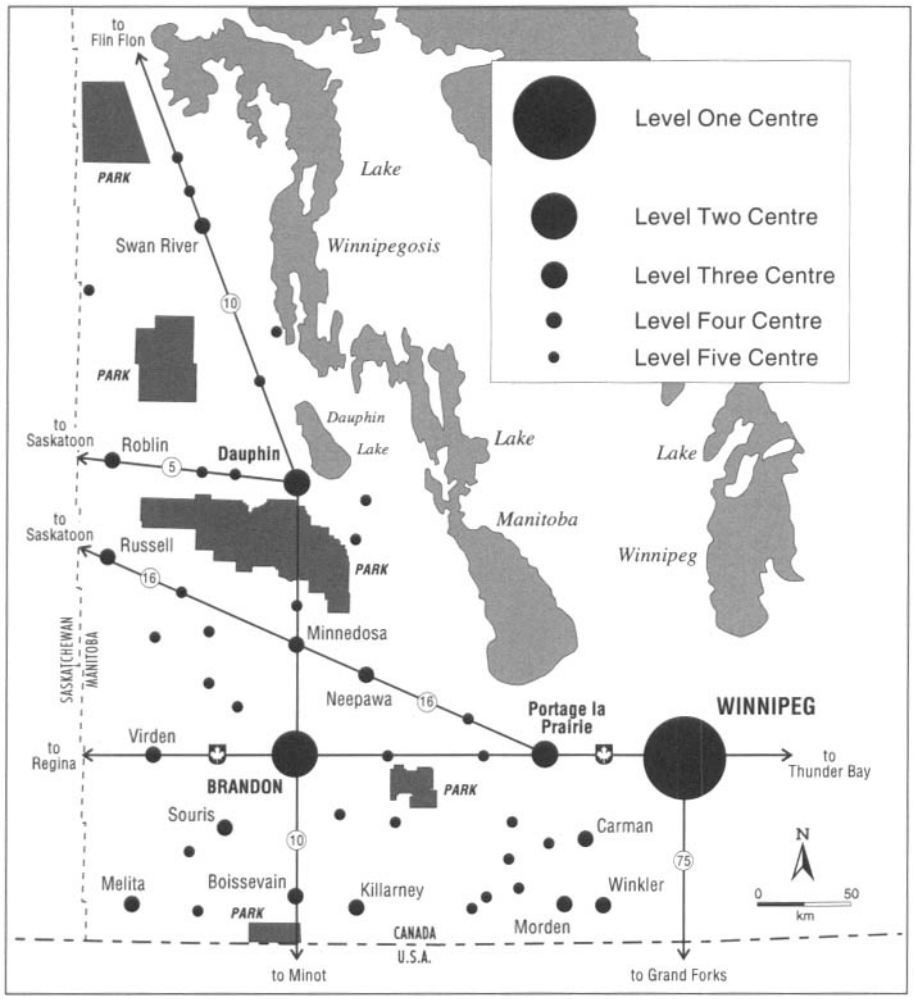

Figure 11.4 Schematic Representation of the Network of Service Centres in Southwestern Manitoba

Mountain and the Porcupine Hills, which reinforce the barrier effect of the provincial boundary. North of Swan River, Dauphin's influence weakens substantially, and the pull of The Pas (outside southern Manitoba) becomes stronger.

Six of the 10 centres at level 4 (Selkirk, Beausejour, Gimli, Carman, Morden, Steinbach) are grouped in an elliptical fashion around Winnipeg, with the Red River Valley as the major directional axis. The extent of the service areas of these places is restricted by their relative proximity to each other and to Winnipeg. Of the remaining centres at this hierarchical level, three (Neepawa, Virden, Killarney) are nested within the service area of Brandon. However, because of its rather isolated location and the absence of a nearby competing centre at the same level, Swan River controls a relatively large independent trading area.

A marked concentration of service centres is noticeable in the Red River Valley "corridor" and in the Mennonite settlement area. In other parts of the province, the spatial arrangement of service centres still reflects a linear pattern determined originally by railway lines, with relatively even spacing of settlements and with the distance between central places becoming wider in the less-intensive farming areas of the Interlake and Westlake (Figure 11.5).

VIABILITY OF THE SETTLEMENTS AND PROSPECTS FOR THE FUTURE

During the last few decades, there has been considerable discussion about the viability and the future prospects of the settlements in Manitoba and in the Prairies in general, particularly small communities threatened by severe decline or demise. Some voices, however, have expressed a conviction that the villages and towns can be sustained by appropriate initiatives and actions. Referring to a similar situation in Saskatchewan, Dale comments: "At first glance the problems of [Saskatchewan's] small towns seem altogether intractable, if not unsurmountable, but closer examination reveals that given a good deal of imagination, innovative planning and government financial and other assistance, these problems can be solved."[22]

Undoubtedly, the viability of the settlements of southern Manitoba are very much related to the health and the future prosperity of farming. Structural changes in agriculture, towards capital- and technology-intensive operations, and the declining numbers of farmers and rural people have had dire consequences for the traditional central-place role of small "neighbourhood" communities.

Changes in transportation and increased rural mobility imposed a new economic rationale and new lifestyles and social preferences on many communities. The closure of railway lines and elevators not only deprived many villages of vital economic functions but also removed from them the symbols of their original "raison d'être." This loss, together with the loss of other services — foremost being the small schools in many places — has tended to erode the pride, confidence, and community spirit of many residents. The emigration of residents, particularly younger people, further threatened the vitality of villages and towns.

Thus the absence of economic diversification produces communities with a disproportionate number of older people (Case Study 8.1 on page 119). These settlements are forced to adjust their social infrastructure to suit the older age groups, making them even less attractive to young people. Although "truncated communities" are able to fulfil a new function and to maintain certain population and service levels, their social-service investments

may become large and burdensome and their long-term viability may be questionable.

In a recent paper, Everitt et al.[23] underline the desirability and even the need to sustain rural communities because of what Hodge and Quadeer have called "the importance of being unimportant."[24] They argue that these communities can offer valid and viable alternative lifestyles for their residents and for future generations. They also suggest that abandoning the considerable investment in rural infrastructure, coupled with the ever-increasing need for additional services and infrastructure in the cities, could be an expensive option. Finally, retaining a balanced series of settlements that includes viable small communities may prove to be the correct ecological choice.

Brierly and Todd propose a framework for the sustainability of communities. It rests on the three economic pillars of "the continuing importance of the agricultural base, the adaptation of service activities, and the hosting of secondary manufacturing."[25] This framework is based on the assumption "that Prairie settlements continue, by and large, to function as service centres with a fundamental dependence between population size and servicing role."[26]

This service role traditionally depended on the size and prosperity of the farm community, but may have a good potential for expansion to include a nonfarm population both inside the town and within its service area, by attracting an urban clientele from other centres. A number of service functions may also be provided in the form of government programs. In their reliance on manufacturing, communities may seek to lessen their dependence on agriculturally based manufacturing by introducing other types of manufacturing. But these alternative forms of manufacturing face many constraints outside the larger cities, particularly in terms of availability of transportation, existence of an appropriate labour force, distance to markets, and lack of economies of scale (Chapter 17).

Some communities were able to weather the potential crisis by diversifying their economic base and

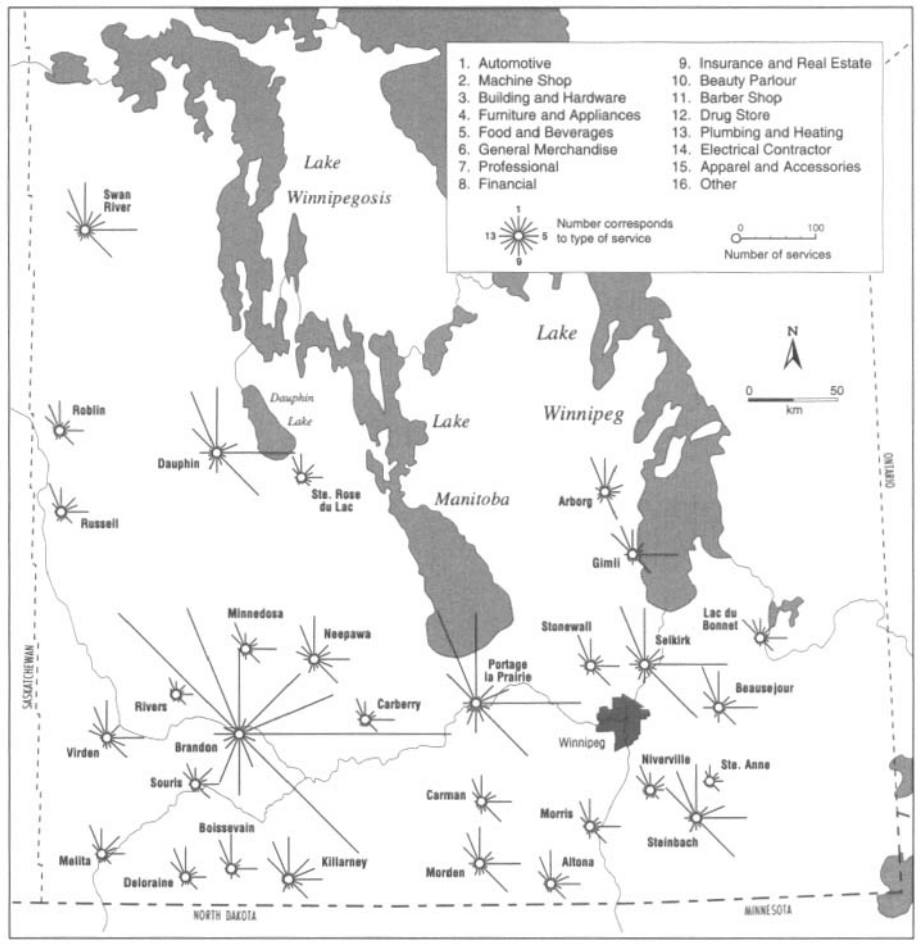

Figure 11.5 Central Places of Southern Manitoba in 1989, with Type and Number of Services (Source: Modified from an original by W. Gruber)

by recognizing and exploiting windows of opportunity. Prime examples are a number of Mennonite communities, which since the 1960s have ventured into manufacturing that is not exclusively associated with the processing of agricultural resources. These towns were able to overcome the traditional constraints on attracting manufacturing because of the availability of skilled labour, by showing a spirit of local enterprise, and by expanding their markets into the metropolitan region of Winnipeg. Other places, such as Brandon, benefited from a decentralization of government services from Winnipeg.

Noneconomic factors that influence the viability and sustainability of communities may involve their attractiveness in terms of quality-of-life indicators and their ability to meet the social needs of the residents. Brierly and Todd derived 10 such indicators reflecting residents' feelings about local systems of production, distribution, and consumption, as well as expressions of social support, socialization, social participation, and social control.[27]

The idea of stimulating community satisfaction and trust and investment in its future through local participation is also seen in "Community Choices — A Sustainable Communities Program for Manitoba." Developed by the Rural Development Branch of the government of Manitoba, this program offers rural and northern towns, villages, and municipalities a process by which people from all walks of community life can get together in a formal setting, take a realistic look at their community, draw up a plan for its future based on past and present trends, and work with the community to develop plans of action.[28] One principle guiding this program is that of *sustainability;* that is, the conviction that a secure environmental, economic, and social future for the communities relies in large measure on actions taken today.[29]

Table 11.2 Population Development of Service Centres in Southern Manitoba with Population between 500 and 1,000 in 1991

Service Centre	1961	1971	1981	1991	% Change 1961–91
Gladstone	944	933	964	928	-2.7
St. Pierre-Jolys	856	846	919	907	+6.0
Grandview	1,057	967	1,013	870	-17.7
MacGregor	642	744	795	852	+32.7
Hamiota	779	822	728	823	+5.6
Manitou	963	871	861	811	-15.8
Birtle	846	882	887	802	-5.2
Shoal Lake	774	833	835	784	-1.3
Winnipegosis	980	887	855	771	-21.3
Pilot Mound	802	763	838	747	-6.9
Gilbert Plains	849	854	812	741	-12.7
Powerview	902	667	691	736	-18.4
Emerson	932	830	762	721	-22.6
Plum Coulee	510	480	592	676	+32.5
Glenboro	797	698	741	674	-15.4
Treherne	569	628	743	661	+16.2
Winnipeg Beach	807	687	565	641	-20.6
Gretna	575	522	545	620	+7.8
Notre Dame de Lourdes (1971–91)	-	613	627	614	+0.2
St. Claude (1971–91)	-	679	592	613	-9.7
Rossburn	591	638	696	609	+1.7
Riverton	808	797	657	584	-27.7
McCreary (1971–91)	-	545	618	554	+1.7
Erickson	531	531	540	540	+2.4
Minitonas	606	610	628	544	-10.2
Elkhorn	666	569	515	505	-14.2

Source: Statistics Canada, various years.

The program also supports local initiatives, local control, and the local development of a community vision and a community plan. This concept is based on the premise that the sustainable development of communities can be achieved not by top-down blueprints but rather by bottom-up collective actions at the community level. To be successful, the local initiatives aimed at revitalizing smaller communities must be actively encouraged by cities and governments.

On the other hand, the latter cannot be expected to unilaterally support the small communities. Social and economic development and financial commitment are also local responsibilities. The residents must have a direct stake in the future of their communities in order to avoid a climate of dependence on outside forces that stifles local commitment and initiative.

CONCLUSION

The settlement system of southern Manitoba developed largely in response to the conquest of the Prairies by traders, land surveyors, settlers, railway engineers, and speculators. The location, spatial arrangement, layout, and functions of settlements responded to the needs, preferences, and lifestyles of the time in adapting to the transportation requirements and the economic and social orientation of the settlers.

Today the communities of southern Manitoba still reflect this historical tradition, but changes in transportation and mobility patterns, in rural and urban economics, in agricultural production technology, and in the demographic and social fabric of the population have initiated the transformation of existing structures and also established new forms and functions for the settlements. Over the past century, the fate of the communities was greatly linked to the state of the agricultural economy, to political and business decisions, and to the real and perceived opportunities for residents. These factors determined the migration of people and the growth and decline of communities, as well as their structures and their regional role.

While larger centres had a greater probability of success, the factors that determine the relative growth and decline of communities are rather complex, and no direct correlation can be established between the population of towns and villages and their relative growth and decline (Tables 11.1 and 11.2). In general, small, isolated communities that relied heavily on the health of the agricultural economy, on railway branch lines, and on their role as centres providing a limited range of basic economic and social services tended to decline or even disappear with changes in agriculture, rural depopulation, loss of the railway link, and the demise of their service function.

Conversely, communities within the urban area of influence of Winnipeg exhibited significant growth rates, assuming the role of commuter communities and "dormitory exurbs" for Winnipeg. The most spectacular development has been in the larger centres within the Mennonite settlement area (Figure 8.4 on page 114). These towns have diversified their economic base during the last few decades, particularly by expanding the industrial and commercial sectors. They also benefited from a favourable location and from their reputation as "safe alternative urban places" for young families.

What is the future of Manitoba's cities, towns, and villages? Nowadays the future prospects of environments and societies are commonly defined in terms of their sustainability. The sustainability of Manitoba's communities encompasses an array of dimensions: maintenance and upgrading of physical appearance and appeal, provision of services and infrastructure, "greening" of communities in terms of environmental issues, economic stability, the welfare of the population, and a community spirit based on new initiatives and self-reliance. Under conditions that have become difficult, and in a social climate of higher expectations and demands, this appears to be a major challenge.

NOTES

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2. Artibise, "The Urban West," 237–9.
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4. C.C. Zimmerman and G.W. Moneo, *The Prairie Community System* (Ottawa: Agricultural Economics Research Council of Canada, 1971), 3.
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10. E.K. Dale, "The General Problems of Western Canada's Small Rural Towns," *Regina Geographical Studies* 1(1977):87–100.
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14. Brierley and Todd, *Prairie Small Town Survival,* 20.
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17. G. Hodge and M.A. Quadeer, *Towns and Villages in Canada: The Importance of Being Unimportant* (Toronto: Butterworths, 1983).
18. Brierley and Todd, *Prairie Small Town Survival,* 25.
19. The index of primacy of Winnipeg is 17, meaning that Winnipeg's population (652,354 in 1991) is 17 times that of the second-largest city, Brandon (38,567 in 1991). This is the highest of any primate city in Canada.
20. For full details see n. 16.
21. L.A. Sarbit and B. Greer-Wootten, *Spatial Aspects of Structural Change in Central Place Systems: Southern Manitoba 1961–1971,* Geographical Monographs 4 (North York: York University, Atkinson College, 1980), 63.
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Case Study 11.1
Evolution of the Strathclair District
William G. Hillman

Early activity in the area that would eventually evolve into the Strathclair district was centred on the Little Saskatchewan River and its valley, about midway between Riding Mountain and the Assiniboine River (Figure 11.1.1). The Little Saskatchewan, a tightly meandering tributary of the Assiniboine, flows south out of Lake Audy and Clear Lake in what is now Riding Mountain National Park (RMNP), and then follows a generally southeastward course through a fertile, deeply entrenched, heavily treed valley.

Members of at least two early exploratory expeditions, led by Dickinson and Hind, recognized this valley as one of the best in the Northwest in terms of beauty and settlement potential.[1] Along with the deep, fertile alluvial soil, it contained an abundance of good water, wood, pasture, and gravel deposits, and offered a relatively easy transportation route for water cargo. The first settlement took form where the river turns southeast at Section 36, Township 17, Range 22, W1 (36-17-22). The location also gave the settlement its name — The Bend (Figure 11.1.1).

The area north of The Bend was dotted with sloughs and lakes interspersed with stands of poplar, spruce, and birch. It eventually became the Riding Mountain Timber Reserve (and then RMNP) and the Keeseekoowenin Indian Reserve No. 61. The excellent hunting, trapping, and fishing here was the raison d'être for the Hudson's Bay Company (HBC) trading post upstream, near the present site of Elphinstone.

The rolling hills and open grassland south of The Bend stood in stark contrast to the northern woodland. The unobstructed prevailing westerlies fanned prairie fires in the summer and whipped up blizzards in the winter. Indian tribes had long encouraged fire to enhance grassland for buffalo grazing; indeed, an early settler, Lord Elphinstone, found that these grazing grounds lent themselves to successful ranching enterprises.[2] Wood for fuel and buildings

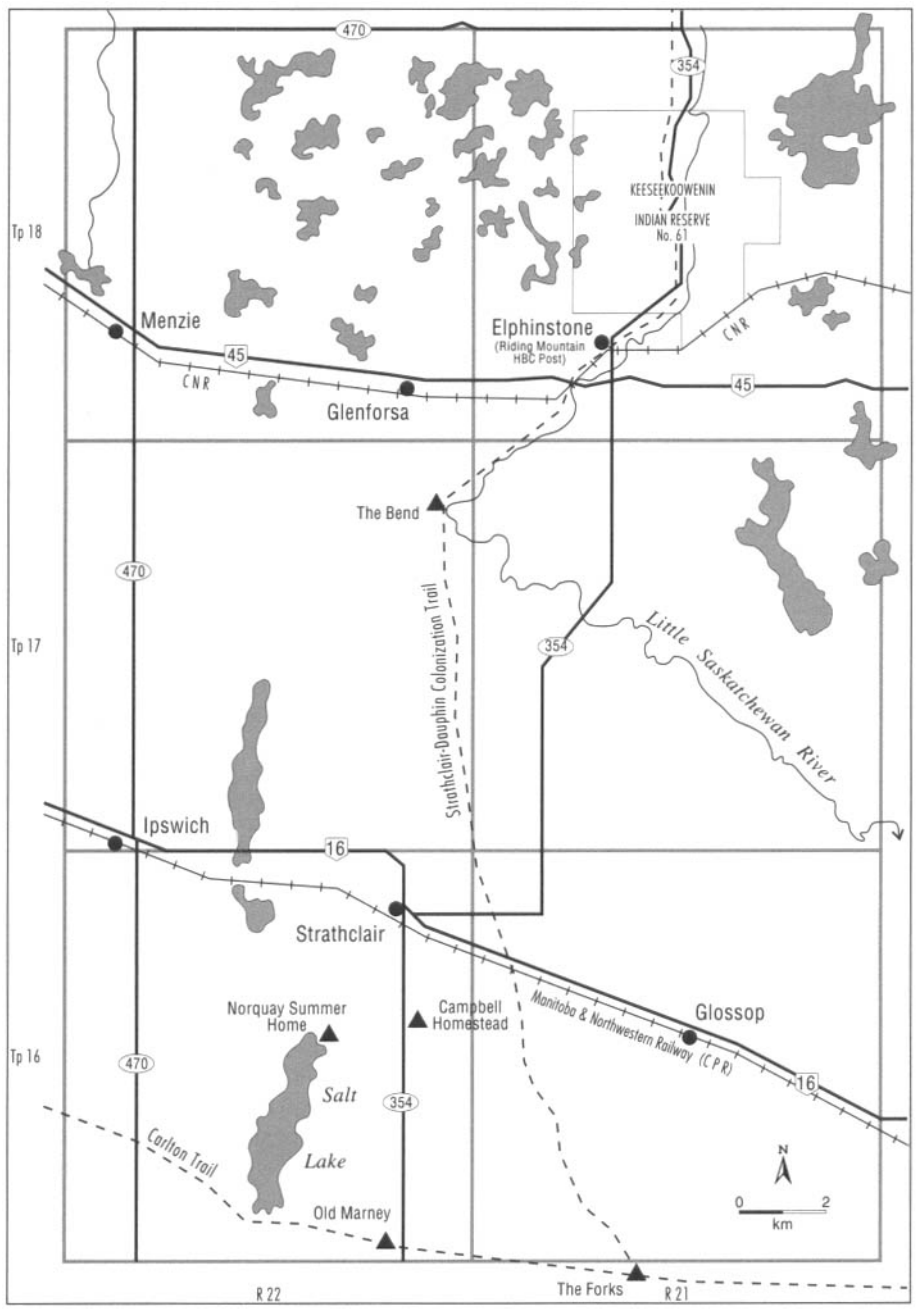

Figure 11.1.1 The Strathclair District

had to be hauled from the river valley or from further north, but as soon as the land was broken, bluffs of poplars took root and spread out from the low-lying potholes or sloughs.

Several settlements sprang up before the arrival of the railway. About 10 miles (16 km) south of The Bend and just east of the southern tip of Salt Lake was Old Marney (2-16-22), which at one time boasted a store and post office, a blacksmith shop, a brickyard, and the Do-Drop-Inn Hotel. Further east was The Forks (33-15-21), a junction at which the Carlton Trail (known also as the Hudson Bay Trail or Ellice Trail) continued on its westerly route to Fort Ellice on the upper Assiniboine, while a branch broke off northward to The Bend. From there it followed the Little Saskatchewan to Lake Audy and continued north to Gilbert Plains, Fort Dauphin, and the Swan River Valley. Many settlers travelling to the north took this Strathclair-Dauphin Colonization Trail (Figure 11.1.1), which followed an established

Indian trail from the buffalo plains along the east side of Riding Mountain on a Lake Agassiz beach ridge. They found that it offered the firmest ground, the easiest grades, and the driest sites for camping.

So the nuclei and the pattern for farm settlement were determined before the railway arrived — The Bend, Riding Mountain HBC Post, Old Marney, and The Forks were connected by the river, cart routes, and Indian trails. By the mid-1870s the area had been surveyed by Duncan Sinclair and a section-township-range grid was in place for future homesteaders and settlement. Wagonloads of adventurous Scots from the east began to arrive, having travelled by rail to Winnipeg. Scottish place names soon appeared, such as Menzie and Glenforsa. Even The Bend was renamed Strathclair, a combination of the Scottish word "strath" for valley and "clair" from the name of surveyor Sinclair.

Then came the Manitoba and North Western Railway (now a branch of the Canadian Pacific Railway), which traversed the area midway between The Bend (Old Strathclair) and Old Marney (Figure 11.1.1). Before the end of the century the original four settlements — The Bend (Old Strathclair), Old Marney, The Forks, and Riding Mountain HBC Post — had shrivelled and most activity had moved to the upstart Strathclair Station located in 35-16-22.

This event had a profound effect on the development of the area. Besides the obvious adjustments to the technological and cultural changes brought by the railway, pioneers had to erect a town from scratch on a barren prairie. Furthermore, because the railway company held rights to the land along the line, the town's business strip stretched along only the northeast side of the main street, which ran parallel to the tracks in a northwest-southeast direction, a situation characteristic of many Prairie towns (Figure 11.1.2).

Pioneers such as James Campbell, who had settled some distance from "civilization" (NW 24-16-22), now found themselves on the fringes of a booming settlement with full rail services.[3] The railway and land companies carried on extensive

Figure 11.1.2 Strathclair in 1989. The village is located in the southeast quarter of Section 35, Township 16, Range 22, W1. The CP railway line runs along the southern edge of the village, and roads have been built parallel and at right angles to it. The topography of the northern half of Section 35 is typical of the ground moraine of this area. (Photograph: MAPL MB 89004 PTH16-17)

advertising campaigns to lure new settlers, resulting in a flood of newcomers and infusion into the area of a much more diverse ethnic mix. By 1888 even the premier of Manitoba, the Honourable John Norquay, had a summer home on the northeast corner of Salt Lake — a lake that was fast becoming a popular picnic and resort spot. He planned to erect a sanatorium there, as analysis of the waters had shown them to be beneficial to sufferers of rheumatism.[4] Unfortunately, he died suddenly and these plans never materialized. Nevertheless, by the turn of the century, Strathclair had grown into a robust and thriving farm community.

The glory years of Strathclair and many other similar Prairie communities came in the mid-20th century — the '50s decade. The excitement and spirit of these towns was perhaps best epitomized by the Saturday night "event." Following the Saturday evening supper hour, families would prepare to go to town. The first cars to arrive would get the best "seats." This meant finding a diagonal parking spot along the north side of the main street (North Railway Street), in the well-lit, high-traffic area extending from the poolroom at Minnedosa Street to the modern self-serve department store at Campbell Street (Figure 11.1.3).

Between these termini, people of all ages walked a jostling gauntlet along a strip of thriving businesses. Three favourite spots were the drugstore with its soda fountain and magazine rack, the Chinese café with its booths for socializing, and a rival eatery that featured a jukebox, pinball machine, and lunch counter with stools.

Many of the men gathered in one of the two male bastions, the beer parlour and the poolroom, while a favourite routine for women was to peruse the line of parked Fords, Chevies, and Dodges, each vehicle demanding a nod, a wave, or a detour off the sidewalk to chat. When the week's discussion lagged out on the street, there seemed to be no end of open doors into shops to provide diversion: bakery, grocery,

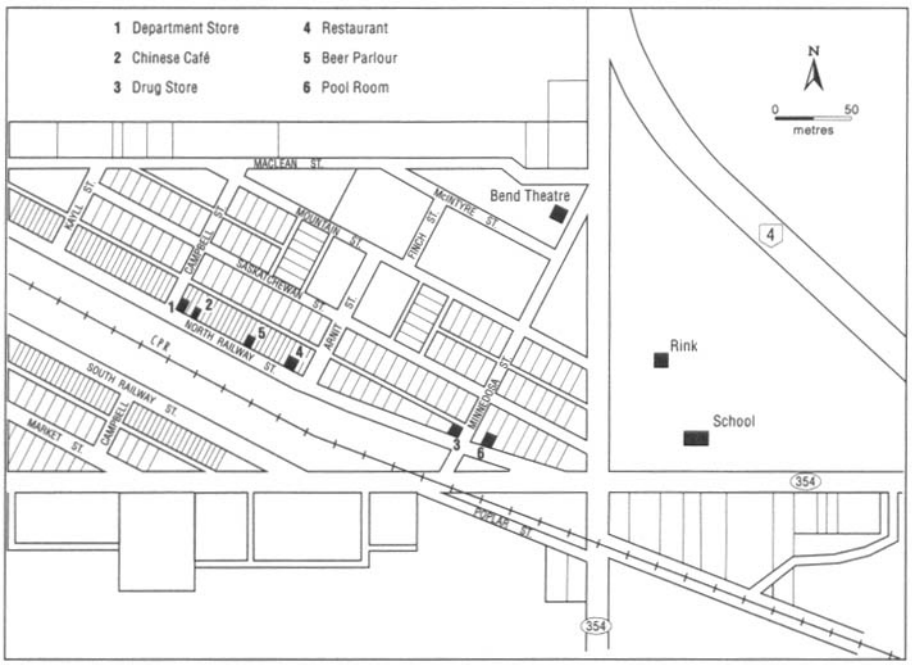

Figure 11.1.3 Strathclair during the 1950s

dry-goods store, newspaper office, garages, butcher shop, hardware store, restroom, shoemaker, and tinsmith. In the winter, there was always skating, curling, and hockey at the rink.

The routine for some was to go to the 7:00 movie at the Bend Theatre, delaying the sidewalk promenade for later. From a 35-cent allowance, children could eke out a full night's entertainment, which included a movie (complete with newsreel, Three Stooges short, cartoon, serial, previews, and draws for prizes), popcorn, Coke or popsicle, double bubble gum, jawbreakers, and a 52-page comic book. Later in the decade, many people gathered outside the electric shop, which provided an outdoor speaker connected to the 21-inch television in the window. Few realized that this box, with its flickering black and white pictures, was a harbinger of drastic change for this weekly social phenomenon that everyone took for granted.[5]

Just as the inception and growth of Strathclair were typical of many Manitoba towns, so too were the changes the town and surrounding district experienced throughout the 20th century. While agricultural service centres have waned, the surrounding farms have become larger without a corresponding increase in total area farmed, resulting in fewer farms and decreased population. Increased capitalization, mechanization, and the use of chemicals have made farming more of a competitive industry than a way of life. Money that once went to maintaining a labour force and working animals is now diverted to high-tech machines, devices, and chemicals. The fields are larger with different things in them — less summer fallow, more trash cover, and a greater variety of crops.

To facilitate the use of large machines, many sloughs have been filled in; stone piles buried; road allowances and section lines worked; traditional early-20th-century–style barns, outhouses, and granaries torn down; and bluffs and old farmsteads bulldozed. Some of these have been replaced by windward-located, Prairie Farm Rehabilitation Administration–supplied shelter belts, utilitarian steel structures, and mobile homes or ranch-style bungalows. The transportation grid serving these reorganized farms consists of wider, higher roads designed to handle the winter snow pile-up, spring runoff water, and larger, heavier machines and vehicles.

Most farm-service towns have experienced a steady decline over the last half of this century, and Strathclair is no exception. However, despite some lack of foresight, occasional political blundering, and the fluctuating economic, social, and geographic climate, pragmatic changes in role emphasis have brought about some success in the ongoing fight for survival. As districts such as Strathclair enter the computer/communication age, it is increasingly obvious that they will survive only if they can adapt to the challenge of the new technologies and integrate them with the agricultural base.

Throughout their history and evolution, the successes and character of communities such as Strathclair have come largely from their ability to draw lifeblood from communication links — foot and horse trails, fur trade and supply routes, river travel, oxcart trails, rail lines, and, later, highways with their bus routes and transport lines. Even the road grid laid out on the section-township-range survey system seemed to exist to channel farm trade into the local towns.[6]

Now, with most of these traditional lifelines either gone or rerouted to by-pass the local settlements, many towns seem to have lost the ability to communicate with the outside. Today's links to the world have changed: fibre optics and cable lines, cellular telephones, computer networks, faxes, satellite communications, and high-speed land and air travel are now the norm. Highway traffic can be lured by roadside way stations, but such traffic has little inclination or incentive to drive through every little town en route. Towns and agribusinesses unwilling to embrace new technologies that facilitate access to modern-day communications will most certainly be by-passed. Strathclair, progeny of the interplay of traditional trails of the past, now faces the complex task of exploring the myriad uncharted trails leading to the strange new frontier of the 21st century.[7]

NOTES

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Case Study 11.2
Dauphin: A Prairie Service Centre
Henry Sikora

Dauphin, the regional centre for the Parklands Region, is located in a fertile valley between Riding Mountain National Park and Duck Mountain Provincial Forest in the centre of the rural municipality of Dauphin (Figure 11.2.1). It is in an area that was once part of the bed of glacial Lake Agassiz, and as a result has some of the richest and most productive soils in the Prairies. The town was settled mainly because of the agricultural productivity of the region, and today agriculture is its main industry. Thus Dauphin is an example of the growth and decline of a single-industry community.

History to 1901

In 1739 François de La Vérendrye, an explorer, adventurer, and fur trader for the Hudson's Bay Company, first saw Dauphin Lake and named it in honour of the heir to the throne of France (the Dauphin).[1] Shortly thereafter he built a trading outpost, Fort Dauphin, on the shores of Dauphin Lake, not far from the present townsite. The fur trade continued into the early 1800s. The population of the area at that time was very sparse, composed primarily of Aboriginal and European traders.

The first recorded agricultural settlers arrived in the late 1870s, having heard an attractive description of the region from the Métis. The first surveys were carried out in 1884, and the first homestead entries were made in 1886. The original settlers came primarily from the already mostly settled areas of southern Ontario, southern Manitoba, and the northern United States.

Between 1886 and 1892, settlement of the Dauphin area continued east and west along the Dauphin Valley, between Ochre River and Gilbert Plains, and expanded further between 1893 and 1896 as a result of a rumour that the railway was coming to the Dauphin area[2]. By 1896 all the Class 1 and 2 soil areas along the Dauphin Valley were taken, and settlement even spilled over onto the more heavily treed Class 3 soils.

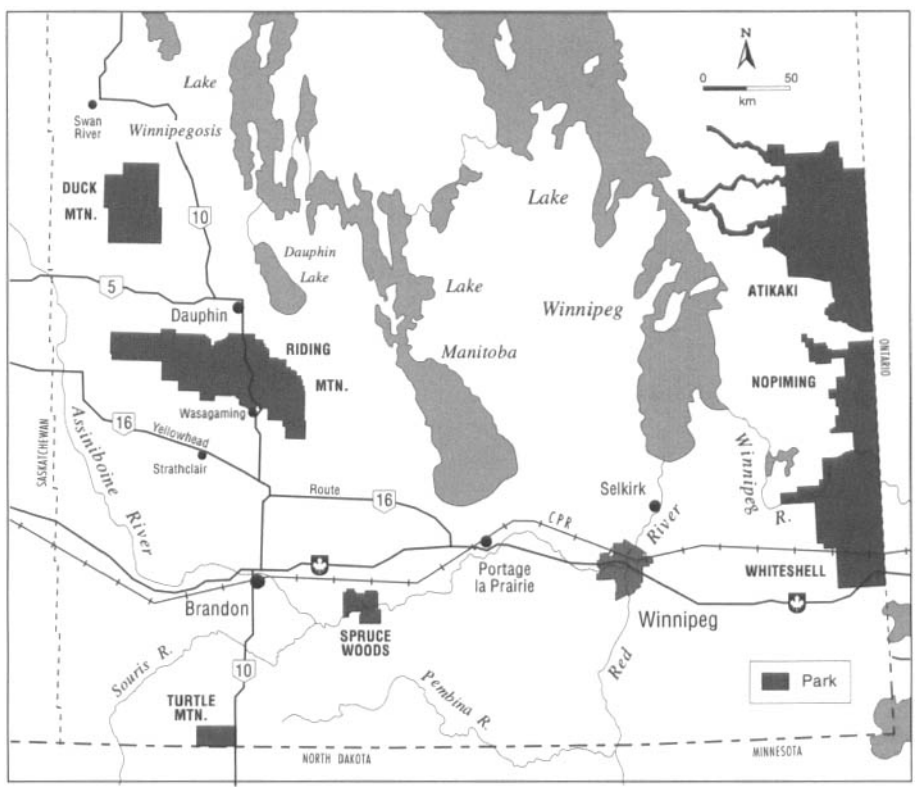

Figure 11.2.1 Selected Settlements and Parks of Southern Manitoba

By 1896 there were two recognized towns, Gartmore and Old Dauphin, in the Dauphin area, neither of which exist today. In 1897 the railway arrived and the tracks were located midway between the two communities. Recognizing the importance of a location on the railway, members of both communities relocated to this new site, physically moving their buildings and businesses. With the coming of the railway, the population in the area grew very quickly.

A second wave of settlement occurred after 1897, when the first Ukrainian settlers arrived. They settled the areas north and south of the Dauphin Valley, spreading to the more heavily wooded Class 3 and 4 soils. They favoured these lands for the woodlots and for their resemblance to their homeland. Most of the Dauphin area was settled by 1904.

Throughout the settlement period and because of the railway, Dauphin became the primary community serving the region. The railway company controlled the land that became Dauphin, and established the railway line as the main street of the community. It also had the land surveyed and subdivided. Because the railway line ran in a southeast to northwest direction, settlement occurred along this axis up to the north-south/east-west survey lines, where it then reverted to a north-south/east-west pattern, giving Dauphin its distinctive settlement

Figure 11.2.2 The Southern Part of Dauphin. The CP railway line runs diagonally across Section 10, Township 25, Range 19, W1. Roads in the older part of the town are built parallel and at right angles to the railway line. North is at the top of the photograph. (Photograph: MAPL MB 92001-54)

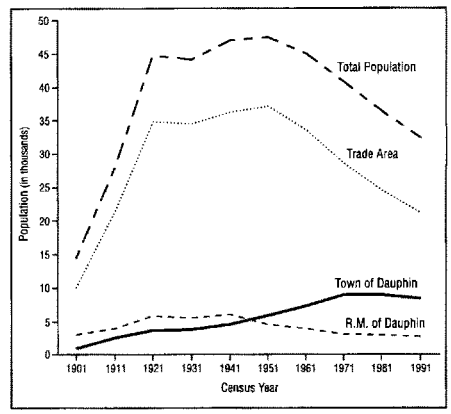

Figure 11.2.3 Population Changes in the Dauphin Area, 1901–91

pattern (Figure 11.2.2).

Dauphin was incorporated as a village in 1898 and as a town in 1901. Although exact population figures are not available, it appears that the population in 1899 was around 500, and by 1901 it had grown to 1,135.[3]

1901–41

Between 1901 and 1941 Dauphin's population grew from 1,135 to 4,662. There were three major reasons.

(1) Dauphin became the major service centre serving the growing rural population of the region. Between 1901 and 1941 the rural municipality of Dauphin grew from 3,239 to 6,069, and Dauphin's trade area (south to Riding Mountain, north to Swan River, west to the Saskatchewan border, and east to Lake Manitoba) grew from 10,309 to 36,393 (Figure 11.2.3). This regional growth occurred principally because of infilling settlement of the agricultural land as well as the growth of the settlers' families.

(2) Dauphin became the recognized regional centre for government, offering provincial, federal, hydro, and railway jobs.

(3) Finally, Dauphin grew because of its relative location, not only in terms of the railway and agricultural settlement but also as a result of its distance from competition. The larger centres of Winnipeg and Brandon had limited impact in serving the needs of the area, especially before 1941, when restrictions on mobility were much greater.

1941 to the Present

Since 1941 much of rural Manitoba has experienced massive population decline, and many areas have lost over half their rural population.[4] This decline is expected to continue, with farms becoming bigger to achieve new economies of scale. Available data indicate that the Dauphin area is following this general trend (Figure 11.2.3).

While the town of Dauphin grew between 1941 and 1981, its population today is less than in 1971. The decline has been only 5 percent, but this is significant relative to the population Dauphin serves. Dauphin's decline has resulted primarily from the diminishing population involved in agriculture. Since 1951 its trade-area population has declined by nearly 44 percent, and the rural municipality of Dauphin has gone from a population high of 6,069 in 1941 to a population of 2,669 in 1991 (a decline of 56 percent).

These trends are expected to continue. As indicated earlier, however, the growth of the town of Dauphin depends not only on its service to agriculture but also upon government and the relatively isolated location of the area. So far, the latter factors have mostly sheltered the town from the impact of the declining rural population.[5]

The Future

The economic situation of the Dauphin area is changing. Government is downsizing and long-distance travel continues to become easier. As the "information highway" expands, the strategic location of the town of Dauphin as a major centre may be weakened. Farming is expected to continue declining, at least over the next few decades. The sustainability of rural life will depend on the ability of service centres to diversify and grow.

In Dauphin, many development agencies are working on this issue, and the town knows that it must take action if it is to survive. The community is looking at expansion of tourism, opportunities in cottage industries, value-added agricultural processing, and development of specific sectors, such as building on the town's current plastics and housing businesses. If agricultural service centres do not diversify their economies, they will continue to decline as their trade areas decline.

It is too early to tell whether the current efforts will be successful, but without them, Dauphin and other Manitoba rural service centres, together with their rural lifestyles, will decline further.

NOTES

1. Two excellent sources for the history and development of Dauphin are: Dauphin Historical Society, *Dauphin Valley Spans the Years* (Steinbach, MB: Derksen Printers, 1970); and A.S. Little, *Dogtown to Dauphin* (Winnipeg: Watson and Dwyer Publishing, 1988).
2. The settlement history and settlement pattern are documented in J.M. Richtik and W.C. Bell, "Homesteading in the Dauphin Area," in *The Dauphin Papers: Research by Prairie Geographers*, ed. J. Welsted and J. Everitt (Brandon: Brandon University, Department of Geography, 1991), 55–68; and J.H. Selwood and J.M. Richtik, "Dauphin: Emergence of the Urban Cadaster," in *The Dauphin Papers*, 69–78.
3. These and all other statistics are from Statistics Canada, various dates.
4. See WESTARC Group, *Strategic Planning for Rural Development* (Brandon: Brandon University, WESTARC Group, 1989); WESTARC Group, *Prairie People: Changes and Challenges* (Brandon: Brandon University, WESTARC Group, 1989); and Prairie Farm Rehabilitation Administration, *Rural Prairie Sustainability: A Background Paper* (Winnipeg: Agriculture Canada, PFRA, 1992).
5. A statistical analysis comparing Dauphin with the province shows that Dauphin and the rural municipality of Dauphin have higher employment in agriculture, service, and retail, but fewer employed in manufacturing and processing jobs.

NORTHERN LIVING AND RESOURCE TOWNS

12

Alvin Kienetz

Although at least three-quarters of Manitoba is part of what is conventionally considered to be the "North," only about 8 percent of all Manitobans live there.[1] Moreover, the overwhelming majority of northern Manitoba's small population live in settlements of over a thousand inhabitants (such as Churchill, Flin Flon, Gillam, and Thompson) separated by vast tracts of uninhabited, or virtually uninhabited, territory (Figure 12.1).

Such sparse population density and spotty distribution is characteristic of all of Canada's North, including both provincial and territorial sections. However, compared with the northern half of the neighbouring province of Saskatchewan, and with similar latitudes (north of 53°N) of Ontario and Quebec, northern Manitoba is relatively well populated. This greater population is due to the fact that more resource towns, including some quite sizable ones (Thompson, Flin Flon, and The Pas), have sprung up in northern Manitoba than in other parts of the provincial North (Table 12.1).

Two-thirds to three-quarters (depending on the definition used) of northern Manitoba's population lives in such resource towns, most of which can be described as single-industry towns based on resource exploitation.[2] A number of fairly populous Indian reserve settlements, including the Métis and non-status Indian settlements adjacent to them, constitute the other type of large settlement, several (such as Cross Lake, Island Lake, and Norway House) having over a thousand inhabitants (Table 12.2). Although they are sometimes similar in population size, resource towns and Indian reserves (large and small) are qualitatively different types of settlement. While most of this chapter deals with the resource towns, a brief description of northern Manitoba's Indian reserve and other Aboriginal settlements is provided.

INDIAN RESERVE SETTLEMENTS

Until the last few decades, the Indian reserve settlements and non-status Aboriginal communities (such as South Indian Lake) have depended largely on the traditional Native livelihoods of hunting, trapping, and fishing. With the noteworthy exception of the Opasquiak or The Pas Indian reserve settlement, just across the Saskatchewan River from the town of The Pas, all are relatively isolated. Some Native settlements, such as those to the east and northeast of Lake Winnipeg, are accessible only by air or by winter roads (Case Study 12.2 on page 175) when the ground and lakes are solidly frozen, while all others can be reached only by often tortuous gravel roads.[3] This northeastern section of Manitoba remains an area dominated by First Nations peoples. It is part of Hamelin's "underdeveloped Amerindian North," as there are no non-Native settlements north of the now-abandoned mining town of Bissett.[4]

Such isolation, together with an inability (particularly in the case of Indian reserves) to provide collateral for loans, explain why they have been unable to attract industries or credit for financing industrial

development. As a result, unemployment and underemployment on reserves tend to be very high — not uncommonly in the 80–90 percent range — compared with an average of about 10 percent unemployment in resource towns.[5] Although an increasing number and proportion of the residents of Native settlements are migrating (particularly to Thompson, Brandon, and Winnipeg) in search of greater opportunities, such emigration is more than made up for by the continuously high — but now declining — rates of natural increase, with crude birth rates and total fertility rates two to three times those of the non-Native population.[6]

This high rate of natural increase, as well as the now higher school retention rate (lower dropout rate), has resulted in a burgeoning student population in the schools, some of which now offer education up to high-school graduation. Education is arguably the only growth industry in this region. However, because of a continuing, although now declining, scarcity of university-trained Native people, the overwhelming majority of teachers are non-Natives, with a disproportionate number hailing from the Atlantic provinces. Not surprisingly, the turnover rate for teaching staff tends to be high. Teachers are generally accommodated in subsidized modern housing, which compares favourably with the frequently substandard, unserved, and also overcrowded housing of the general population.[7]

Due to the lack of gainful employment, the average family income tends to be significantly below the provincial average and is derived largely from government social-assistance payments of various kinds. Yet, in part because of the isolation and often also because of the lack of local competition in retailing, the prices of store-bought necessities (notably food and fuel) are generally much higher than in southern Manitoba and also higher than in the resource towns of the North. As a result, a large proportion, probably the majority, of the Native population lives at the poverty level, however defined, and the chance of capital accumulation is slim.

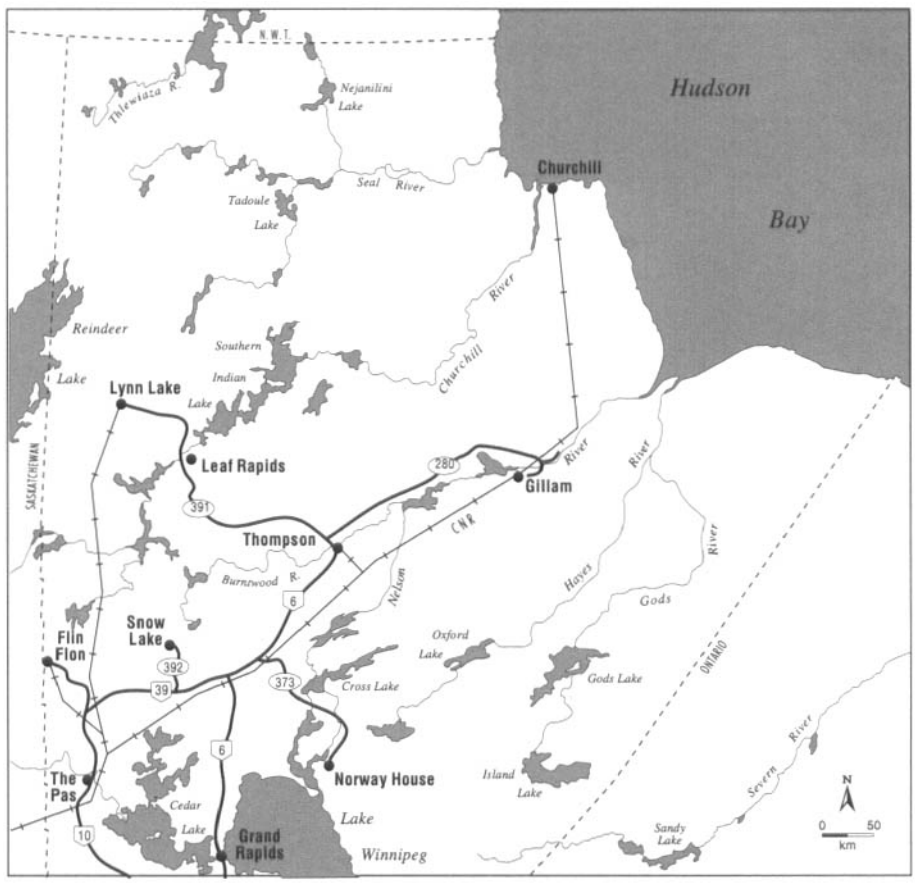

Figure 12.1 Resource Towns of Northern Manitoba

Table 12.1 Population of Northern Manitoba Resource Settlements

Resource Settlement	Population 1986	Population 1991
The Pas	6,283	6,166
Flin Flon	7,243	7,119
Thompson	14,701	14,977
Snow Lake	1,837	1,598
Leaf Rapids	1,950	1,613
Lynn Lake	1,665	834
Gillam	1,909	1,893
Churchill	1,217	1,143

Source: Statistics Canada, *Census of Canada,* 1986 and 1991.

THE RESOURCE TOWNS

The resource towns provide a vivid contrast to the reserve and non-status Native settlements, both in physical appearance and in most economic and social indicators. In terms of physical layout, they tend to be planned communities, sometimes built as company towns, whereas in the Native settlements the dwellings seem to be strung randomly along a body of water or gravel road. The establishment of most resource towns postdates that of the Native settlements, which partly explains why their housing tends to be newer and appears newer and better maintained. Resource towns generally have paved streets and concrete sidewalks, whereas Native settlements almost always lack them, and inhabitants therefore have to cope with excessive mud after spring thaws and heavy rainfalls.

In the resource towns the population is predominantly to overwhelmingly non-Native. Mainstream Euro-Canadian values and

Table 12.2 Populations of Some Northern Indian Reserves

Reserve Number	Reserve Name	Population
1	Shamattawa	743
1B	Peguis	2,892
2, 3	Chemawawin	620
3	Fort Alexander	3,237
10	Hole or Hollow Water	655
12	Bloodvein	659
13	Berens River	1,172
14	Little Grand Rapids	1,156
16	Poplar River	759
17, 17A, 17B	Norway House	3,332
19, 19A	Cross Lake	3,073
21	Stony Point	1,840
21A, 21B	The Pas	
21D	Salt Channel	
21E, 21F, 21G, 21I	The Pas	
21K, 21N, 21P	The Pas	
21L	Rocky Lake	
22, 22A	Island Lake	5,553
23	God's Lake	1,495
24	Oxford House	1,573
44, 44A	Fisher River	1,483
45	Waterhen	606
50	Fairford	1,204
66A	Pine Creek	835
170	Nelson House	2,684
171, 171A	Split Lake	1,617
198	Pukatawagan	1,737

Source: Manitoba, Highways and Transportation, *Manitoba 1994–1995 Official Explorer's Highway Map* (Winnipeg: Manitoba Highways and Transportation, 1994).

behaviour patterns set the tone, even though lately the proportion of Native people has increased significantly in some resource towns, notably Lynn Lake and Thompson. Unemployment rates tend to be low, except at times of mine or mill closure. Average family income is generally above the provincial average, in part because mine and mill labour are unionized, but also because some resource towns (notably The Pas, Thompson, Churchill, and, lately, Lynn Lake)[8] also serve as regional service centres and therefore have a disproportionate number of professionals in their work force.

A typical household would own and live in a bungalow-style dwelling, with at least two automobiles (one often a pick-up truck) in the driveway or garage. A large proportion of families also possess a second home in the form of a cottage at a nearby lake, such as Clearwater Lake and Rocky Lake in the case of The Pas. In The Pas, a sizable number of former town dwellers have chosen to live year-round at their lakeshore cottages and to commute to town for work every day, and even more have relocated to homes on acreages several kilometres from town. For these lakeshore dwellers and out-of-towners, as well as for many town dwellers, a motorboat for summer and a skidoo (snowmobile) for winter are almost essential recreational devices.

Year-round recreational opportunities also exist in town, and include an indoor public swimming pool in all but the smallest resource towns. Almost all resource towns also have an uptown multistore shopping mall. A fairly recent development is to have, as in Churchill (Case Study 12.1 on page 172) and Leaf Rapids, the uptown shopping mall joined as one enclosed complex with the town's school (kindergarten to grade 12) and health care services, so that people may move from one to the other in midwinter without experiencing the weather outside.

The well-developed infrastructure of the resource towns and the comfortable lifestyles of their inhabitants sometimes hide the fact that the economic future of such towns is far from secure, especially when the town depends on a single industry and is therefore very much at the mercy of world market forces beyond local control. When the resource is a nonrenewable one, as in the case of mining towns, which account for over half of northern Manitoba's resource towns, then resource exhaustion (ore depletion) is also a possibility.[9]

The recession of the late 1980s had a dampening effect on the economies of all resource towns. This, together with the aforementioned emigration to lakeshores and acreages in the nearby countryside, probably explains why virtually all of northern Manitoba's resource towns experienced a decrease in population between the censuses of 1986 and 1991 (Table 12.1).

Of the eight resource towns listed in Table 12.1, only Thompson registered an increase in population between the 1986 and 1991, in part because of an influx of Native people from several large reserves around that city. Snow Lake and Leaf Rapids showed significant decreases in population, while Lynn Lake's population declined to only half that of 1986, because of the closure of the mines on which the town depended.[10] The same fate appears to be in store for Snow Lake, whose mine is now in the process of closing down.

Churchill's decrease is merely a continuation of that town's long-term decline over the past several decades (from a total population of about 5,000 in the late 1950s), due to the closure of a military base there and the decline in grain shipments.[11] Gillam's population boomed temporarily in the late 1980s, when the Limestone hydro dam was being constructed on the Nelson River north of the town. It had declined somewhat by 1991, following the completion of Limestone, and is bound to decrease further, especially now that the Conawapa dam project has been postponed (Chapter 18).

In virtually all of northern Manitoba's resource towns, the current population is well below projections of two decades ago, when planners still expected a burgeoning of resource-settlement populations

within Canada's Mid-North Corridor in the wake of the federal "roads-to-resources" program.[12] Bone described this reversal succinctly: "*Resource towns* accounted for much past population growth. Now they are the principal sources of out-migration. Single industry centres have declined because of the depressed state of their principal industry."[13]

Although the long-term recession and ore depletion are the main causes of emigration from northern Manitoba's resource towns, the recent rise of environmental concerns also appears to be a contributing factor.[14] In The Pas, for instance, Repap has postponed a promised expansion of its pulp and paper mill pending the completion of environmental impact studies.

Northern Manitoba's resource towns also differ from the province as a whole in terms of their population composition. They are typically very cosmopolitan, having drawn people from all over Canada and from many other countries, including a disproportionate number of recent immigrants.[15] In the early 1970s, Finns were recruited for the pulp and paper mill in The Pas and Portuguese for Inco's nickel mine in Thompson.

Retention of ancestral languages appears to be weak, however, perhaps because there are not enough people of any one national origin to form organizations based on ethnic origins. Even in Thompson, which has set up a multicultural centre to publicly acclaim the various heritages of its population, the children of immigrants tend not to retain their parents' language.[16] Such second-generation linguistic assimilation suggests that the northern resource towns are true melting pots, at least for non-Native people. Even for French, which receives various kinds of government support because of its official status, retention rates tend to be lower than in urban centres in southern Manitoba (Table 12.3).

Table 12.3 French-Language Retention Rates in Manitoba Settlements

Settlement	Number of People of French Origin	Retention Rate, %
Northern Manitoba		
Lynn Lake	85	33
Thompson	975	32
Churchill	85	29
Leaf Rapids	140	25
Gillam	95	17
Flin Flon	415	15
Southern Manitoba		
Winnipeg	41,430	48
Dauphin	325	48
Steinbach	80	55

First Nations people remain the only clearly visible ethnic group in northern resource towns, which have attracted increasing numbers of Native migrants in recent years. Linguistic Anglicization has also turned most Native town dwellers into virtually unilingual Anglophones. Recently this has been countered by attempts to re-emphasize Native distinctiveness, but none of northern Manitoba's resource towns has yet followed Winnipeg's example and introduced explicitly Native schools and curricula, although this has been done on the larger reserves. The current emphasis on retaining — and for many Natives, rediscovering — one's Native heritage and ethnic identity may appear surprising because, at least among young people, social interaction between Natives and non-Natives is more prevalent today than before.

In terms of their age-sex composition, resource-town populations have traditionally been described as predominantly male and relatively young, with hardly any retirees and few job opportunities for women.[17] But this appears no longer true for the older, more settled communities such as The Pas and Flin Flon (Figure 8.2 on page 111). A preponderance of unmarried young males also helps explain the rootlessness and lack of commitment to community that are considered typical of resource towns.[18]

Most Canadians apparently would not want to live in northern resource towns. Those who choose to seem to make that choice mainly for economic reasons (higher wages and salaries), although a preference for living close to nature and an enjoyment of hunting and fishing are also cited as secondary reasons for settling in a northern resource town.[19]

Psychological traits that are considered characteristic of northern resource towns are feelings of isolation and, at least in mining towns, insecurity about their economic future. Feelings of isolation are understandable when one considers the enormous distances that separate the towns from Manitoba's southern centres and from each other. The isolation has been reduced somewhat by good paved highways (Highways 10 and 6; Figure 12.1), by regular bus service, and especially by regular air service. But air fares are very expensive: a return fare between The Pas and Winnipeg costs as much as one between Winnipeg and Toronto. Living alone, or even in a nuclear family with no other relatives nearby, no doubt increases the feeling of isolation.

Boredom is apparently also a problem for many northern resource-town inhabitants, especially married women who are solely homemakers. In 1975, Riffel wrote:

> Life in many resource towns is organized around the "mill whistle" and daily shift routines. Access to information and the media tends to be limited. Communications and access to southern centres is difficult. The use of discretionary time can be problematic, especially for wives who are not working. Boredom among unemployed wives has been correlated with a high rate of mental illness in resource towns.[20]

Resource towns seem to have become more satisfying places for women today, but a 1987 federal government report suggested that progress in providing job opportunities for women in resource towns has remained too slow.[21] Today about two-thirds of the employment in northern Manitoba and its re-

source towns is in the service sector,[22] so the "mill whistle" no longer controls the lives of most inhabitants to the extent that it once did. But other characteristics of the North and its resource towns continue to distinguish it from Manitoba's southern centres. Its continuing distinctiveness is summarized in the recent *Benchmark Report* on northern Manitoba:

> Northern Manitoba is a vast territory. Given the distances, northerners have limited opportunities to come together to forge common outlooks, ideas and plans. Nevertheless, the people of the North to some extent share a common identity — an identity forged by factors such as a certain connection with the northern environment and a common feeling of isolation from decision making that affects their day-to-day lives.[23]

NOTES

1. The four census divisions numbered 19, 21, 22, and 23 are generally considered to make up northern Manitoba. *Northern Manitoba: A Benchmark Report* (Thompson: Northern Manitoba Economic Development Commission, 1993), 12, 45; R.M. Bone, *The Geography of the Canadian North: Issues and Challenges* (Toronto: Oxford University Press, 1992), 74, 90. Bone also discusses extensively (8–9 and 242–5) Hamelin's pioneering effort to identify the North in terms of nordicity indices. See Louis-Edmond Hamelin, *Canadian Nordicity: Its Your North Too* (Montreal: Harvest House, 1979).
2. Resource towns are defined here as those that are dependent on production or export of resources, including mining, pulp and paper, and hydro construction.
3. The hazardous driving conditions of these gravel roads probably contribute to the high incidence of fatal traffic accidents among Native people in northern Manitoba.
4. Hamelin, *Canadian Nordicity,* ch. 7.
5. In 1986 the unemployment rate for Manitoba resource towns was 13 percent, higher than the provincial average, because of layoffs caused by the recession and some mine closures. *Northern Manitoba: A Benchmark Report,* 42.
6. Bone, *The Geography of the Canadian North,* 84, 195-6; J.A. Riffel, *Quality of Life in Resource Towns* (Ottawa: Information Canada, 1975), 58–9.
7. Ibid., 56; *Northern Manitoba: A Benchmark Report,* 32.
8. Ibid., 21, 23; D.C. Walker, *Lynn Lake and Northwest Manitoba: An Alternative Community Future* (Winnipeg: Institute of Urban Studies, University of Winnipeg, 1988), 64, 76.
9. Both Lynn Lake and Snow Lake have gone to extremes to find alternative economic bases and/or purchasers for town housing. Thus the mayor of Lynn Lake proposed that the unused mine shafts around Lynn Lake be used as storage facilities for nuclear waste, while more recently a news report stated that Snow Lake, located near scenic Wakusko Falls, was seeking to attract retirees from Japan to come and purchase housing in Snow Lake as summer residences.
10. Walker, *Lynn Lake and Northwest Manitoba,* 16, passim.
11. P.D. Elias, *Metropolis and Hinterland in Northern Manitoba* (Winnipeg: Museum of Man and Nature, 1975), 13.
12. Bone, *Geography of the Canadian North,* 62–6. Thus in a 1973 publication one town planner stated with confidence that by 1975, only two years later, the town of The Pas "is expected to have a population of about 12,000." W.F. Lengerke, "Impact of Special Area Program: The Case of The Pas, Manitoba," in *Developing the Subarctic,* ed. J.R. Rogge (Winnipeg: University of Manitoba, Department of Geography, 1973), 104–11. See also I. Wallace, "The Canadian Shield: The Development of a Resource Frontier," in *Heartland and Hinterland: A Geography of Canada,* 2nd ed., ed. L.D. McCann (Scarborough, ON: Prentice Hall Canada, 1987), 443–81.
13. Bone, *Geography of the Canadian North,* 93.
14. *Northern Manitoba: A Benchmark Report,* 64–5. Bone devotes a whole chapter to "Environmental Impact of Resource Projects" in his book. See Bone, *Geography of the Canadian North,* ch. 7 (157–79). For a recent book dealing with northern Manitoba from a strongly environmental perspective, see J.B. Waldram, *As Long as the Rivers Run: Hydroelectric Development and Native Communities in Western Canada* (Winnipeg: University of Manitoba Press, 1988).
15. J. Rogge, "Comments on Labour Force Origin and Turnover in Northern Manitoba," in Rogge, *Developing the Subarctic,* 127–44.
16. A. Kienetz, "Ancestral Language Retention in Northern Manitoba," in *Prairie and Northern Perspectives: Geographical Essays,* ed. H.J. Selwood and J.C. Lehr (Winnipeg: University of Winnipeg, Department of Geography, 1989), 33–44.
17. Riffel, *Quality of Life,* 25, 33.
18. A. Himelfarb, "The Social Characteristics of One-Industry Towns in Canada," in *Little Communities and Big Industries,* ed. R.T. Bowles (Toronto: Butterworths, 1982), 16–42; L.D. McCann, "Canadian Resource Towns: A Heartland Hinterland Perspective," in *Essays on Canadian Process and Form II,* ed. R.E. Preston and L.H. Russwurm (Waterloo, ON: University of Waterloo, Faculty of Environmental Studies, Department of Geography, 1980), 213–67. Similarly in L.D. McCann, "The Changing Structure of Canadian Resource Towns," in Bowles, *Little Communities and Big Industries,* 61–81.
19. Riffel, *Quality of Life,* 22; Canada Employment and Immigration Advisory Council, *Canada's Single-Industry Communities; A Proud Determination to Survive* (Ottawa: Minister of Supply and Services, 1987), 38–9.
20. Riffel, *Quality of Life,* 10.
21. Canadian Employment and Immigration Advisory Council, *Canada's Single-Industry Communities,* 21.
22. *Northern Manitoba: A Benchmark Report,* 44–5.
23. Ibid., 14.

Case Study 12.1
Churchill: Historic Settlement, Arctic Seaport, Tourist Centre

Geraldine Sweet

The shortest sea route from the Prairies to Europe is via Hudson Bay and the North Atlantic, so it makes sense to have a port on the coast of the bay. Thus it was that, at the urging of the Prairie wheat farmer, a port was established at the mouth of the Churchill River (Figure 12.1.1). The Hudson Bay Railway was completed in 1929, and in 1931 two ships left the grain terminal late in the summer to carry much-needed grain to the markets of the Old World.

This, however, was not the beginning of trade through the bay. One of the oldest European settlements in Canada, Churchill was the centre of the Hudson's Bay Company, became the site of a major strategic armed forces base, and later became the home of an international atmospheric research centre. It still houses the Institute of Arctic Ecophysiology and the Churchill Northern Studies Centre.

It is much older than all of these, however. Point Dorset remains have been found on the west bank of the Churchill River, and historically this location has been a meeting place for the Dene, the Cree, and the Inuit for hundreds of years. In recent years it has been established that the best place in the northern hemisphere to see the aurora borealis is over Hudson Bay, where the activity is at its most intense. Also, the southernmost polar-bear migration route lies between Cape Churchill and the Nelson River. These last two factors alone make the area around Churchill one of the most interesting scientific and tourist locations in Canada.

Figure 12.1.1 The Town of Churchill on the East Side of the Churchill River. The grain terminal is on the river shore and the town centre faces northward, towards Hudson Bay. Fort Prince of Wales is located on the peninsula west of the river mouth. North is at the top of the photograph. (Photograph: NAPL A22955-20)

Ecology

Located at 58°46' N and 94°09' W, Churchill sits at the boundaries of geologic, climatic, and vegetation regions. The line dividing continuous and discontinuous permafrost runs near here, and associated with it is the tree line, which can be seen very clearly in the area (Figure 4.14 on page 52). There is also a very obvious boundary between land and water. Churchill is on the migratory path of many birds, and a number of species come here to breed. Polar bears and beluga whales are annual residents.

The bedrock geology is generally buried under a mantle of glacial and postglacial deposits, and the area is dotted with eskers, beach ridges, and tundra ponds. As a result of isostatic sea level changes, raised beaches are found as much as 40 km inland at heights of up to 183 m above sea level.[1] Around the town and along the shore, huge masses of greywacke, a fine-grained conglomerate, have been thrust up from the Canadian Shield, through the sedimentary dolostones, which can be seen only at low tide. The greywacke has been smoothed by the glaciers to create a stark landscape, dotted with clumps of stunted conifers.

The rocks provide ideal hiding places for the polar bears and shelter for a wonderful variety of arctic plants — tiny orchids, miniature rhododendron bushes, a variety of willows, strawberries, and blueberries are all found among the rocks and on the better-drained gravel ridges. Labrador tea, asphodel, and azaleas cover the palsas, or peat mounds, and a variety of willows and myriad

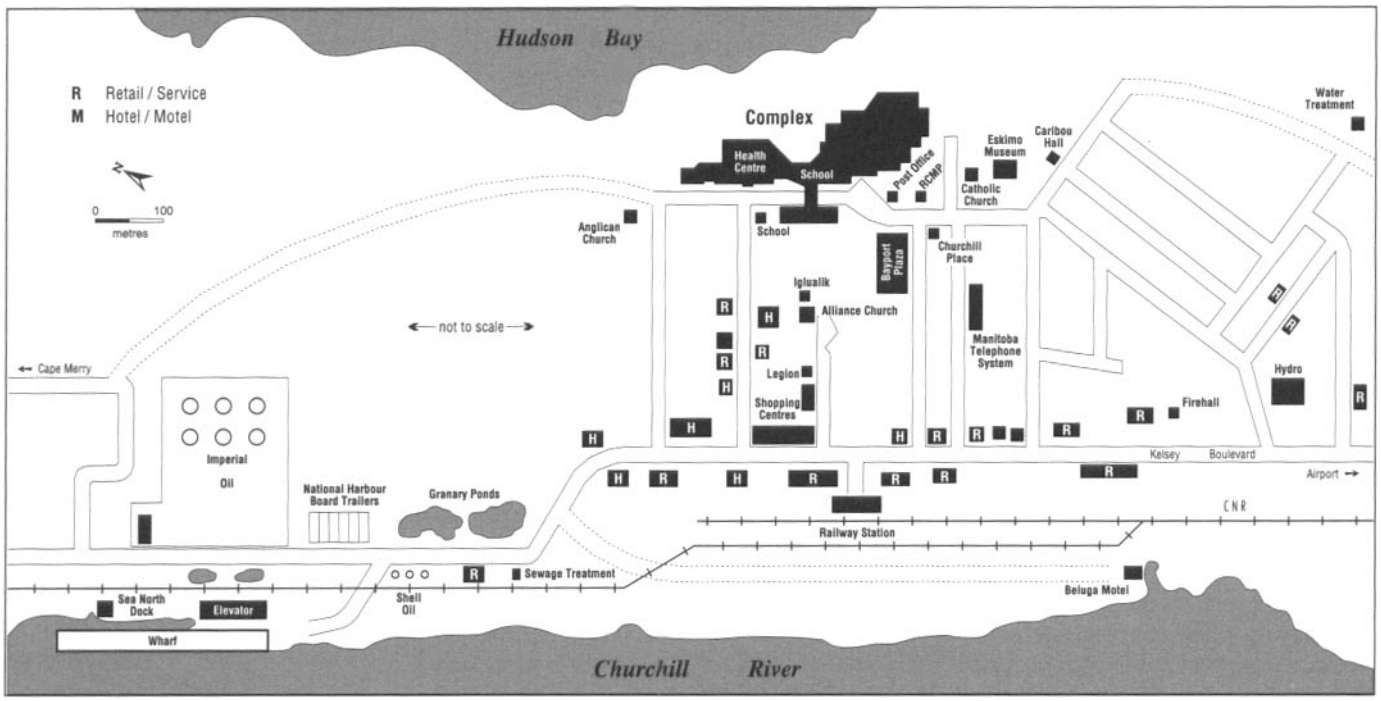

Figure 12.1.2 The Layout of the Town of Churchill. Scale and orientation vary.

grasses cover the lower-lying land between the hundreds of shallow ponds. Inland, the tundra gradually gives way to the boreal forest. First small clumps of trees appear, especially on the better-drained ground, then more small trees spread over the landscape, until about 15 km south of the town the forest takes over with black and white spruce and tamarack.

The climate is described as continental, according to the Köppen classification, and more specifically as "cold continental," with cool summers and very cold winters (Chapter 3). Churchill is far enough north that daylight in midwinter lasts only five or six hours and there is snow on the ground from October to May.

The effect of Hudson Bay is quite startling. Ice remains on the bay until late July, and if there is an onshore wind at that time, the coast will be icebound, with temperatures close to or below freezing. If there is an offshore wind, the ice moves out and temperatures reach the upper 20s Celsius. Ice does not cover the bay until late November. Temperatures remain quite high as a result, and it is not unusual for Churchill to have higher temperatures than Winnipeg in the fall. In midwinter, temperatures fall to the -40°C range and strong winds from the bay produce frequent blizzard conditions. Total precipitation is less than 100 cm, but although there is not a great deal of snow, the arctic winds blow it into huge drifts.

The Town

The present town of Churchill is only 60 years old, built around the railhead on the east bank of the Churchill River (Figure 12.1.2). Some buildings were moved across the river from the old fort (Fort Prince of Wales), including the Anglican Church and some of the warehouses, but the first homes for railway and terminal employees were built in the shadow of the terminal or on the rocky outcrop leading to Cape Merry. The church is still there, but little else remains of the early buildings except the railway station and the grain elevators. Over the years most of the buildings have been constructed from prepackaged kits and have needed to be replaced frequently. As a result, there are few houses dating from the 1940s; the town is dominated by post-1960s buildings.

The town today is confined to a narrow peninsula of rock jutting out into the bay (Figure 12.1.1). It is laid out along a wide, dusty main street that parallels the river and the railway. A number of short streets run perpendicular to this, rising gently to the town centre at one end and the cemetery at the other. Visitors to both may see polar bears and whales in the sea beyond. Land use is somewhat unconventional, although there is a central business area with a small mall, which contains the bank, the liquor store, a Parks Canada centre, and a health club.

Individual houses, hotels, and motels mix along the short streets, and the newest row of bright blue townhouses is next door to the hardware store and opposite the bakeshop and garage. There are, however, several predominantly residential streets with typical townhouses and a few single-family dwellings, all prefabricated, with tiny yards and locked wooden garbage sheds. In some of the yards an attempt has been made to landscape with trees brought from the boreal forest and imported soil to maintain a tiny square of grass. The sheds are strongly constructed to keep local pests — polar bears — out of the garbage. Several motels line the main street, along with The Northern grocery and department store, and The Arctic Trading Post with its Aboriginal crafts. At the other end of town, the Eskimo Museum, the Catholic Church, and the town centre complete the picture.

The town centre, finally built in the 1970s, includes the hospital and medical centre, the high school and library, a swimming pool, curling and skating rinks, a restaurant, a playground, and a number of offices — all under the same roof. It is also linked to the elementary school. Built on several levels, with a magnificent view of the bay, it is one of the greatest and most expensive achievements of the local government. It cost the taxpayers of Manitoba $10 million to serve a population of less than 1,200, but it is a model for northern communities and would cost over $25 million to replace.

The grain elevators still dominate the harbour and the town, but only physically (Figure 12.1.1). In 1994 only nine grain ships were handled at the port, despite the requests of the Russian government for their ships to pick up cargo from Churchill. Well upstream, much of the water in the river is diverted to the Nelson for hydro-electricity (Chapter 18); as a result the Churchill River is very shallow and the channel at the port has to be dredged. The port is also used to ship cargo to the northern communities.

The tourist industry is more important for the population, and almost every family has someone working in an aspect of that industry. From September to November the hotels enjoy 100 percent occupancy, as people arrive from all over the world to see the polar bears. Tundra buggies, driven by local residents, carry visitors to the shoreline east of the town, where the bears congregate to wait for the ice to develop on the sea. In the early summer, a modest number of tourists come to see the birds, the whales, and the wildflowers. A few come simply to be able to say they have seen the Arctic. All these people contribute to the local economy by paying for their tours and hotel rooms and by buying a few souvenirs or examples of local art. Estimates of the number of tourists vary considerably, but about 8,000 per year may not be unrealistic, representing a sizable income for the community.

Employment in both the grain industry and tourism is, of course, only seasonal. A significant percentage of the working population is involved in some aspect of government, Churchill being a centre for both provincial and federal services for the north. Most of the civil servants remain in the area only for their term of office.

All this might paint a bleak picture — cold climate, seasonal employment, and few amenities. Certainly Churchill is not the most attractive town in the province, but the real Churchillians are optimistic and enthusiastic about their town and about living on the frontier. They believe in their community and are working hard to ensure its survival. Listed among the assets of the town in a recent government report on tourism and the feasibility of creating a national park in the area were the "caring attitude of the population" and the "entrepreneurial spirit of the residents."

In the late 1970s, after the Canadian Forces base closed, the town looked almost abandoned. Garbage was lying around, old vehicles were abandoned, houses were falling into disrepair. But not today. The streets are dusty but not dirty. Most yards are tidy, and all household refuse is in closed units. The townsite looks wind-swept, but there is little rubbish blowing in that wind. Trees and soil are brought in for landscaping around public areas. A lawn in front of the medical centre is lovingly tended all summer.

A local resident developed and runs the Arctic Trading Post, and encourages local and northern artisans. Local residents not only run the various adventure tours but have made it their business to become experts on the wildlife of the region and to police the use of the delicate landscape. A local resident is experimenting with growing tomatoes, lettuce, and other vegetables at the Boreal Gardens. The community has a very large number of people who want to see the town survive.

What does the future hold for this town? There is a large new grain market in eastern Europe and Russia, which could mean a revival of grain handling, and the port facility will still be needed for shipment of goods along the coast. But the only ground access is the railway, and maintaining and upgrading the track are very expensive and low on the priority list of the railway company. The tourist industry is on solid footing and with good advertising could expand, as it does not depend on ground transport.

There has been a great deal of lobbying for Churchill to become Canada's "space port," and some primary development has already begun. Every effort is being made to get the road extended over 300 km from its present terminus at Gillam (Figure 12.1 on page 168). Despite the distances involved, the road would lessen the sense of isolation, but it would also destroy the frontier feeling that undoubtedly still exists. The people of Churchill are determined to maintain and even expand the town.

NOTES

1. E. Nielson et al., *Surficial Geological Map of Manitoba Map 81-1* (Winnipeg: Province of Manitoba, Department of Energy and Mines, 1981).

Case Study 12.2
Winter Roads
Richard H. Foster

Manitoba's winter roads comprise a system of snow and ice roads that extend beyond the network of all-weather roads and highways (Figure 12.2.1). They are normally usable for only about 50 days each year, from the latter half of January through mid-March. Winter roads are also found in all other provinces and territories except Nova Scotia and Prince Edward Island.

The primary purpose of Manitoba's winter roads is to provide temporary land access for isolated communities, most of which are Native reserves. Populations in these communities range from about 300 to over 2,200 (Table 12.2), although the three communities along the western shoreline of Island Lake — Waasagomach, St. Theresa Point, and Garden Hill — are relatively close together and have a combined population of approximately 5,200 (Case Study 9.2 on page 134).

Winter roads in Manitoba date back at least to the early 1940s, when tractor trains were used to supply winter fishing camps on some of the province's northern lakes and, in turn, transport the fish caught to points from which they were shipped to markets across North America. These roads were largely the creation of the Sigfusson Brothers Transportation Company, originally of Lundar, Manitoba, which carved them through the bush and hauled freight on them until 1972.[1] Their winter road network of nearly 6,000 km stretched across northern Manitoba and into northwestern Ontario and northeastern Saskatchewan. The maximum extent of the network in Manitoba was reached in the late 1960s, when it totalled about 4,000 km.[2]

In 1971 the provincial government took over control and operation of the winter roads. Since then, many of the roads have fallen into disuse, while other portions have been upgraded to become part of the province's network of all-weather roads (e.g., between Lynn Lake and Thompson). As a result, only about

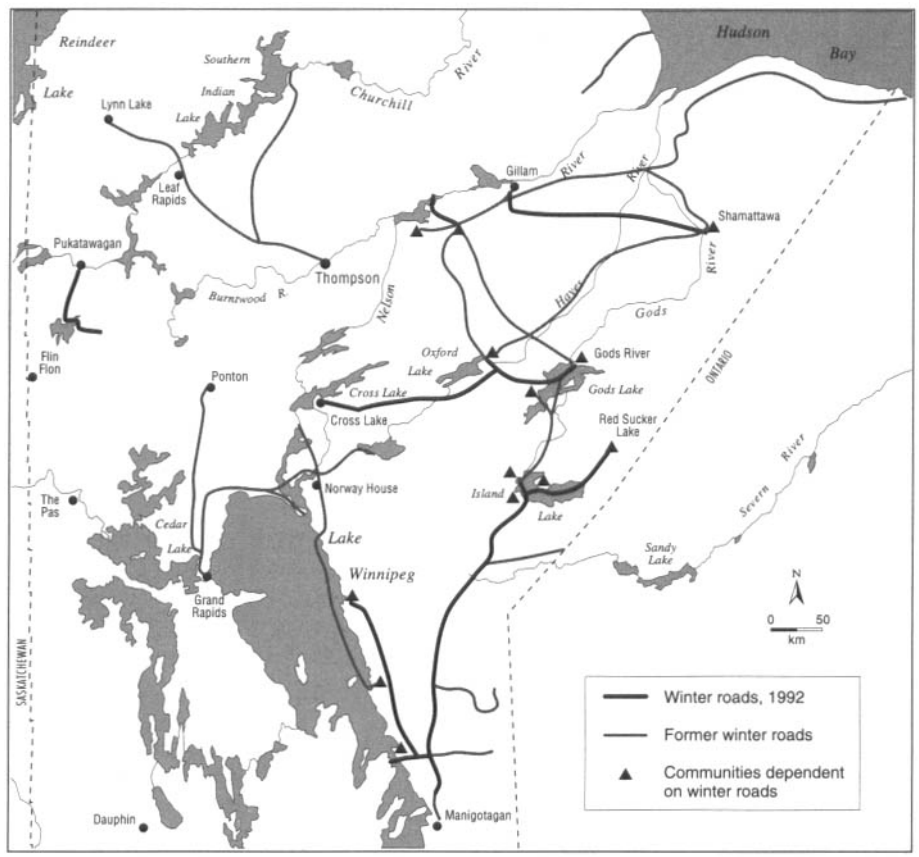

Figure 12.2.1 The Winter Roads of Manitoba, Past and Present (Source: Location of former roads from S. Sigfusson, Sigfusson's Roads *[Winnipeg: Watson and Dwyer, 1992], inside front cover)*

1,600 km remain in Manitoba. East of Lake Winnipeg, 830 km of winter roads form a continuous network, with the main route between Manigotagan and Red Sucker Lake being 531 km long. Northeast of Lake Winnipeg there is a 347 km stretch between Cross Lake and Gods River, and the route between Gillam and Shamattawa is 224 km long. The other five routes, all in northern Manitoba, together total only 215 km (Figure 12.2.1).

The provincial Department of Highways and Transportation is responsible for overseeing the construction and maintenance of winter roads, although much of the actual work is carried out by Native-run companies. With minor variations, the same routes are followed from year to year. The annual construction process begins with an aerial reconnaissance of the routes, usually in early December, when there is a good snow cover. If the weather has been sufficiently cold for frost penetration and water freeze-up, construction can start during December; otherwise, it is delayed. Since these roads are located in wilderness areas, considerable care is taken to minimize potential damage to the natural environment. For example, as few trees as possible are removed, and provincial government policy does not permit the destruction of beaver dams.

Two types of winter roads are built: snow roads and ice roads. Snow roads generally traverse swamp or muskeg, although they also cross "dry ground" and "ridges" of Canadian Shield bedrock. The first step in construction is to clear the right-of-way of downed trees and other debris and to level the road base as much as possible. Snow is not allowed to become too deep because it acts as ground insulation and retards frost penetration. When frost has penetrated 15 cm, tracked vehicles such as snowmobiles and small bulldozers can build up and compact the

snow. As the compacted snow thickens to about 20 cm, heavy graders, often pulling log or steel I-beam drags, continue the compacting and levelling. This process is repeated many times before a road is ready. A completed snow road is approximately 9 m wide.[3]

Ice roads that sit atop frozen lakes are about 60 m wide so that a narrow strip of ice does not bear the continuous pressure of vehicular weight. They form naturally when lake surfaces freeze, but to support heavy trucks, ice must be at least 70 cm thick; thus, measurements are taken daily by Highways Department inspectors. Once the thickness of lake ice reaches at least 25 cm, light equipment can be used to clear snow from the designated route in order to accelerate the rate of ice formation. Gradually, heavier equipment is used to keep the ice bare. Vehicular speed on ice roads, especially that of heavy trucks, is restricted to about 15 km per hour because the weight and forward motion of traffic cause wave action beneath the ice. Too much wave action can result in buckling of the ice. As a result, the 400 km trip between Manigotagan and Island Lake, partly on ice roads, takes about 12 hours.[4]

A variation on the ice road is the ice bridge, which is essentially an ice road across a stream. Whereas ice roads on lakes rely mainly on natural (blue) ice, thickness across streams is commonly augmented by flooding the crossing and letting the water freeze. This process strengthens the stream crossing and raises the ice bridge closer to the level of the road proper, thereby reducing the grade of descent and ascent. Ice formed by surface flooding (white ice) has about half the load-bearing capacity of blue ice.

Because of the short life of winter roads each year, construction proceeds as fast as possible and truckers are on the roads as soon as they open. As a result, considerable repair usually is needed from the outset, especially on any snow road that may not be sufficiently compacted to handle the volume and weight of traffic at an early date.

Winter roads enable semitrailer trucks to supply isolated communities with most of their yearly needs of bulk goods (Figure 12.2.2). Fuels, building materials, machinery, and groceries are the principal commodities shipped in a thousand or more truckloads.

Figure 12.2.2 Heavy Truck on Ice Road. This truck and its load of diesel fuel weigh approximately 36,000 kg. It is on the ice road atop Island Lake headed north to the community of Garden Hill. (Photograph: R.H. Foster)

Air transport is the year-round alternative, except for communities located along the eastern shoreline of Lake Winnipeg, which are able to rely on the water link to Selkirk because the lake is ice-free for more than half the year. Some goods, particularly foodstuffs, are flown in throughout the year, but it is expensive to do so. On average, shipping freight by truck costs about one-tenth the rate by air.

Besides having economic value, Manitoba's winter roads are open to the public, so contacts between communities on the network are facilitated when these roads are open. Their residents also travel beyond the winter roads (to Winnipeg, for example), while relatives, friends, and others are able to visit the communities from the outside. Although the length of the winter road network will gradually be reduced as the system of all-weather roads expands, some routes will undoubtedly continue to function for many years. The role of these roads in providing seasonal access to and from isolated communities in Manitoba for more than half a century is testimony to their importance.[5]

NOTES

1. S. Sigfusson, *Sigfusson's Roads* (Winnipeg: Watson and Dwyer, 1992).
2. L.B. Birdsell, *Manitoba Winter Roads Study* (Winnipeg: I.D. Engineering, 1984).
3. K.M. Adam, *Building and Operating Winter Roads in Canada and Alaska* (Ottawa: Department of Indian and Northern Affairs, Environmental Studies No. 4, 1978).
4. R.S. Grant, "Manitoba's Ice Roads," *Canadian Geographic* 104(December 1985/January 1986):56–63.
5. Special thanks to Robert McLeary of the Manitoba Department of Highways and Transportation, who took me on the roads and provided information for this article.

ELECTORAL BEHAVIOUR IN MANITOBA: THE CONVERGENCE OF GEOGRAPHY AND POLITICS

13

Meir Serfaty

This chapter focuses on what is perhaps the most exclusively political subject of all: the temporal and spatial distribution of party support in federal and provincial elections. This approach will help us decipher differences in ideological perspectives held by elements of Manitoba's population. These differences, which are partly due to geographical factors, have combined with class and ethnic distinctions to create fairly distinct political cultures[1] in the province. Through this focus we can also establish how the recent historical development of party identification along regional lines has affected public policy, and how the latter, coupled with external factors, has in turn altered this pattern of identification.

THE CONCEPT OF REGIONALISM AND ITS APPLICATION TO MANITOBA

The concept of regionalism is deeply embedded in the study and practice of Canadian politics. Numerous studies have attempted to demonstrate that Canada is a country of regions, each with distinct geographical configurations, historical and cultural patterns, values, norms, attitudes, demands, structures, parties, and electoral tendencies.[2] The Maritimes, the West, Quebec, and Ontario have all been studied as regions. Because of the growth of "provincialization" in Canada, the regional approach is coming under increasing scrutiny,[3] but it remains prevalent, both in the literature and in the collective consciousness of Canadians.

In contrast, the lack of studies that focus on intraprovincial political regionalism is striking. One scholar who has examined regionalism in Ontario claims that political scientists have long falsely assumed that regional sentiments are connected to the presence of regional governments, and that laws, parties, and political institutions are the prime cause of regional sentiments. These may be found in provinces and sometimes in larger regions, but seldom, if ever, in smaller intraprovincial regions.[4] Yet we are aware that deep, intra-provincial differences exist, ranging from distinct patterns of electoral support to social composition, economic disparities, and feelings of economic exploitation. Strained centre-periphery relations may engender well-defined beliefs and cultures that are manifested in party support.

An intraprovincial regional approach appears ideally suited to a study of Manitoba for several reasons: (1) it can help us understand socioeconomic and political variations in different areas of the province; (2) Winnipeg is the undisputed "centre" of the province (although it was not always so) and has acted as an immense centripetal force, becoming a microcosm of political cultures and provincial patterns of voting behaviour; (3) Manitoba itself may be regarded as the political and geographical centre of Canada; and (4) regional identity patterns make explanation and even predictions easier to generate. In essence, one may hypothesize that Manitoba appears an ideal locus for understanding the relationship between geography and politics.

REGIONAL ASPECTS OF MANITOBA'S POLITICAL CULTURES

Manitoba's designation as Canada's "keystone province" has been a significant feature of its political and social life. The fact that it is centrally located has had a clear impact on the way its citizens and governments perceive themselves with respect to the rest of the country. The name, however, implies more than just a locational fact.

Experts have alluded to the nature of the province as the most characteristic of all provinces: the "median or average province,"[5] the least western of all western provinces, and the most federalist of them. It is medium-sized, the fifth-largest of the provinces, more advanced economically than the Atlantic provinces but less than the others. It has a strong contingent of ethnocultural groups — in fact, non-British, non-French groups constitute a majority of its population. It has the fourth-largest Francophone community in the country.[6] Its economy is less susceptible than others in the West to the fluctuations of single commodities. Finally, studies of political culture show that, *on the whole,* Manitobans have greater political trust and a greater sense of efficacy, are more deferential and less dissatisfied than their western cousins, and are more like Ontarians.[7]

There is a problem, however, with this image of moderation. Because studies of political culture have been mostly national or regional (namely, attempting to show similarities and differences *between* provinces), they have failed to take into account intraprovincial differences. There is no published research regarding how Manitobans differ spatially from one another in attitudes, orientations, and values.

With the sole exception perhaps of British Columbia, Manitoba contains deeper geographically based cleavages than any other Canadian province. Tensions between its rural and urban populations, between the "north" and the "south," and between the centre and the periphery have been reflected in electoral politics and in public policies instituted by governments of different ideologies.

In this respect, the pattern of settlement and the geographical environment have played a large role. The province differs from its western counterparts in being populated primarily by Ontario and Quebec emigrants, and not until later by people from Europe or the United States.[8] As shall be seen, this has greatly affected ideological perspectives. Significantly, the rich southern agricultural areas differed substantially from the less affluent central agricultural areas and attracted people of different ethnic and ideological traditions. The northern resource-based lands were populated early exclusively by Aboriginal peoples, but later became a magnet for an array of groups distinguishable along class-ideological lines. In Winnipeg, Portage Avenue has traditionally been regarded as the dividing line between the working class to the north and the business and professional community to the south; in Brandon, First Street and Pacific Avenue have divided a distinct east and west, north and south.

Essentially, therefore, we may speak of many Manitoba political cultures: a southern rural, a central rural, a northern frontier, a Winnipeg south, a Winnipeg north, a Brandon east, and a Brandon west.[9] In addition, the Francophone population has had a fairly distinct culture. These well-defined cultures cooperated with one another to create, in effect, governing coalitions. After World War I, the system became polarized along ideological lines reflecting class distinctions. Later, ethnic distinctions were added to the mix.

The irony of Manitoba's political landscape, then, is that most national social, cultural, and economic indicators make it a "typical" Canadian province, but its internal political geography has been consistently and predictably polarized.

ELECTORAL CHANGE: AN OVERVIEW

An American political scientist, V.O. Key, theorized in 1959 that elections may be "maintaining," "deviating," or "realigning." In maintaining elections, political parties that normally vie for support receive popular votes and seats in a manner that does not alter the status quo: parties may replace each other in a normal pattern, or one party remains dominant for a period of time. In a deviating election, a third party receives votes and seats inconsistent with the normal pattern, but subsequent elections restore the pattern. In a realigning election, a radical — usually a protest — new party inexorably and permanently alters the political landscape by asserting itself as a durable contender and usually as a governing group.[10]

To this model can be added a new category, a "pattern-breaking" election, where one or several new parties emerge as serious contenders, and then go on to obtain power and change the electoral map. Pattern-breaking elections are followed by realigning ones. Both of these types are characterized by the virtual demise, more or less permanently, of one or several of the previously established political parties.[11]

Manitoba has had examples of all of these types in provincial elections. The periods 1871–1920 and 1927–57 were characterized by maintaining elections, with, in the first instance, Liberals and Conservatives alternating in power unchallenged, and in the second, the Liberal-Progressive coalition maintaining prominent status (Table 13.1). The 1920 election was pattern-breaking, with two new parties, Labour and the United Farmers of Manitoba (UFM, later renamed the Progressives), emerging as serious contenders without taking power (Figure 13.1). The 1922, 1958, and 1969 elections may be seen clearly as realigning elections: at these times the UFM, the Progressive Conservatives, and the New Democratic Party (NDP), respectively, came out of the political wilderness to change the electoral scene decisively and in lasting ways.

Finally, it is now apparent that 1988 should be interpreted as a deviating election. This election allowed the Liberals to become temporarily the official opposition, but

Table 13.1 Provincial Election Results, 1921–95

Year	Government			Opposition			Premier
	Seats		Popular Vote (%)	Seats		Popular Vote (%)	
1920	Lib	21	36[1]	UFM	12	16	T.C. Norris
				Lab	11	21	
				Con	7	17	
				Oth	4	11	
1922	UFM	28	33	Lib	9	24	J. Bracken
				Con	7	17	
				Lab	6	16	
				Oth	5	10	
1927	Prog	29	33	Con	15	27	
				Lib	7	21	
				Lab	3	10	
				Oth	1	9	
1932	L-P	38	40	Con	10	36	
				Lab	5	17	
				Oth	2	6	
1936	L-P	23	36	Con	16	29	
				CCF	7	12	
				SC	5	9	
				Oth	4	14	
1941	L-P	27	35	Con	2	5	S. Garson, 1943[2]
	Con	13	17	Oth	3	12	
	CCF	3	17				
	SC	2	2				
	Ind	5	12				
1945	L-P	25	33	CCF	10	34	D. Campbell, 1948[2]
	Con	15	18	Oth	2	10	
	SC	2	1				
	Oth	1	3				
1949	L-P	31	40	CCF	7	26	
	Con	10	13	Oth	7	18	
	Oth	2	3				
1953	L-P	35	41	Con	12	21	D. Roblin
				CCF	5	17	
				SC	1	13	
				Oth	4	8	

continued on page 178

they fell back into a more usual distant-third position in the 1990 and 1995 elections.

Federal elections have followed a similar pattern, but one more related to the circumstances in the rest of the country and to Manitoba's position as a "median" province (Table 13.2). Following a period of Liberal/Conservative dominance in the early part of this century, the province returned an overwhelming majority of Progressives in 1921, 1925, and 1926 (except in north Winnipeg, where Labour candidates were elected), only to go back to a more normal Liberal/Conservative distribution of seats after 1930. It underwent a further realigning election in 1957, when the Liberals ceased to be a force, in favour of the Conservatives and the NDP. Finally, it is too soon to tell whether 1993 should be regarded as a deviating or a realigning election.

In all cases of realignment, geographical, ethnic, class, and economic forces combined to break the pattern of support for a particular party or group of parties. We now turn to an explanation of these changes.

THE ROOTS OF CURRENT IDEOLOGICAL IDENTIFICATION: THE PROGRESSIVE ERA, 1922–57

Although support for political parties has shifted over the last seven decades, it is possible to postulate that the current ideological perspectives of the Manitoba voter date back to the period 1915–19, when the province was governed by the Liberals under T.C. Norris. By most accounts, the Liberals were very progressive and were backed by farmers and labour groups.[12]

Great changes occurred, however, following World War I. A recession fuelled large-scale unemployment in Winnipeg, one result of which was that the labour movement conducted a general strike in 1919, demanding better wages and working conditions, as well as collective bargaining rights. The ruthlessness with which the federal government put down the rebellion — aided tacitly by the Liberal government of the province — thrust a wedge between the traditional parties and labour. The latter created the Independent Labour Party, which received 11 seats in the 1920 election. The workers, who resided almost exclusively in north Winnipeg, turned this area for years into one of the most socialist-oriented parts of the country.

The farmers had their own reason

Table 13.1 Continued

Year	Government		Opposition		Premier
	Seats	Popular Vote (%)	Seats	Popular Vote (%)	
1958	Con 26	41	L-P 19	35	
			CCF 11	20	
			Oth 1	4	
1959	Con 36	47	L-P 11	30	D. Roblin
			CCF 10	22	
			Oth -	-	
1962	Con 36	45	L-P 13	36	
			NDP 7	15	
			SC 1	4	
1966	Con 31	40	Lib 14	33	W. Weir, 1967[2]
			NDP 11	23	
			SC 1	4	
1969	NDP 28	38	Con 22	36	E. Schreyer
			Lib 5	24	
			SC 1	1	
			Oth 1	1	
1973	NDP 31	42	Con 21	37	
			Lib 5	19	
			Oth -	3	
1977	Con 33	49	NDP 23	39	S. Lyon
			Lib 1	12	
1981	NDP 34	47	Con 23	44	H. Pawley
			Lib -	7	
			Oth -	2	
1986	NDP 30	41	Con 26	40	
			Lib 1	14	
			Oth -	5	
1988	Con 25	38	Lib 20	35	G. Filmon
			NDP 12	24	
			Oth -	3	
1990	Con 30	42	NDP 20	29	
			Lib 7	28	
			Oth -	1	
1995	Con 31	43	NDP 23	33	
			Lib 3	24	
			Oth -	-	

CCF = Cooperative Commonwealth Federation
Con = Conservative
Ind = Independent
Lab = Independent Labour Party
Lib = Liberal
L-P = Liberal-Progressive
NDP = New Democratic Party
Oth = Other
Prog = Progressive Party
SC = Social Credit
UFM = United Farmers of Manitoba

Notes:
1. Figures for popular vote are rounded to the nearest whole number.
2. Date at which the person became premier if not at the time of the election.

Source: For 1920–90, R. Dyck, *Provincial Politics in Canada*, 2nd ed. (Scarborough, ON: Prentice Hall Canada, 1991).

for turning away from both Liberals and Conservatives. As has been copiously documented, Western farmers in general, and Manitoba's in particular, have had grievances since the early days of agrarian settlement.[13] The unionist Liberal/Conservative coalition in Ottawa was blamed for eliminating the wartime grain marketing system; the postwar recession had brought down the price of wheat, and the federal government appeared reluctant to assist the farmer. Moreover, the provincial Liberals were viewed with suspicion as spendthrift, urban-oriented, and dominated by professionals under Norris.[14]

The dissatisfaction of these two major contradictory forces — farmers and labour groups — was both fateful for the future of politics in the province and deadly to the traditional parties. Particularly after the 1922 election, the UFM became the undisputed political focus of the province. Until its demise in 1963,

Table 13.2 Federal Election Results, 1921–93 (Seat Distribution)

	Liberal		Conservative		Labour/CCF/NDP[1]		Progressive/Other[2]		Total	
	National	MB	National	MB	National	MB	National	MB	National	MB
1921	116	2	50	-	4	1	65/-	12	235	15
1925	99	1	116	7	6	2	24/-	7	245	17
1926	128	11	91	-	6	2	20/-	4	245	17
1930	91	4	137	11	5	2	12/-	-	245	17
1935	173	14	40	1	7	2	-/25	-	245	17
1940	181	15	40	1	8	1	-/16	-	245	17
1945	125	10	67	2	28	5	-/25	-	245	17
1949	193	12	41	1	13	3	-/15	-	262	16
1953	171	8	51	3	23	3	-/20	-	265	14
1957	105	1	112	8	25	5	-/23	-	265	14
1958	49	-	208	14	8	-	-/-	-	265	14
1962	100	1	116	11	19	2	-/30	-	265	14
1963	129	2	95	10	17	2	-/24	-	265	14
1965	131	1	97	10	21	3	-/16	-	265	14
1968	155	5	72	5	21	3	-/16	-	264	13
1972	109	2	107	8	31	3	-/17	-	264	13
1974	141	2	95	9	16	2	-/12	-	264	13
1979	114	2	136	7	26	5	-/6	-	282	14
1980	146	2	103	5	32	7	-/1	-	282	14
1984	40	1	211	9	30	4	-/1	-	282	14
1988	83	5	169	7	43	2	-/-	-	295	14
1993	177	12	2	-	9	1	-/107	1	295	14

Notes:
1. Various Labour parties for 1921–30, CCF for 1935–58, and NDP for 1962–93.
2. The Progressive Party left the national scene after the 1930 election. The vast majority of "Other" includes Social Credit for 1935–65, Créditiste for 1962, and Bloc Québécois (54) and Reform Party (52) in 1993.

Source: Adapted from H.G. Thornburn, ed., *Party Politics in Canada*, 5th ed. (Scarborough, ON: Prentice Hall Canada, 1985), 344 and 349; and author's files for 1988 and 1993 elections.

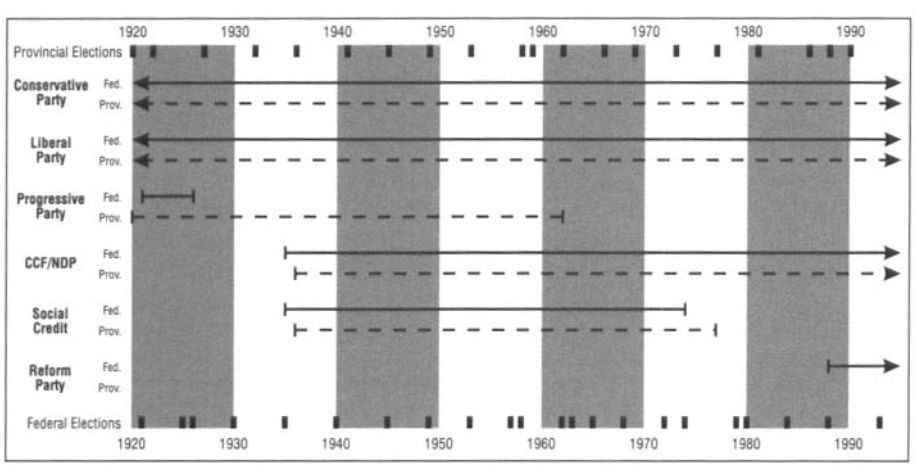

Figure 13.1 Time Lines for Political Parties in Manitoba. This figure establishes the first and, if appropriate, the last time that a major political party ran a candidate in a Manitoba constituency. A vertical bar denotes the first or the last year a party ran a candidate.

Note (1) The Conservative Party began to run candidates under the label Progressive Conservative Party beginning with the federal election of 1949 and the provincial election of 1953. These two parties are not considered separate formations in the political science literature.

Note (2) The Liberal Party of Manitoba merged formally with the Progressive Party in provincial elections between 1932 and 1962, running candidates as the Liberal-Progressive Party of Manitoba. It ran federally under that label in a few constituencies in 1926.

Note (3) The federal Progressive Party ran candidates under that name during the period 1921–26. Provincially, the party's direct predecessor, the United Farmers of Manitoba, ran candidates from 1920 to 1922, under the name Progressive Party in 1927, and as the Liberal-Progressive Party during the period, 1932–62,

Note (4) The New Democratic Pary (NDP) is considered the natural successor of the Cooperative Commonwealth Federation (CCF) in the political science literature.

the party adhered to a philosophy that was deeply conservative socially and noninterventionist economically.[15]

The Progressives' (formerly UFM) strength was concentrated heavily in the rural areas. The farmers saw the party as an extension of their economic organizations and as the beginning of a "new, purer and better civilization."[16] Strongly held together by lofty moral principles, hostility towards both business and labour, a dislike for partisanship, and an obsession with thrifty and careful administration, the Progressives ruled for a period that has been termed both the most stable and the most stagnant in Manitoba's history.

A noted observer labels the government of those 3 decades as "neoclassical Liberal and rentier distributive."[17] It was called "neo-classical Liberal" because the doctrines of public ownership and planning as well as monopoly capitalism were rejected, which translated itself into policies designed to develop agriculture, including creation of publicly

supported credit institutions and the establishment of rural electrification programs, a provincial savings office, a rural telephone system, and public marketing boards.[18] "Rentier distributive" refers to the fact that a businesslike government was established, with a pay-as-you-go philosophy that left Manitoba without any deficits at a time when governments elsewhere were actively involved in the economy during the boom period following World War II. The Progressives maintained a system of taxation based on income, not land, and encouraged private capital to develop industrial resources, offering rewards such as subsidies for railways, loan guarantees, and hydro and timber rights for corporations.[19]

These policies appealed to the richer farmers of the south. As Peterson indicates, this essentially "British group from Ontario . . . comprised a ruling class, although it claimed that class politics was undesirable."[20] The party's strength in rural areas was uncontested — Progressives often won by acclamation — with the exception of two pockets, one north and the other southeast of Winnipeg. In 1936 an economically more radical but socially conservative movement, Social Credit, won five seats in poor non-British districts north of the city. The fortunes of this protest movement were short-lived, however, as it joined the Liberal-Progressive coalition that year. Like the Liberals before, it was absorbed into that government until the party's demise provincially in 1946.

The other contender for the farmers' vote remained the Liberals. Allies with the Progressives in government, they continued to run candidates and win in the Rhineland, the French and German districts of La Vérendrye and Carillon, and the Slavic districts of Springfield, Emerson, and Ethelbert Plains. Except for the Rhineland, where Mennonite farmers had prospered, these areas were relatively poor and had been so since their original settlement.[21] The remaining constituencies outside Winnipeg — except briefly The Pas and Brandon, which voted Co-operative Commonwealth Federation (CCF) in the 1943 by-election — were a sea of support for the Progressives throughout this period.

Winnipeg provided a different picture. The city was handicapped by an electoral system heavily biased in favour of rural areas. In the mid-1930s, despite possessing a population of around 30 percent of the provincial total, the city received only 10 seats out of a total of 55. Electoral maldistribution worsened until 1957, when an independent Electoral Boundaries Commission recommended the current "representation by population" system.[22] The discrimination was exacerbated by a system of proportional representation within city limits, which made it possible for the Liberals and Progressives to gain seats that might have gone to Conservative and CCF candidates under the rules of the plurality system in effect elsewhere in the province.

However, the city never fell to the Progressives because of several factors. First, the deep ideological division between the north and south sides maintained Conservatives and Liberals in a tacit traditional coalition to stop the perceived labour threat both federally and provincially. Second, much of Winnipeg's business community, the largest manufacturing contingent in western Canada, had close connections with similar interests in central Canada and a longstanding affiliation with the Conservatives. Third, although the Progressive Party was for the most part sympathetic to business, its rural-based religious and social conservatism did not appeal to the more sophisticated urban voter.

Thus, while the Conservatives supported the Progressives at least until the mid-1950s, they did not join the coalition until the war broke out, and then only at the call of Premier Bracken, who felt that party disputes during wartime were unpatriotic.[23] By 1950 the business community, "increasingly concerned about the province's slow economic growth and the Campbell administration's evident preoccupation with rural matters,"[24] forced the Conservatives out of the coalition.

North of Portage, Winnipeg consistently returned socialist MLAs, first Independent Labour, CCF after 1933, and Communist on one occasion (the colourful William Kardash, who ran as an Independent Labour Progressive). These parties represented the less affluent members of the community as well as labour, and were led and supported by people of British origin with a strong class identification. For many years North End Jews were the sole non-British ethnic group that supported these parties with any consistency.[25]

Studies have shown that the socialist vote in the Progressive era was class-based, geographically rooted, and to a much lesser extent, ethnic: only when the three corresponded was there a tendency for the ethnic vote to manifest itself. North Winnipeg, therefore, acted as a breeding ground for parties that were clearly anti–status quo. The CCF, in particular, advanced a philosophy that was in direct conflict with that of the Progressives. Although perhaps the two parties shared a deep cultural and social conservatism, the CCF's consistent pronouncements in favour of increased relief, public health, unemployment insurance, public ownership of natural resources and major industries, and increased taxes on the rich were anathema to the Progressives.

An explanation is needed for the failure of socialism in the rural areas of the province. Unlike its Saskatchewan counterpart, the Manitoba CCF and its successor, the NDP, were never agrarian movements. In this respect, they resemble more the British Columbia parties. Their failure, particularly in the south, was due not only to the relative wealth of the land and its occupants but also to the fact that the vast majority of these people were Anglo-Saxons from rural Ontario, where a deep-seated social and economic conservatism was prevalent.[26] The major farm organization, the Manitoba Federation of Agriculture and Co-operatives (MFAC) was Liberal-dominated. Efforts by the CCF to offer agricultural programs, with the promise of introducing marketing boards, crop and flood insurance, and farm security, were to no avail.

South of the 50th parallel, the CCF and the NDP never came close to gaining a seat in the provincial legislature. Only in Brandon, certainly not a rural centre, was the CCF able to break through, and then only for two years. However, the NDP has held the largely working-class Brandon East seat since its creation in 1969.

The CCF was somewhat more successful north of 50. In these areas, poorer lands and mining endeavours, combined with a more diverse population of European settlers (primarily Ukrainian, German, and Icelandic), made the party more appealing. The party took Brokenhead, The Pas, Fisher, Gimli, and Ethelbert at various elections in the 1940s and 1950s.

Interestingly, when the radical Manitoba Farmers' Union (MFU) was created in 1950, it was perceived as a potential source of support and votes for the CCF, but the MFU officially remained outside politics. Its leaders consistently attempted to broaden the movement's basis of support without alienating its more conservative members. In fact, Wiseman indicates that when the Liberal-Progressive stranglehold was loosened, farmers from within the organization opted generally for Diefenbaker populism rather than socialism.[27]

THE CONSERVATIVE REVIVAL: THE ROBLIN-DIEFENBAKER BREAKTHROUGH, 1957–69

Much of the political map changed in 1957, swiftly in federal politics, a little less so provincially. The western populism advocated by John Diefenbaker struck a chord in Manitoba. His belief in a single Canadian identity appealed both to newcomers who wished to become a part of the society and to the southern farmers who were becoming increasingly concerned with ethnicity and perceived Liberal favouritism towards French Canadians.

Diefenbaker's vision of equality of opportunity for all was equally attractive to many Manitobans, who feared an eastern-dominated economy and society. In addition, the Conservatives provided the sole national alternative to the weary Liberals, who had dominated the national scene, with a brief Conservative interlude (1930–35), since 1922. Finally, Diefenbaker's social conservatism suited well the ideology propagated by the Progressives and to a large extent the provincial Liberals. In fact, it could be stated that by voting for Diefenbaker's Conservatives, the Manitoba voter was not making a major shift in allegiance away from the Liberal-Progressive ideology.

The Diefenbaker victory in the 1958 federal election precipitated a gradual yet decisive shift in the electoral politics of the province. First, south Winnipeg and northern Manitoba, and then, when the Progressives left politics in 1962, all of southern Manitoba became Conservative territory. The Liberals managed to retain only some seats east and south of the city, where their strength had been traditionally more durable, while the CCF, followed by the NDP, continued to dominate north Winnipeg.

Besides the coat-tail effect produced by Diefenbaker, several reasons can be advanced to explain the provincial Tory breakthrough. The Manitoba economy, which had declined relative to those of other Prairie provinces, was beset with economic difficulties.

Poor economic growth had produced a social crisis. The province was beginning to lose population and was plagued by regional economic disparities. A post-war rationalization of agriculture was reducing labour requirements and helping to foster a process of urbanization. But the relative decline of Winnipeg and general slow economic growth meant that migrants could not remain in the province. The limited role of government so closely associated with the Liberal-Progressives soon came to be seen as part of the problem, preventing as it did novel initiatives to address economic problems.[28]

The Conservative period under Premier Duff Roblin is associated with economic, social, and political revitalization. The state became an active partner in economic change, with numerous initiatives in public works, hydro development, and mining. The government made efforts to attract business through financial incentives (such as the establishment of the Manitoba Development Fund), and made a shift in fiscal policy by spending in deficit mode in order to provide the infrastructure required for economic growth. Provincial expenditures on health, welfare, and education also increased substantially.

Metro Winnipeg — the forerunner of Unicity — was created in 1961, schools were consolidated and new ones built, and the Urban Renewal Corporation was established. Emphasis turned from a rural, agricultural outlook to urban manufacturing, large-scale resource industrialization, and social services. Winnipeg regained the coveted position it had lost during the Progressive era, and as the sole truly urban centre in the province, quickly and effectively became the political centre as well. In effect, the wealthy urban-rural coalition of the Progressive era continued, but now under urban business domination.

The Roblin period has been referred to as a transitional one, containing both conservative and reform elements.[29] It produced a regeneration in the political process. Clearly, economic growth caused a reemergence of class politics in the province, following a long lull during which governments simply administered the affairs of the state, claiming to be above class and above politics. The new focus on economic growth during the 1960s made possible the delineation of a new economic reality that would adversely affect some sections of the population, particularly when recession set in. While Roblin's progressive hand kept these forces at bay during a time of take-off, his successor, Walter Weir, turned clearly to the right when faced with fiscal pressures, introducing a sales tax and cutting government expenditures in an effort to contain the deficit. Under Weir's leadership, Manitoba became the last province to join medicare; this hesitation caused numerous protests and demonstrations by labour, professionals, and other groups.

THE EMERGENCE OF THE NDP: SOLIDIFYING GEOGRAPHICAL PATTERNS OF IDENTIFICATION, 1969–88

Although it is at least arguable that the NDP victory in 1969 was inevitable, several factors can be suggested to explain it, first and foremost of which was the coincidence of geographical and ethnic cleavages. Two examples may help to make this point.

Following a report that living conditions in northern Manitoba were among the worst in Canada,[30] the Conservative MLA for Churchill resigned from the legislature complaining of the government's indifference to this region. The Indian and Métis population was in economic decline, with high rates of infant mortality, malnutrition, tuberculosis, and unemployment. Many had moved to Winnipeg, only to find conditions worse. The Weir government had refused requests for housing assistance, partly due to the state of finances and partly because of insensitivity to the plight of the people. The Aboriginal population had been disenfranchised until 1952, but it is known that, to the extent that they voted, they normally supported the Liberals or Conservatives depending on whether they were Catholic or Protestant. In 1969 this vote went largely to the NDP, which promised greater equality and understanding.

The French Canadian minority, concentrated in east Winnipeg and its rural vicinity, was also upset with the Weir government. Unlike Roblin, who had introduced cultural policies beneficial to this community — such as French instruction in predominantly French districts and the use of public schools for the teaching of French — Weir advocated no special status for this minority or for Quebec. Although the group voted Liberal in 1969, one of that party's elected MLAs, Larry Desjardins, representing St. Boniface, joined the New Democrats after the election, thereby ensuring continued support for the NDP by much of the French community.

The NDP replaced the Liberals as the party favoured by ethnocultural groups. As an observer of the party suggests, the Liberals had failed to take a centre, let alone a centre-left, position in the political spectrum. Now they were competing for the same vote as the Conservatives, thereby "refusing to perform the proper function of a left party by ignoring the claims of the rural poor and the urban working class. Yet they could hardly hope to replace the Conservatives, for they had not established a following, evidently, among the urban middle class."[31] Their leader, Robert Bend, a deeply conservative politician linked to the Progressive era, offered a platform little different from that of the Tories. The many years of coalition with the Progressives hampered the party's ability to change with the times.

Moreover, the political mood was changing. Expansion in the economy was reflected in a more progressive outlook on social and economic policy geared towards softening the impact of modernization on the less well-off. In addition, the NDP, previously associated with the old "British" working class, was changing. It had become a more ethnically mixed party in both membership and leadership. Ed Schreyer, the new leader, was young, of German origin, Catholic, and a university professor who had grown up in a Ukrainian district — hardly the epitome of the previous CCF/NDP leadership!

There are seemingly conflicting theories about the marriage of ethnicity and class in the election of 1969. While Peterson asserts that the NDP victory was "made possible by a decline in ethnic consciousness,"[32] meaning that traditional ethnic appeals were now less effective, others have argued that "1969 can be seen as a sudden realization of other-ethnic (i.e., non-British) class consciousness."[33] Both assertions have value in that class-based and geographically oriented ethnicity became entangled; where they corresponded, the NDP made great strides.

The 1969 election helped establish a new, clearer, polarized party system in Manitoba: on the one hand, Conservatives, supported by southern farmers — the former Progressives — and members of the business community in south Winnipeg; on the other, the NDP, receiving support from the North, ethnic groups, labour, civil servants, salaried professionals, and poorer central-rural farmers. This pattern persisted with slight changes until 1988.

Between 1969 and 1988, these two forces held sway over both the federal and provincial electoral maps. Aside from one term in office by the Conservatives under the radically neoconservative Sterling Lyon in 1977–81, the NDP dominated the province, whereas the Conservatives held a majority of federal seats. In essence, the federal scene reflected the geographical divisions alluded to earlier, with the south of the province and of Winnipeg voting Conservative; the North and north Winnipeg voting NDP; and the rest of the province alternating between Conservative and NDP, depending on the national mood and trends during particular elections.

Interestingly, the sprawling Churchill constituency did not go federally for the NDP until 1979, 10 years after the party won the area provincially. The Conservative domination can be variously explained by the lasting effects of the Diefenbaker sweep of 1957, the Roblin efforts to develop the area economically, and the power of the sitting MP, Robert Simpson, who held the riding for 15 years.

In provincial elections, Liberal support dwindled from five seats and 24 percent support in 1969 to a low of zero seats and 7 percent support in 1981 (Table 13.1). The Liberal decline helped solidify Manitoba as a two-party province. Two-party systems are usually found either in societies with polarized political cultures, as in the case of advanced industrialized systems of a unitary (i.e., nonfederal) nature, such as Britain, British Columbia, or Quebec; in economically less-developed systems; or in federal systems where parties that are ideologically similar alternate in power (such as in the Atlantic provinces and Canada itself).[34]

With the exception of the "deviating" Lyon regime of 1977–81, Manitoba belonged in the "economically less-developed" category during the 1969–88 period. Although some observers have claimed that the provincial NDP never approximated the principles of socialism or even social democracy,[35] the fact is that the NDP was perceived as the party of change, of the underclass, of social and economic equity, and of progressivism. However, the party had to contend with periods of national recession in 1973–77 and in 1986–88, which put a quick end to its Keynesian model of economic development.

The Conservatives, on the other hand, particularly under the premiership of Lyon, were clearly on the ideological right in fiscal, social, and constitutional matters, greatly resembling the Progressives of earlier years.[36] Their policy of "acute, protracted restraint" was meant to favour business growth and development through megaprojects and reduced government expenditures. It hurt tenants, especially in cities, the lower middle class, and small business people. It was largely a coalition of these urban groups that helped put the NDP back in power in 1981.

Howard Pawley, NDP premier between 1981 and 1988, moved cautiously towards reestablishing a policy of public entrepreneurship and full employment, ideological themes diametrically opposed to those of the neoconservative Lyon government. As one prominent political economist noted, "the NDP implemented a traditional social democratic economic strategy, but under conditions that produced a fiscal drain in the public treasury. In other words, it slipped into the crisis of social democracy."[37] The party's defeat in 1988 brought about a potential realignment in Manitoba.

THE STALLED LIBERAL RESURGENCE: FEDERAL AND PROVINCIAL PERSPECTIVES, 1988–95

For the fourth time in this century, the province appeared ripe for a pattern-breaking election. Gary Filmon, elected Conservative leader in 1984, advocated a centrist position but was under attack from his party's still-influential right wing. The NDP appeared unable to reorient itself ideologically and strategically and had changed leaders during the election campaign, selecting Gary Doer, former president of the Manitoba Government Employees' Association (MGEA).

In the meantime, Sharon Carstairs, who had become Liberal leader in 1984, had succeeded in turning her party away from its traditional conservative, rural roots, and towards an urban-oriented, reformist, and centrist alternative to the polarization recently experienced in the province. Her vocal and principled opposition to the Meech Lake Accord and to the North American Free Trade Agreement, to the notion of politics as usual, and to both fiscal ultraconservatism and interventionism, attracted many new supporters. The federal Liberals were no longer perceived as Trudeau's and Quebec's party. Lloyd Axworthy, the powerful and popular MP for Winnipeg Fort Garry, had helped expand the Liberal base in traditional Conservative and NDP territory.

This urban image, as well as careful policy development, helped propel the party to official opposition status and to holders of the balance of power in a minority legislature following the 1988 election. The Liberals made an outstanding breakthrough in all of Winnipeg, capturing 19 out of 29 seats in the city. Significantly, these seats were obtained in a cross section of Winnipeg, including upper-middle-class, lower-middle-class, and ethnic areas, and even working-class districts such as Transcona, Osborne, Ellice, and River Heights (Figure 13.2). It even managed to gain a seat in Selkirk, a former NDP riding north of Winnipeg.

Optimism about the provincial revival of this erstwhile powerful political force was short-lived, however. In the 1990 election the Liberal Party found itself once more in third place, losing 13 of its seats. Although this might suggest that 1988 was a deviating election, there is sufficient reason to believe that the Liberals had an opportunity to transform the provincial political scene. Clearly the party suffered from severe immaturity in 1988. It was ineffective in the legislature, particularly after it abandoned its stand on Meech Lake. Not only did it lose a magnificent opportunity to benefit from an increasingly unpopular accord, but Carstairs suffered from an image of vacillation and weakness. Eventually, by her own admission, Meech Lake led her to resign as leader.[38] Although the party has given a lacklustre performance in the legislature since 1990, its new leader, Paul Edwards, selected in 1993, has sought to position the Liberals as a distinct centrist alternative and to broaden their base of support.

The 1993 federal election helped the cause of the Liberal Party considerably. For the first time since the early 1950s, it seized all but one of Winnipeg's ridings and made enormous gains in rural and northern Manitoba, gaining seats in its former domains of Provencher, Portage-Interlake, and Brandon-Souris (Figure 13.3). Although one should be careful not to extrapolate federal results into provincial strength, the fact is that two decades of geographical, class, and ethnic divisions in Manitoba appeared to have been shattered in 1993. Indeed, the current federal political map of the province suggests a centrist society rather than the highly polarized scene of the past. By and large, only the farmers of the wealthy south retained their deep ideological conservatism, opting in this election for the Reform alternative.

The provincial Liberal Party was unable to sustain the impetus generated by its federal counterpart in 1993. The April 1995 provincial election saw the reestablishment of the 26-year-old two-party system, neatly articulated along geographical, class, and ethnic lines (Figure 13.4). The irony is that this occurred at the end of a campaign characterized by the absence of major policy divisions among the three parties.

The Liberals failed to impress voters: a lacklustre, unfocused campaign caused them to slip from a strong second place in the early

polls to a distant third by election day. The restoration of the north-south provincial party alignment, both in Winnipeg and in Manitoba as a whole, may be attributed both to the collapse of the Liberal campaign and to the strong, focused campaign staged by both the NDP and the Conservatives. The assertion of a well-known Winnipeg columnist[39] that the election outcome heralded the reappearance of the "politics of class" caused by the "widening social rift" experienced in Manitoba may be correct. Given the relatively centrist nature of all parties' platforms, however, it was the voters' images of the traditional alternatives and their comfort with those choices — rather than ideological distinctiveness as in previous decades — that once again brought together geography and politics in the province.

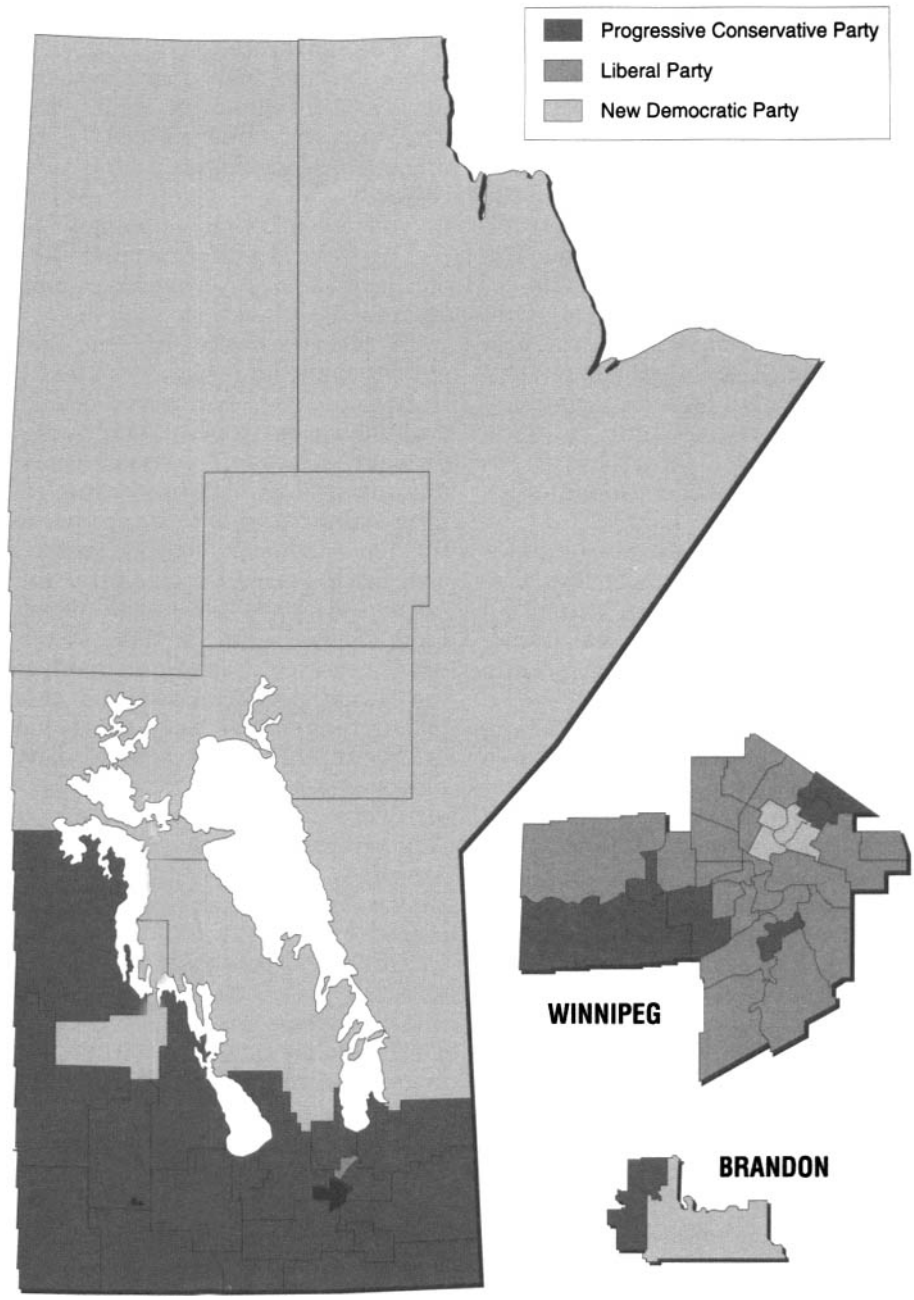

Figure 13.2 Results of the 1988 Provincial Election

CONCLUSION

This chapter has argued that regionalism has played an important role in Manitoba electoral politics. In a province geographically diverse by virtue of a variety of physical and social factors, an early relationship was established between location and party identification, or rather ideological perspective, which manifested itself in party affiliation. For example, the rich lands of the south were settled first by Ontario Anglo-Saxons and later by Mennonites. Deeply conservative socially and economically, but affiliated with the Liberal Party since the early years of Confederation, their ideology led them to accept any new political party that held values similar to their own — Progressives, Conservatives, and then Reform.

For their part, the French Canadian, Icelandic, Ukrainian, and other settlers of less valuable land to the east and north of Winnipeg were more likely, because of their economic vulnerability, to vote for the government of the day. For a long time these governments were of the same stripe federally and provincially, so the Liberals generally received their vote. However, these settlers were more likely to shift their ideological focus to the left if and when necessary, not so much out of socialist tendencies as in support of any party with a good chance of forming a government that would give them an opportunity to progress economically. Although there is insufficient data to prove the point, the 1993 federal election suggests that while the farmers in the districts with better soils north of the 50th parallel voted Reform, the less affluent growers had no difficulty turning to the Liberal Party.[40]

Long the domain of the Liberal-Progressive coalition, the North turned Conservative during the Roblin-Diefenbaker era. As economic development and unionization arrived in the area, accompanied by Aboriginal consciousness, it became dominated by the NDP. The fact that this region has now returned a Liberal to Ottawa indicates that economic development and greater opportunities for establishing Native self-government, rather than ideological purity, dominate the politics of the area.

Until recently, Winnipeg has of-

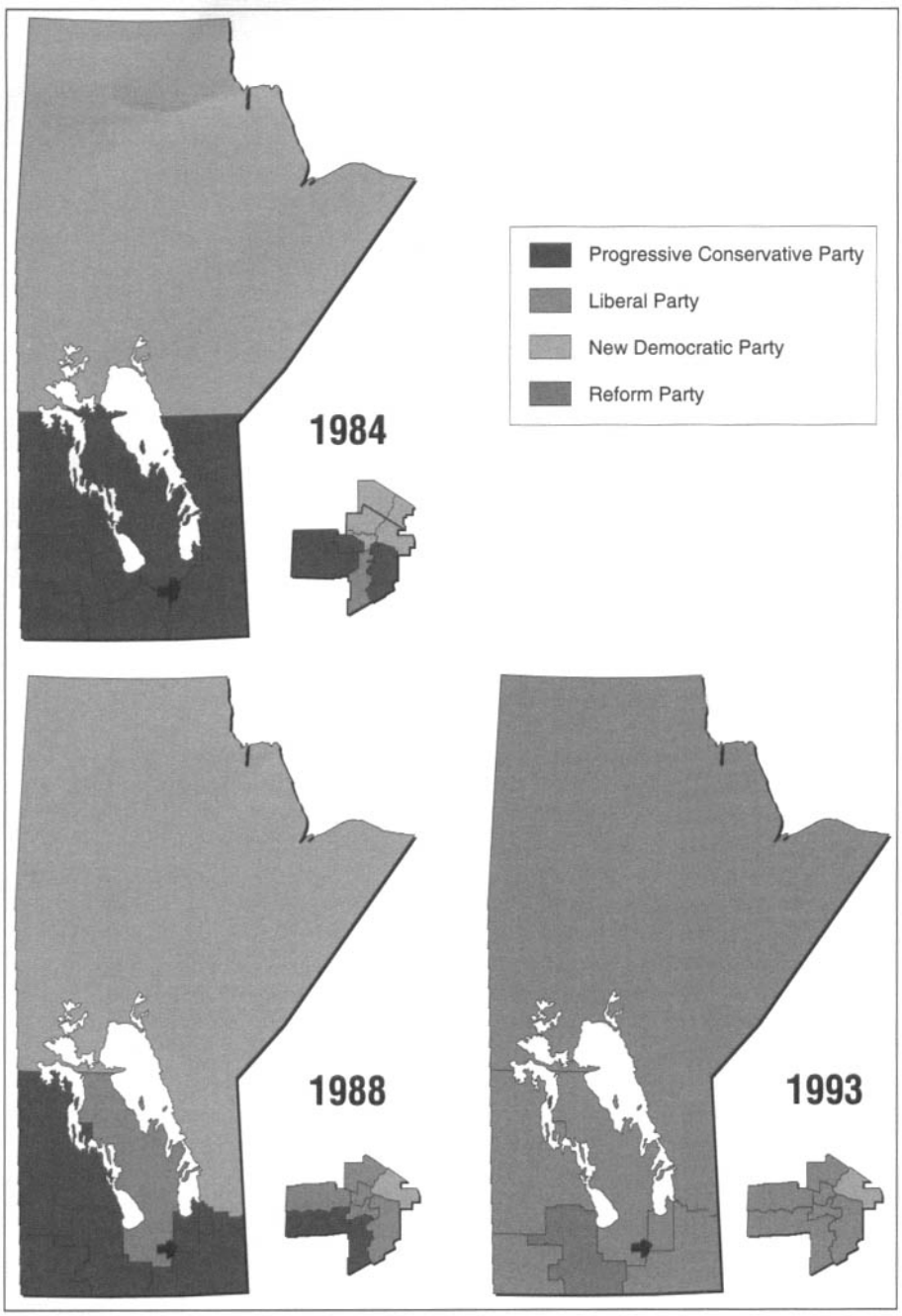

Figure 13.3 Results of the 1984, 1988, and 1993 Federal Elections

fered a striking contrast to this pattern. Since the early 1920s, the city has been essentially divided into two camps, ideologically distinct on the basis of class and neighbourhood.[41] The North End was particularly stable until the late 1980s; only Diefenbaker in 1958 was able to loosen the socialist stranglehold. Federally, Winnipeg South and its successor ridings were alternately Liberal and Conservative, ideologically right but not totally the domain of any one party. Until 1993 the Tories tended to hold the wings, while the Liberals held the centre along Pembina Highway. This general pattern repeated itself provincially, although the Conservatives tended to expand their support at the expense of the Liberals after 1958.

The political map changed considerably throughout the province in 1993. We may conclude that the traditional marriage of geography, ethnicity, and class may be coming to an end at the federal level, with the Liberal Party once again cutting across those lines as they did so successfully during the 1927–58 coalition with the Progressives. The convergence of geography and party loyalties at the provincial level, however, remains as profound as ever.

ACKNOWLEDGEMENTS

The author would like to thank Dr. Jim Naylor and Tom Mitchell of Brandon University for comments made on earlier drafts.

NOTES

1. Political culture is a popular political science concept. H.S. Albinski and L.K. Pettit define it as "the character and distribution within a society of attitudes toward the political system . . . [and] the patterns of social, educational and occupational experience of a people, along with aspects of their political history," in *European Political Processes,* 2nd ed. (Boston: Allyn and Bacon, 1974), 1.
2. The literature on political regionalism in Canada is voluminous. For good reviews, see R. Simeon and I. Robinson, *State, Society and the Development of Canadian Federalism* (Toronto: University of Toronto Press, 1990), and D.J.C. Bell, *The Roots of Disunity: A Study of Canadian Political Culture,* rev. ed. (Toronto: Oxford University Press, 1992), ch. 5.
3. R. Gibbins, *Regionalism: Territorial Politics in Canada and the U.S.* (Toronto: Butterworths, 1982), and M. Serfaty, "Political Regionalism and Separatism in Western Canada: the Myth and the Reality" (Paper presented to Asociación Mexicana de Estudios Internacionales, Acapulco, March 1993).
4. R.H. MacDermid, "Regionalism in Ontario," in *Canadian Politics,* ed. A.G. Gagnon and J. Bickerton (Peterborough, ON: Broadview Press, 1990), 360.
5. See, for example, D.J. Elkins and R. Simeon, *Small Worlds: Provinces and Parties in Canadian Political Life* (Toronto: Methuen, 1980), ch. 2; and R. Dyck, *Provincial Politics in Canada,* 2nd ed. (Scarborough, ON: Prentice Hall Canada, 1991), 339ff. The latter provides a particularly good overview.
6. Figures derived from Statistics Canada, 1991 Census of Canada.
7. See Elkins and Simeon, *Small Worlds,* chs. 1–3.
8. D.E. Smith, "The Prairie Provinces," in *The Provincial Political Systems,* ed. D.J. Bellamy et al. (Toronto: Methuen, 1976), 52.
9. For an examination of Brandon's political culture, see L.Y. Liu and M. Serfaty, "Regional Perception in a

Small Prairie City: The Case of Brandon, Manitoba," *Prairie Forum* 9(Spring 1984):119–31.

10. V.O. Key, "Theory of Critical Elections," *Journal of Politics* 17(February 1955):3–18.
11. It is important to note that we are generalizing here about the rise and fall of political parties. Although percentage of votes obtained is important, political scientists normally attribute greater significance to the number of seats obtained in determining the strength of parties. See Figure 13.1 for actual dates of emergence and demise of political formations in Manitoba.
12. M.S. Donnelly, *The Government of Manitoba* (Toronto: University of Toronto Press, 1963), 59.
13. J. Jackson, *The Centennial History of Manitoba* (Toronto: McClelland and Stewart, 1970), 195. By far the best study of the Progressive Party is W.L. Morton, *The Progressive Party in Canada* (Toronto: University of Toronto Press, 1950).
14. E. Whitcomb, *A Short History of Manitoba* (Stittsville, ON: Canada Wings, 1982), 40.
15. It is a matter of debate whether the Liberals or Progressives were the senior partner in the coalition. Some authors, such as Wilson, believe that the Liberals were the leading force; some, like Donnelly, credit the Progressives with this role. See J. Wilson, "The Decline of the Liberal Party in Manitoba Politics," *Journal of Canadian Studies* 10(Winter 1975):26; Donnelly, *The Government of Manitoba,* 56–67.
16. Donnelly, *The Government of Manitoba,* 63.
17. A. Netherton, "Manitoba," in *The Provincial State,* ed. K. Brownsey and M. Howlett (Toronto: Copp, Clark, Pitman, 1992), 178.
18. R.M. Pearson, *Provincial Finance in Manitoba* (Winnipeg: Economic Survey Board, 1938), 16.
19. Netherton, "Manitoba," 179.
20. T. Peterson, "Ethnic and Class Politics in Manitoba," in *Canadian Provincial Politics,* ed. M. Robin (Scarborough, ON: Prentice Hall Canada, 1972), 87.
21. Peterson, "Ethnic and Class Politics," 98.
22. Donnelly, *The Government of Manitoba,* 60.
23. In fact, even the CCF joined this coalition during 1941–43.
24. Peterson, "Ethnic and Class Politics," 98.
25. Ibid., 94.
26. N. Wiseman, *Social Democracy in Manitoba: A History of the CCF-NDP* (Winnipeg: University of Manitoba Press, 1983), 82.
27. Ibid., 85.
28. Netherton, "Manitoba," 180–1.
29. Peterson, "Ethnic and Class Politics," 99.

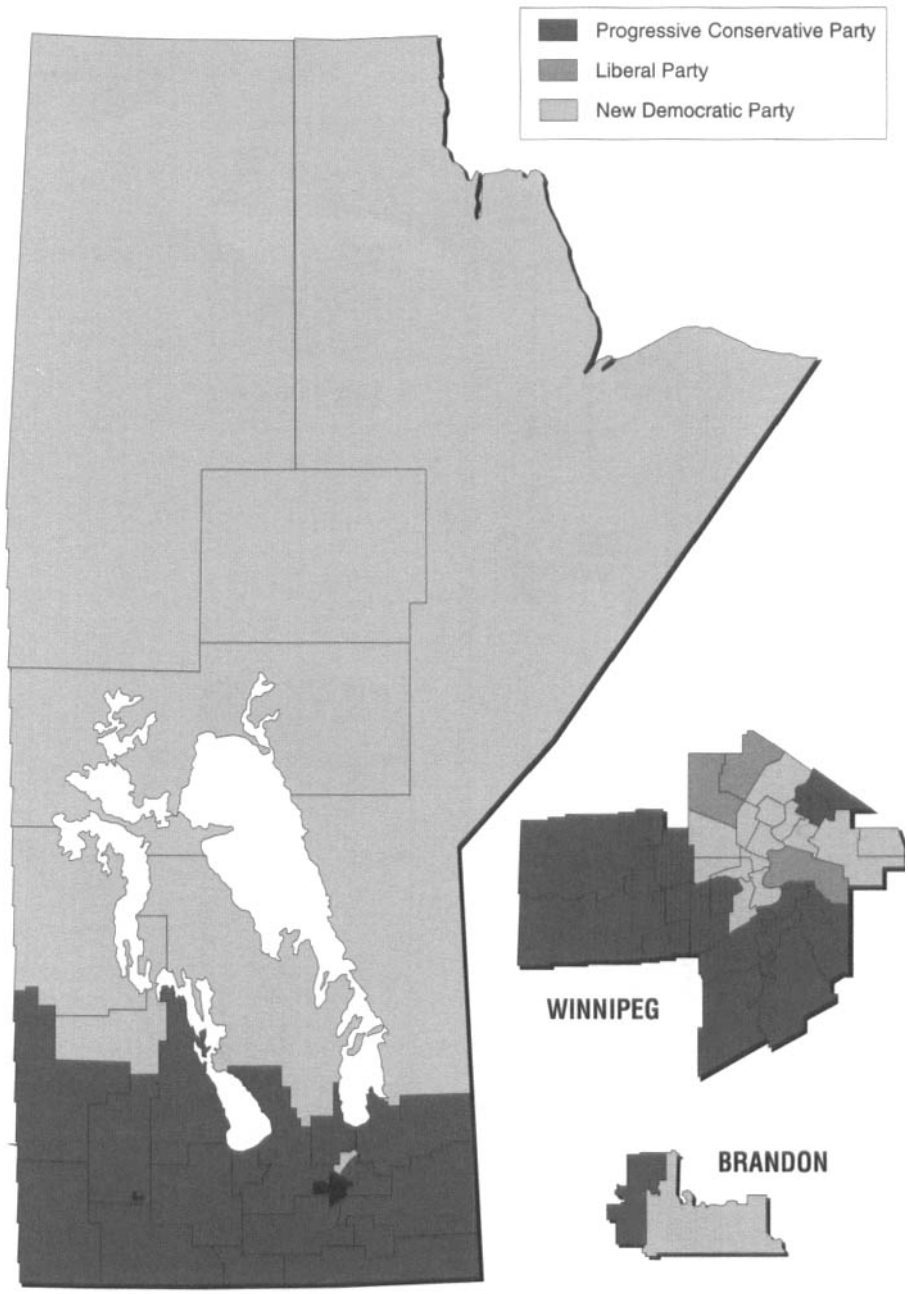

Figure 13.4 Results of the 1995 Provincial Election

30. Quoted in ibid., 105.
31. Wilson, "The Decline of the Liberal Party," 30.
32. Peterson, "Ethnic and Class Politics," 110.
33. Dyck, *Provincial Politics,* 391.
34. See, for example, G. Smith, *Politics in Western Europe,* 4th ed. (Aldershot, UK: Gower, 1986), 81.
35. J. McAlister, *The Government of Ed Schreyer* (Montreal: McGill-Queen's University Press, 1984).
36. Dyck, *Provincial Politics,* 396–8.
37. Netherton, "Manitoba," 195.
38. S. Carstairs, *Not One of the Boys* (Toronto: Macmillan of Canada, 1993).
39. F. Russell, "Politics of Class Played Here," *Winnipeg Free Press,* 19 April 1995, B3.
40. The nature and extent of party voting may be partly gleaned by comparing poll-by-poll results in these areas. This is particularly feasible for provincial elections. See Government of Canada and Government of Manitoba Electoral Commission reports of election results for particular years.
41. The concept of neighbourhoods and their impact on voting behaviour, including Winnipeg, is explored by J. O'Loughlin, "The Neighbourhood Effect on Urban Voting Surfaces: A Cross-National Analysis," in *Political Studies from Spatial Perspectives,* ed. A.D. Burnett and P.J. Taylor (Chichester, England: John Wiley, 1981), 357–88.

Case Study 13.1
The Brandon-Souris Riding
Lee Clark

The widespread success enjoyed by the Manitoba Liberals in the federal election of 25 October 1993, as they captured 12 of Manitoba's 14 ridings, made Glen McKinnon's win in Brandon-Souris initially seem less remarkable, even though this was the federal party's first victory in this constituency in 54 years. In fact, by virtue of his election, McKinnon joined a small group of four non-Brandonites who have had the privilege of representing the constituency of Brandon or Brandon-Souris, as the riding became known after its amalgamation with the federal riding of Souris in 1953 (Figure 13.1.1).[1]

Moreover, two of the four, J.A.M. Aikins and Thomas A. Crerar, were actually nonresidents whose national parties had "parachuted" them into this riding. Aikins, a Winnipeg Conservative and a CPR solicitor, was elected in 1911 due in large part to the active support of the former Minister of the Interior and retiring Liberal MP for Brandon, the Honourable Clifford Sifton, who vehemently opposed Prime Minister Laurier's proposed Reciprocity Agreement with the United States.[2]

Crerar, the former national leader of the Progressives, was invited in 1929 to return to politics as Mackenzie King's Minister of Railways and Canals, and served briefly as the MP for Brandon following the decision of both the Conservatives and Labour to by-pass the by-election in favour of "preserving their ammunition" for the 1930 general election. Just months later, and exactly as he had predicted,[3] the outsider Crerar was decisively defeated in that national election by a local candidate, D.W. Beaubier, a Brandon Conservative.

Thus only two rural residents of the riding, Glen McKinnon included, have ever been elected to represent it throughout its history. The first was Robert Forke, a farmer and long-serving reeve of the rural municipality of Pipestone, who was elected initially as a Progressive in 1921. Following his reelections in 1925[4] (when local Liberals helpfully decided not to field a candidate) and 1926 (when Forke was officially nominated by both the Liberals and the Progressives),[5] the Brandon MP was elevated to the Senate as a Liberal in 1929.[6]

Perhaps a closer examination of the national and local circumstances surrounding the federal elections of 1921 and 1993 will help explain the extremely rare and thus interesting success of Robert Forke of Pipestone and Glen McKinnon of Virden.

There are a number of noteworthy general similarities between the two national elections. The Conservatives (or the Progressive Conservatives, as they were known after 1942) were the governing, and thus accountable, party in each case. The unpopularity of both these governments had reached a peak or near-peak at the worst possible time — on the eve of a general election. Moreover, the government — or the governing (Progressive) Conservative Party, to be more correct — elected new leaders in each instance just before the election, in an obvious but futile attempt to satisfy those who were thirsting for change. Finally, the results were certainly similar in that the (Progressive) Conservative government in each election was soundly defeated nationally, as were their candidates in Brandon(-Souris).

Led by Robert Borden, the then highly protectionist Conservative Party had come to power in 1911, capitalizing in part on a fairly widespread nationalist reaction to Laurier's proposed Reciprocity Agreement with the United States. Within three years, Canada would be at war, and soon a combination of allegations of widespread profiteering, a sharp increase in the cost of living, the Ross rifle scandal, the conscription crisis, and an overall war-weariness began to take its political toll.

Although the war itself ended at long last on 11 November 1918, the country's economic, and thus the government's political, woes continued almost unabated. The combination of postwar unemployment, the 1919 general strike, high tariffs, and the collapse in agricultural prices led

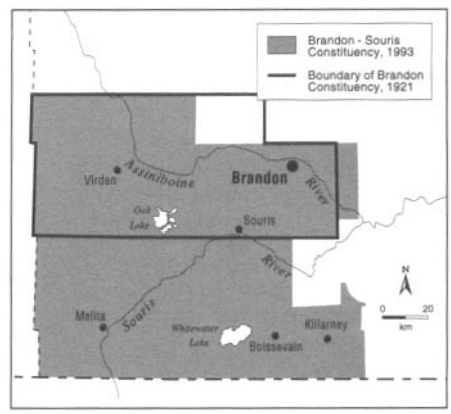

Figure 13.1.1 Location of the Former Brandon and the Present Brandon-Souris Federal Ridings

to the alienation of vast segments of the Canadian public. Despite the emergence in 1920 of a new Conservative leader, and thus new prime minister, in the person of Portage la Prairie's Arthur Meighen, it was evident that the Canadian public's demand for change had not been satisfied as the 1921 general election loomed.

Before the Great War, the voters' rejection of one of the old-line parties had automatically meant its replacement with the other. By war's end, however, that political maxim was no longer true. Disenchanted with both old-style politics and old-line parties, western Canadians in large numbers began turning to the new but essentially conservative "farmer movement," which virtuously and repeatedly claimed (as would the Reform Party 72 years later)[7] that they were not a political party as such! In 1920 the newly formed United Farmers of Manitoba won a surprising 12 of 55 seats. By 1921 the farmers, who continued to insist that they were not politicians, had made significant gains in a number of provincial elections. The winds of change were blowing strongly in agrarian Canada.

Despite the Manitoba Liberal organization's determination to nominate an official Liberal candidate in every constituency in 1921, most local Liberals had other interests. Disenchanted with Mackenzie King's opposition to conscription, his close affinity for Quebec, and his support for high tariffs, Brandon and area Liberals turned almost en masse to

the Progressives. Robert Forke — farmer, rural resident, long-serving reeve of the rural municipality of Pipestone, and, not coincidentally, a former Liberal — thus automatically became a front-runner.

Under these circumstances, Brandon Conservatives had little choice but to nominate a farmer candidate of their own — C.E. Ivens, a well-known Virden-area farmer whose credentials on paper were as good as those of the Progressive candidate.

Because of the strength of the farmer movement, the qualifications of the individual candidates were probably of little consequence in Brandon in 1921. Robert Forke took 9,596 votes and easily swept both country and urban polls, receiving 68.3 percent of the total vote.[8] Ivens (who may have taken comfort in the fact that every Conservative candidate in the Prairies went down to defeat) was a distant second with 4,067 votes. As for F.C. Cox, his token 404 votes was evidence of the fact that the sole purpose of his candidacy was to ensure an official Liberal presence in this contest.

Following their 1984 election victory, Brian Mulroney's Progressive Conservatives were very mindful of the fact that they had had extremely few opportunities to govern in the last half century; they were determined, therefore, to make their mark on history. Forgetting the extent to which change is disruptive, the new government inundated Canadians with legislative and administrative proposals.

Faced with a series of deficit-reduction measures that unfortunately coincided with the aftermath of a severe recession; bitterly frustrated with the government's seeming refusal to listen and to respond to the public's anger over the highly visible and much-hated Goods and Services Tax (GST); frightened, even if unduly, by the proposed Free Trade Agreement with the United States;[9] and driven to despair by the government's seemingly unending preoccupation with constitutional reform, Canadians began to talk about the "most-hated government and the most-hated prime minister in Canadian history" well in advance of polling day 1993.

Those who may have hoped naively that the replacement of Mulroney with Kim Campbell would do for the Conservatives at least in part what Trudeau's succession to the leadership had done for the Liberals would be bitterly disappointed. Although Campbell's surprisingly ineffective election campaign only aided and abetted the ensuing debacle, the overwhelming defeat of the Progressive Conservative government may well have been inevitable, even though only a handful of insiders foresaw the possibility of the party's virtual eradication from the House of Commons.

Whereas the political necessity of nominating farmer candidates had been self-evident in 1921, there did not seem to be any compelling reason to select rural standard-bearers in 1993. Although the Reform Party (which was very similar in philosophy and appeal to the farmers/Progressives) was presumed to have its greatest potential in the rural area, Brandonites now constituted approximately 57 percent of the total vote within the constituency, and thus were the dominant force.

Virdenite Glen McKinnon, who emerged as the Liberal standard-bearer, was the best known of those seeking the nomination because of his role as mayor of the constituency's second-largest community and his previously unsuccessful candidacy in the 1990 provincial election. Regardless of his domicile, which seemingly was not a factor in his selection, he was perceived as a solid candidate who would represent the party well in a campaign that few initially expected him to win.

Certainly rural support had contributed significantly to recent Progressive Conservative successes in Brandon-Souris, including the relatively tough "free-trade" election of 1988.[10] In fact, the rural Prairie vote had been predominantly Conservative ever since the Honourable Alvin Hamilton's highly activist term as Minister of Agriculture (1960–63) during the Diefenbaker government. Although the public distaste for Prime Minister Mulroney was expressed most openly in rural western Canada, his government's agricultural record was probably its most highly regarded achievement, and some believed that a rural candidate would be better positioned to capitalize on this.

Faced with a difficult choice between two exceptionally well-qualified nominees, and perhaps weary of the constant flow of Brandon residents seeking the right to represent them in Ottawa, rural Conservatives (with some significant urban support) nominated one of their own in 1993. Larry Maguire, a successful Elgin-area farmer and farm leader, triumphed over the Honourable Jim McCrae, a popular Brandon resident and highly regarded provincial Minister of Justice. Brandon and area electors would have their first opportunity to vote for a rural Conservative standard-bearer since J.W. Thompson of Elkhorn ran unsuccessfully in 1940.

Although candidate Glen McKinnon and local Liberals were naturally delighted with their 12,130 votes and the resulting victory, the explanation for their first success in Brandon(-Souris) in 43 years clearly did not lie in a new-found popularity. In fact, McKinnon had received only 726 more votes than the Liberal candidate had polled in 1988, when Dave Campbell's 11,404 votes were sufficient only for a distant (by nearly 6,000 votes) second-place finish to the Progressive Conservative incumbent.

Second place in 1993, and the so-called moral victory that went with it, went to Dr. Ed Agnew, the Reform Party candidate, whose 11,163 votes were an astronomical increase of 9,585 votes over his party's 1988 total. Although Reform clearly had stolen votes from the conservative wing of all three parties, the vast bulk of their new-found strength was obviously secured at the expense of the Progressive Conservatives, whose vote seemed to all but collapse. In fact, Larry Maguire, whose party had held this seat with relative ease in each of the last 15 elections, polled 9,136 fewer votes than his party's 1988 total of 17,372, and placed third with 8,236 votes. The New Democrat, the last of the "major" candidates to be considered, finished fourth with 4,359 votes, compared with his party's third-place finish in 1988 with 5,018 votes. Significantly, the NDP loss of almost 600 votes compared

relatively closely with the Liberal gain of 726 votes.

Clearly Glen McKinnon and local Liberals, whose role in retrospect appears rather ironically to have been largely that of attempting to hold their vote, primarily owed their success on 25 October 1993 to the several thousand former Progressive Conservative supporters who switched to the Reform Party. In fact, and perhaps to no one's surprise, the loss of 9,136 Progressive Conservative votes corresponded closely to the increase of 9,585 in the Reform vote.

On the other hand, but less obviously so, this Liberal victory in Brandon-Souris depended on the party's ability to withstand Reform's surge. Consequently, McKinnon could win only if the Progressive Conservative campaign avoided total collapse. Had there been a loss of another 968 conservative votes to the Reformers, Dr. Ed Agnew would have become the local MP and the Reformers' claim to the status of Her Majesty's Most Loyal Opposition in the House of Commons would have been even stronger. Ironically, a Reform victory would also have meant that a Brandon, rather than a rural, resident would once again have been the MP!

And although the what-ifs of history are at best an entertaining exercise, one cannot help but speculate that if Jim McCrae had been the Progressive Conservative nominee, he would have been more attractive to urban voters, thereby reducing McKinnon's vote somewhat in Brandon. On the other hand, rural voters would very likely have found the urbanite McCrae less appealing than fellow farmer Maguire, and more rural votes would have been lost to the Reformers.

As any combination of lost Liberal support and increased Reform strength that totalled 968 would have made Ed Agnew rather than Glen McKinnon the winner, the mayor of Virden may well have owed his historic achievement to the triumph of a fellow rural resident of a different political persuasion in a hard-fought nomination battle several months before. Of such strange and seemingly unlikely factors are election victories sometimes made.

In the search for similarities between the two elections in which rural residents were successful in Brandon(-Souris), it is evident, first of all, that both elections occurred at a time of political turmoil, when the fortunes of the traditional political parties were undergoing sweeping change. More precisely, the sharp decline in the fortunes of the traditional parties created a window of opportunity both for a new political party and for a rural candidate. In fact, the severe decline in the Conservative vote in 1921, combined with the widespread decision of the traditional Liberal vote to "park" with the Progressives, made that first election of a rural farmer-candidate in Brandon virtually inevitable.

In 1993 the circumstances were similar but the specifics were different. Perhaps up to one-half of the traditional Progressive Conservative vote shifted (for a length of time yet to be determined) to the Reform Party, so a new party was the beneficiary, as in 1921. Unlike in 1921, the Liberal vote in Brandon-Souris expanded ever so slightly (thanks in part to the decline of the NDP), which prevented the Reform candidate from "slipping up the middle," as was the case in many other western Canadian constituencies in 1993.

Unlike in 1921, when the rural domicile of the candidates was all-important, the Progressive Conservatives were the only party to seriously consider this factor in 1993. Ironically, their desire to select a rural candidate may well have contributed significantly to the success of the Liberals' own rural candidate. Thus Virden's Glen McKinnon joined Pipestone's Robert Forke in that exclusive group of two rural residents who have earned the right to be addressed by the Speaker of the House of Commons as the Honourable Member for Brandon(-Souris). In such a manner is history made.

NOTES

1. For the purpose of this study, the 1896 election of D'Alton McCarthy in the newly established federal constituency of Brandon is ignored. McCarthy, the MP for North Simcoe, had taken the precaution of being nominated in two constituencies. As he was successful in both, he never claimed his "second" seat. Clifford Sifton was elected by acclamation in the subsequent by-election, and become Brandon's first "real" Member of Parliament.
2. This was the conclusion of Brandon alderman and active Conservative George Coleman, who informed the former Minister of the Interior that "your splendid stand on this matter had been one of the main factors in the defeat of the [Reciprocity] pact . . . for my part, whether on the platform or in canvassing, your opinion was one of my strongest arguments because it was the opinion of one who was not running himself in the Election and had the courage to break with his Party on this great question," PAC, Clifford Sifton Papers, Vol. 196, 156283, G.B. Coleman to Sifton, 26 September 1911. Sifton himself agreed that "a good many of my friends adopted my view and supported the Conservative candidate," ibid., 156285, Sifton to G.B. Coleman, 26 September 1911.
3. "There has always been a very strong constituency consciousness in Brandon from the time of Clifford Sifton. I very much doubt if any outsider would carry it in a general election although some who know the constituency well tell me there would be no difficulty in a by-election," PAC, A.K. Cameron Papers, T.A. Crerar to A.K. Cameron, 23 November 1929.
4. Forke succeeded T.A. Crerar as national leader of the Progressives in 1922, the riding's only representative to achieve such leadership status. Prime Minister Mackenzie King, who consistently characterized Progressives as "Liberals in a hurry" who could be "wooed" back into the fold with astute policy-making and the passage of time, persuaded local Liberals not to oppose the Progressive leader in 1925. PAC, M. King Papers, J1 series, 103245, King to T.C. Norris, 23 November 1925.
5. As part of the "wooing" of Forke himself, the MP for Brandon was nominated by both the Liberals and the Progressives, but in two separate meetings in preparation for the 1926 election. Shortly after that successful campaign, Forke was invited to join Mackenzie King's government as Minister of Immigration.
6. In 1929, following the Honourable Robert Forke's appointment to the Senate, T.A. Crerar (a former farm leader, former Liberal Unionist, and former national leader of the Progressives) was appointed Minister of Railways and Canals in the hope that he could hold both the Brandon seat and the farm vote in general.
7. In sharp contrast to Reform's obvious desire to achieve the status of Official Opposition, the Progressives, who were second in 1921 with 65 seats, declined to serve in that capacity lest they be required to function as a political party in the traditional sense! Consequently,

the Conservatives (who had won only 50 seats, none of which were in the West) emerged as the Official Opposition, with an enhanced status that clearly facilitated their comeback.

8. Although Forke's greatest strength as expected was in the rural portion of the constituency, he also won Brandon by a vote of 2,345 to 1,741, including 20 of the city's 21 polls; *Brandon Daily Sun, 7* December 1921.
9. The fact that the implementation of the Free Trade Agreement with the United States was followed almost immediately by the proposed North American Free Trade Agreement (NAFTA) only added salt to the wounds of some.
10. Although the Progressive Conservative incumbent won fairly decisively with a margin of some 6,000 votes in the hard-fought "free-trade" election of 1988, his greatest strength was in the rural area.

Case Study 13.2
Local Government in Manitoba
Meir Serfaty

With the exception of Winnipeg, which has its own all-inclusive act, all local corporations in Manitoba are governed primarily by the provisions of the Municipal Act. Winnipeg's system of government has undergone considerable transformation in the past 35 years. The first significant change occurred in 1960, when a two-tier (metropolitan) system was introduced. The metropolitan government was responsible for, among other things, planning, zoning, assessment, and garbage disposal, while the 10 municipalities included within the city retained a certain amount of autonomy over other local matters. Nine other municipalities formed part of an "additional zone" and were included in Metro for planning purposes only. This system was replaced in 1972 by the creation of Unicity, a single tier formed by the amalgamation of 12 municipalities.[1] With some adjustments, this system is still in place today.[2]

In stark contrast, the governing of all other municipalities has remained virtually unchanged since passage of the Municipal Act in 1902. The act provides for the establishment of cities, towns, villages, and rural municipalities (RMs). Cities, of which there are five (Brandon, Flin Flon, Portage la Prairie, Thompson, and Winnipeg) must have over 10,000 residents and are incorporated by a special act of the legislature. Towns, of which there are 36, need to have 1,500 and villages (38) 750 inhabitants in order to be recognized by the provincial government.

The province is divided into RMs (106), and in some sparsely populated areas into local government districts, or LGDs (17).[3] Other than the latter, which are run by provincially appointed administrators, all municipalities are granted autonomy and are ruled by elected politicians (mayors in cities, towns and villages, and reeves in RMs, as well as councillors) and by locally appointed administrators, referred to as secretary-treasurers or city managers. (A four-person board of commissioners administers Winnipeg.) The roles of municipalities, councils, mayors, administrators, and special-purpose bodies are outlined in the Municipal Act. It is important to note that services provided range from those that are compulsory (fire, policing, education, administration) to those that are optional (parks and recreation, garbage collection, etc.). The level of services provided depends on the financial capabilities of the corporation and on the local demand for them.

Regardless of size or importance, Manitoba local governments, like all Canadian municipalities, are constitutionally and legally subordinate to the province. The latter can and often does alter local functions, physical boundaries, mode of election, and so on. Indeed, the sole constraint on provincial government actions is purely political and the result of the North American tradition of grass-roots democracy. Subordination manifests itself in many ways. For example, local by-laws and resolutions can be disallowed by the province, and municipalities are not free to borrow money for capital expenditures without provincial approval, nor impose taxes or enter into activities not permitted by the Minister of Rural Development.

Other relevant acts affecting municipalities include the Planning Act (1975), the Assessment Act (1990), the Local Authorities Elections Act (1970), and the Municipal Board Act (1982). In Manitoba, RMs, villages, towns, and cities may decide of their own accord to cooperate in matters of land use, zoning, and planning by forming planning districts. The 27 currently in existence have boards made up of councillors from the various partner corporations, which make decisions and administer the matters set out in their provincially approved development plans (Case Study 13.3 on page 193).

The Assessment Act establishes regulations and guidelines regarding the evaluation of all property throughout the province by provincial assessors (Winnipeg conducts its own assessment). Assessment is important because the bulk of local revenue comes from the collection of property taxes, which are based on property values.

The Local Authorities Elections Act stipulates general conditions for the conduct of local elections, which are held throughout the province in October every three years. Finally, the Municipal Board is a significant provincially appointed quasi-judicial body that makes rulings on assessment and planning appeals and on capital borrowing, and makes recommendations to the Minister of Rural Development on a host of other locally related matters.

Because of their size and extensive level of activity, larger cities such as Brandon have in recent years made repeated calls to be treated in a manner similar to Winnipeg. Thus far, the province has resisted granting special treatment to any municipality.

NOTES

1. The municipalities included in Unicity were: Charleswood, Fort Garry, North Kildonan, Old Kildonan, East Kildonan, St. Boniface, St. James, Assiniboia, St. Vital, Transcona, West Kildonan, Winnipeg, and Tuxedo.
2. A good summary of the development of local government in Winnipeg is

contained in C.R. Tindal and S.N. Tindal, *Local Government in Canada*, 2nd ed. (Toronto: McGraw-Hill Ryerson, 1990), 89–98. This book, and D.J.M. Higgins, *Local and Urban Politics in Canada* (Toronto: Gage, 1986), are useful introductory texts.

3. Rural municipalities range in size from a low of 18 km² (Victoria Beach) to a high of 1,883 km² (Portage la Prairie), whereas local government districts range from 51 km² (Churchill) to 3,607 km² (Mystery Lake).

Case Study 13.3
Planning Districts in Manitoba
Ronald W. Tompkins

The 1970s were years of vigorous development fuelled by a strong economy and the maturation of the postwar baby boom generation. The increasing popularity of the automobile, coupled with accumulated improvements to the road network, made rural areas very accessible for new residential, commercial, industrial, and recreational developments. The 1970s were also years of heightened public awareness of environmental and resource issues, such as the contamination of waterways and the loss of farmland and wildlife habitats resulting from various human activities. Development pressures and issues extended beyond traditional community boundaries into rural areas, and with this came the need for more effective management processes.

In response, the Manitoba Legislature enacted the Planning Act in 1975, which replaced previous planning legislation and created new opportunities for municipal involvement in various land-use, land-development, and resource-management issues. One of its central features is a provision enabling groups of two or more municipalities to voluntarily form planning districts in order to provide for more coordinated and comprehensive intermunicipal planning programs.

Each planning district has a district board typically composed of an equal number of elected representatives from each participating municipal council. The Planning Act authorizes planning districts to perform a number of functions, the most significant of which are:

(1) To prepare, adopt, and administer a comprehensive planning program for all areas within the planning district. This planning program is embodied within a "development plan" consisting of a series of objectives, policies, and programs governing land use, land development, and resource management in the planning district, along with a map or series of maps illustrating the long-term development strategy for the district.

A development plan is intended to achieve a balanced approach to these issues by promoting the orderly and efficient development of established communities, along with the sustainable use of various resources such as farmland without creating unacceptable environmental problems. Public participation is encouraged during the preparation and adoption of a development plan.

(2) To administer various regulatory programs. Municipalities have the legal authority to administer local zoning by-laws, maintenance and occupancy by-laws, and portions of the building code. Because of the relatively low level of development activity and the limited fiscal resources of most individual municipalities, it is either difficult or impossible for them to effectively administer these regulatory programs individually. Within a planning district,

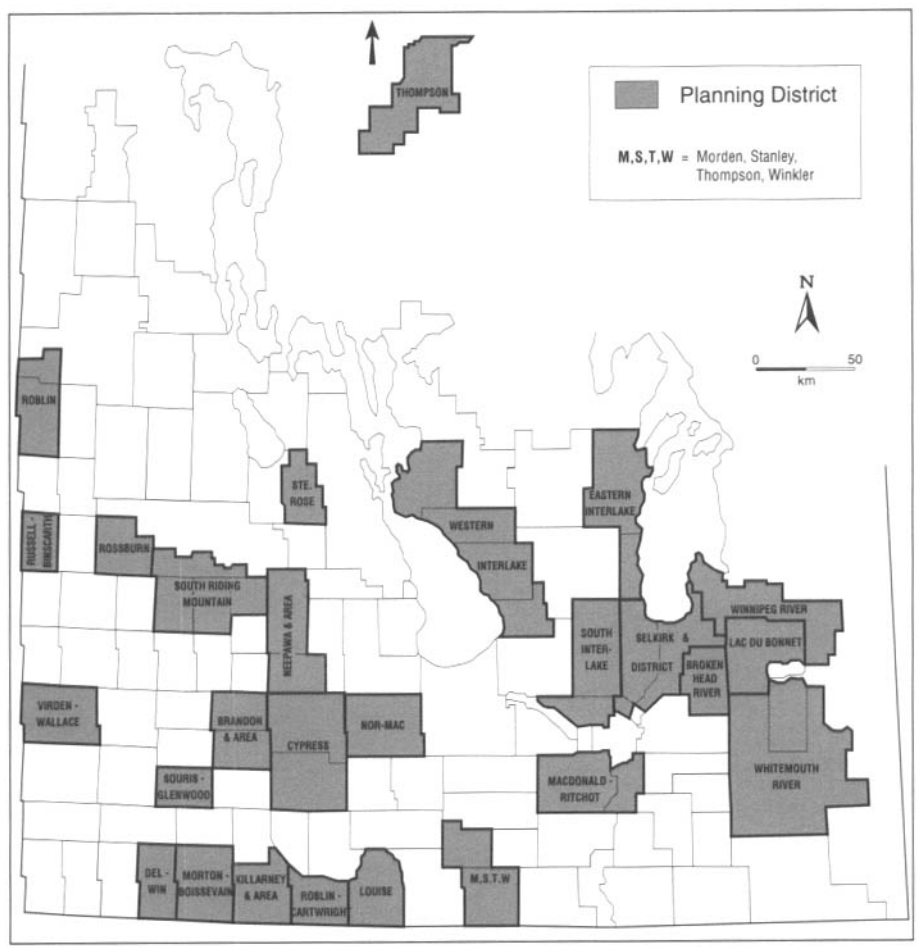

Figure 13.3.1 Planning Districts in Manitoba

financial and staff resources can be shared for this purpose.

(3) To assume several responsibilities that are otherwise administered at the provincial level, principally giving final approval of subdivision applications and acting as an appeal body for municipal zoning decisions.

A number of planning districts have been established in Manitoba since the adoption of the Planning Act (Figure 13.3.1). By the end of 1993, there were 27 planning districts consisting of 75 municipalities. To a significant extent, the distribution of planning districts coincides with areas of significant development activity, such as the commuter areas near Winnipeg and Brandon; some of the larger towns such as Winkler, Morden, Neepawa, and Virden; and the major resort areas located in eastern Manitoba, the Interlake area, and south of Riding Mountain National Park. The planning-district program has been widely accepted in Manitoba.

In recent years, the Manitoba government has focused on rural economic development. The municipal partnerships fostered in the planning-district program can also play an important role in promoting rural economic diversification in years to come.

PART 3

RESOURCES AND INDUSTRY

In most people's perceptions, Manitoba is probably associated with resource use and development, especially with agriculture and grain growing. Grain growing in Manitoba has been closely associated with the development of grain elevator and railway systems (J. Everitt, Chapter 14). Both elevator companies and railway lines came and disappeared rather rapidly. A company that persisted is N.M. Paterson and Sons Ltd. (J. Everitt, Case Study 14.1 on page 216), whereas one of the ephemeral railway lines was the Lenore extension (A. Williams and J. Everitt, Case Study 14.2 on page 217), which opened in 1903 and closed in 1980 — a prime example of the process of railway abandonment that became rampant in the 1980s.

Grain — particularly wheat — is still grown extensively in southern Manitoba, but agriculture is now much more diversified, intensified, and mechanized than it was before World War II (W. Carlyle, Chapter 15). Some of the most efficient and mechanized operations are found in the over 80 Hutterite colonies sprinkled across southern Manitoba (J. Ryan, Case Study 15.1 on page 233). The success of these communal-living farmers results from the combined efforts of the group, but many agricultural achievements and developments have been the work of individuals, some of whom are commemorated in the Manitoba Agricultural Hall of Fame (F. McGuinness, Case Study 15.2 on page 235).

If agriculture dominates the south and west, mining and mineral extraction suggest the north and east — the Canadian Shield. But this is not exclusively the case: Manitoba's oil wells are concentrated in the southwest (H. Young, Chapter 16). A remarkable variety of minerals are extracted in Manitoba, some by open-cast methods, others by innovative subsurface methods (C. Bristol, Case Study 16.1 on page 251).

The dominance of agriculture in the past has tended to obscure the role of manufacturing in the Manitoba economy (D. Todd, Chapter 17). To be sure, the manufacturing is often closely related to the agricultural base (P. Curtis, Case Study 17.1 on page 262), but increasingly the manufacture of high-tech products is coming to the fore and meeting the challenges presented by the North American Free Trade Agreement (NAFTA) (J. Ryan, Case Study 17.2 on page 264).

One advantage Manitoba has for manufacturing is the availability of cheap electricity based on the generation of hydro power, chiefly in the north. Although their use for hydro power is relatively new, the province's rivers and lakes have been an important element of its geography since the earliest phase of human settlement (J. Welsted, Chapter 18). Fishing is not commonly associated with the Prairies, but in the past — and still today — it was an important element of the economy (F. Tough, Case Study 18.1 on page 281).

Floods have been a recurring theme in the province's history; residents of the Assiniboine Valley in particular will remember the floods of 1995. But the most disruptive and most damaging was the

massive 1950 flood that devastated much of Winnipeg and the Red River Valley to the south. It led to a call for flood protection for these areas, and eventually to the building of several structures aimed at preventing a repeat of 1950 (W. Rannie, Case Study 18.2 on page 283). On a much smaller, more local scale, the level of Pelican Lake has fluctuated considerably within historical times, affecting its potential as a recreational resource and leading to several attempts to stabilize its level (J. Welsted, Case Study 18.3 on page 285).

THE DEVELOPMENT OF THE GRAIN TRADE IN MANITOBA

14

John Everitt

Historically, grain has been one of the primary contributors to Canadian economic development [and was particularly] vital to [the formation] of the Prairie Provinces. The potential for the commercial production of grain attracted the settlement, sustained the population which homesteaded there in the latter part of the past century and the early part of the present one, and converted the grassy plains into cultivated land.[1]

The production of staple goods has characterized Manitoba since this peripheral region was first integrated into what Wallerstein has termed the "modern world system" as an area of fur production around 1670.[2] When Manitoba became the first province "of Canadian creation" (and the fifth overall) in 1870, it was still very much dominated by the fur trade. But this "old Manitoba" was soon to be "engulfed in the new Manitoba," with the fur trade giving way to the grain trade and "the cart brigade to the railway train."[3]

The economy of Manitoba has traditionally been dominated by wheat, and although Canada is today only the fifth-largest wheat producer in the world, it is the second-largest exporter.[4] The vast bulk of Canada's wheat (97 percent in 1991) is raised in the three Prairie provinces, and although this small grain characterizes agricultural production in Manitoba less today than in the past (Chapter 15), it was very much responsible for the early development of the province.

"The prairie west," as Friesen has demonstrated, "was intended to be Canada's settlement frontier," and the process of settlement was so successful that by the late 1920s the wheat economy was firmly established, and the wheat landscape was firmly built (Table 14.1).[5] Wheat had become "the keystone in the arch of Canada's national policy. Its production and sale made possible the construction of transcontinental railway systems, and the extension of political control across the continent to the Pacific."[6] The economic potential it offered attracted settlement to the Prairies, sustained the people who colonized the region, and led to the transformation of the cultural landscape (Figure 14.1).

INITIAL DEVELOPMENT OF THE GRAIN-STAPLE ECONOMY

Growing wheat in Manitoba dates back to the settlers in Lord Selkirk's Red River Settlement, established in 1812 (Chapter 6).[7] The Selkirk colonists had their first successful harvest of spring wheat in 1815, but not until 1831 did a normal harvest yield a marketable surplus, enabling the Hudson's Bay Company (HBC) to stop importing flour from England. But as the HBC was the single available market for the farmers, and could absorb only a small amount of wheat, the Red River settlers were described as "smothering in their own fat" by the governor of Minnesota 20 years later, in 1851.[8]

Thus, despite its potential, the "West was held stationary in the grip of a 'production limit' governed by actual 'home consumption'."[9] Unfortunately, the solution to this

Table 14.1 Wheat Acreage, Canadian Prairies, 1901–91

Year	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991
Manitoba										
Total acres on farms (thousands)	1,965	3,095	2,819	2,617	2,465	2,326	2,914	2,519	3,936	5,372
Acreage per farm[1]	61	71	53	48	42	44	67	72	134	209
Saskatchewan										
Total acres on farms (thousands)	487	5,255	11,684	15,026	12,195	15,635	16,082	12,923	19,370	21,242
Acreage per farm	36	55	98	110	88	140	171	168	288	349
Alberta										
Total acres on farms (thousands)	43	1,640	4,886	7,943	6,556	6,424	5,633	3,443	6,705	7,715
Acreage per farm	5	27	59	82	66	76	66	55	116	135
Prairies										
Total acres on farms (thousands)	2,495	9,990	19,389	25,586	21,216	24,385	24,629	18,825	30,011	34,329
Acreage per farm	45	50	76	89	72	98	131	108	194	239

Notes:
1. Based on the total number of farms per province.

Sources: Data for 1901–61 taken from E.J. Tyler, *The Farmer as a Social Class* (Winnipeg: United Grain Growers, 1969), 97, table 4; for 1971–91 from Statistics Canada, *Census Overview of Canadian Agriculture 1971–1991 Catalogue 93-348* (Ottawa: Statistics Canada, Ministry of Industry, Science and Technology, 1992), table 7.

problem — exports — and the transformations of the landscape that would accompany it, could not be initiated until there was an external demand for Prairie wheat, as well as a means of supplying the wheat. This demand did not come until Prairie wheat was needed as a milling grain in Ontario and Quebec, followed by the rest of the world, and this itself had to follow a demonstration that Red Fife wheat could be successfully grown in Manitoba.

Although originally grown in eastern Canada,[10] this all-important wheat variety had diffused from the United States to Manitoba by about 1870 along a route through the northern tier of states, at that time the most common way of moving from eastern to western Canada. Its passage via farms and grain dealers in the United States took some 10 years,[11] but it was soon to "replace the prime beaver" as an economic staple for the Prairies.[12] The excellent quality of Manitoba wheat grown from Red Fife seed was acknowledged in 1876 after the Ontario Red Fife crop failed. Following this misfortune, R.C. Steele, of Steele Brothers of Toronto (a seed company), took the American route — by rail to St. Paul, then to Fisher's Landing in Minnesota, and then overland to Winnipeg (frontispiece). As a result the "grain trade

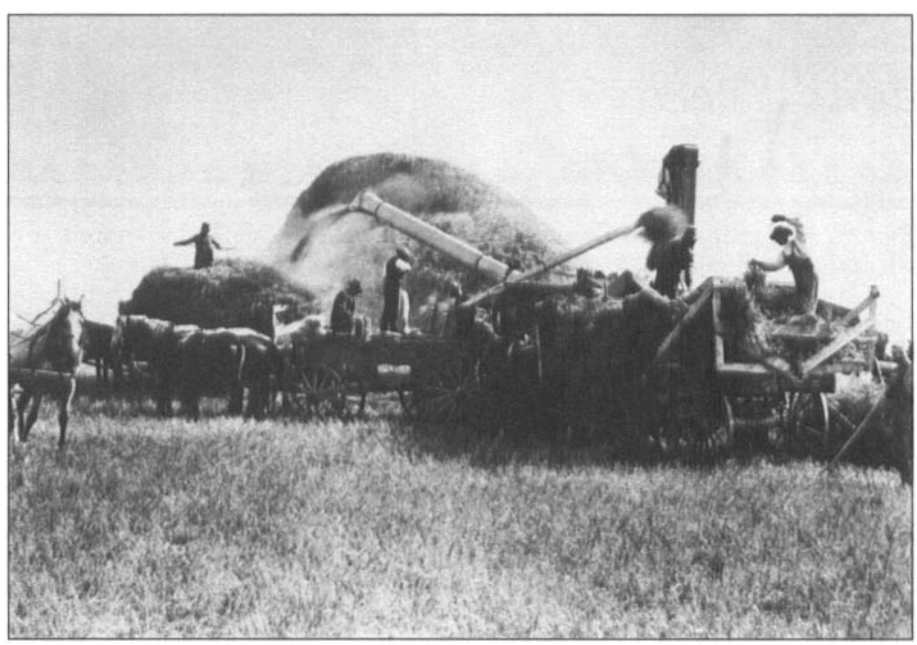

Figure 14.1 Harvesting at Deloraine in the early 1900s (Photograph: CP Rail System)

of the western provinces made its first hesitant step" on 12 October 1876, when 857-1/6 bushels of Red Fife wheat were sold for export to Ontario for seed.[13]

This first export shipment of Canadian Prairie wheat out of necessity took a route to eastern Canada through the United States. It was shipped from Winnipeg on 21 October 1876 by the Red River steamer *S.S. Minnesota,* owned by a company dominated by future St. Paul railway magnate James J. Hill. It went south to Fisher's Landing and was then shipped "by rail to Duluth, by vessel from Duluth to Sarnia, and by rail from Sarnia to Toronto."[14] Further wheat surpluses in the late 1870s continued to move south along the Red River, but a need for a better route became evident in order to guarantee the growth of the production and transportation systems, to curtail "emigration to the American frontier, and to accelerate the emergence of wheat as the Canadian export staple."[15]

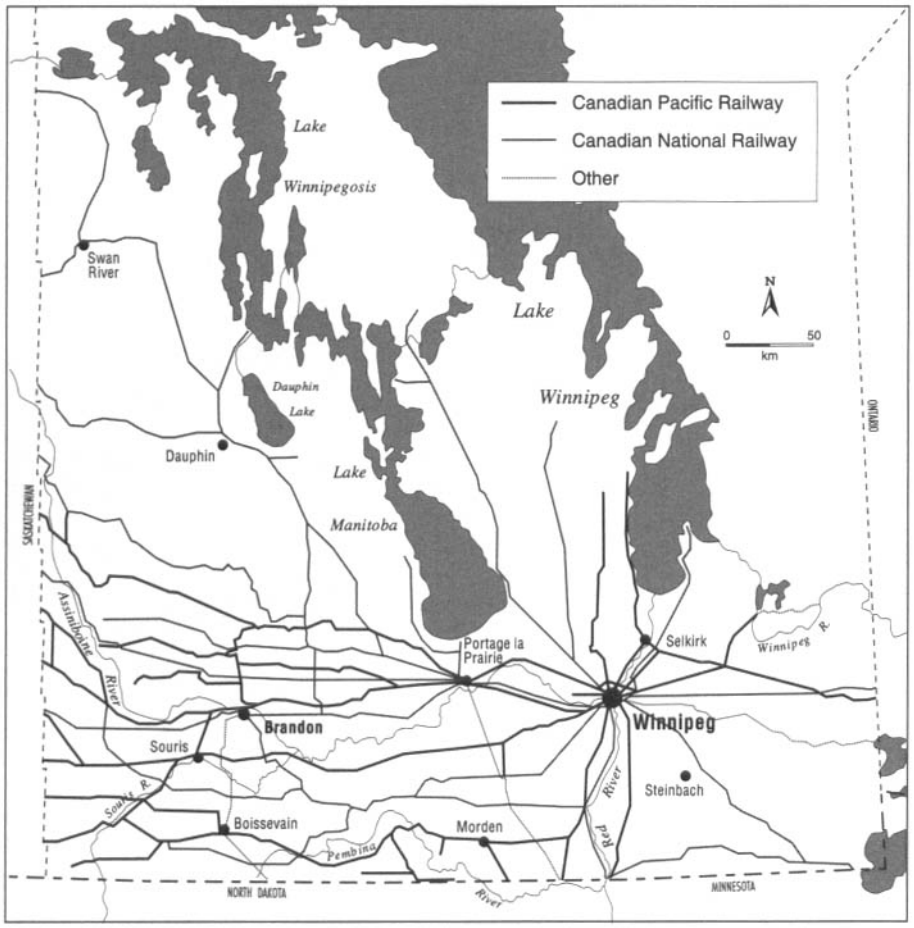

Figure 14.2 Railway Map of Manitoba in 1920 (Source: Based on National Archives of Canada, National Map Collection A2/501/1920/1, NMC 23248)

The cultivation of spring wheat in the Canadian Prairies and adjoining American areas was also encouraged by a revolution in the milling industry between 1870 and 1880. Red Fife wheat had not originally enjoyed favour with millers because its flinty kernels would not produce the kind of flour desired.[16] In 1870, however, the first La Croix "purifier," based upon a French invention that separated branny particles from middlings, was introduced into Minnesota to solve this problem. In addition, during the 1870s the introduction of "the gradual reduction process, involving the substitution of chilled iron rollers for the traditional millstones, brought about a veritable milling revolution."[17] Together, these innovations led to larger, lower-cost structures that produced a superior product.

These changes were incorporated into Winnipeg mills in 1882, gave impetus to the demand for spring wheat, and brought the crops of the Prairies and the Dakotas "into high favor." Red Fife wheat, in particular, rose to premium rank, and the importance of milling proved to be so great that it seems certain that without the invention and spread of the new technology, the growing of spring wheat in the West, and thus the development of western Canada, might have been greatly retarded.

By 1878 some Prairie grain even made its way to Britain, but still as a result of the Red River connection. In that year "great was the relief" of Winnipeggers when the first railway, the St. Paul, Minneapolis and Manitoba, entered the province and provided effective rail communication with Minneapolis.[18] Notably, however, it came from the south and was controlled by the opportunistic James J. Hill.[19] "This new means of communication gave a direct connection between St. Paul in Minnesota and the little town of St. Boniface on the right bank of the Red River."[20] Unfortunately, although this railway was clearly "a great boon and formed a splendid link with the United States," it was obvious that "something was still lacking."[21]

This deficiency was remedied by the decision to build the Canadian Pacific Railway (CPR) line to connect eastern Canada with the west coast following an all-Canadian route rather than running south of the border. Besides providing a more direct freight link with the eastern provinces, this action provided the means whereby a "Canadian settler no longer had to pass through Chicago and Minneapolis *en route* to the prairies, and was thus less likely to settle very far south of the Canadian border" (Figure 14.2).[22]

On Dominion Day, 1 July 1886, the first train from Montreal to Vancouver passed through Winnipeg. This ended the dominance of the western trade route through the United States and led directly to the acceleration of grain growing on the Prairies.[23] It also led to the rapid demise of the Minnesota connection, "as Winnipeg emerged as the key city of the Canadian West"[24] and "the converging point of a great wheat funnel, the spout of which [led] to the water-front of Lake Superior"[25] and thence to the world.

The first grain cargo from western Canada destined for overseas had been carried from the "Head of the Lakes" by James Richardson and Sons in the fall of 1883, following the completion of the CPR line to Lake Superior. Apart from stimulating grain exports, of course, this line and those that followed it became promoters of immigration and settlement, which in turn stimulated the grain trade and thus more railway building (Figure 14.3).[26]

Although the competitive nature of railway construction, particularly in Manitoba, meant that many areas of the province, especially the southwest, were soon overbuilt, the surfeit of railway lines did not occur until the defeat of the CPR, which tried to prevent branch line construction by other companies. The monopoly clause in the CPR's agreement with the federal government was cancelled in 1888 as part of a refinancing deal, and a series of

other railway companies appeared in the Prairie landscape (Figure 14.2).[27]

THE BULK HANDLING OF GRAIN

If the United States connection was a major characteristic of wheat shipments from Manitoba in the early years, so was the method of handling the grain. Bags were the traditional form of conveyance and continued to be so for some years, although with diminishing importance. However, this method was quite inefficient, involving filling, emptying, loading, and unloading the bags several times during the journey; and although reusable, the bags had to be purchased — an additional cost to financially strapped farmers.[28] Even the first lake shipment from Port Arthur was loaded partly in bags because no facilities existed for bulk grain handling.

The completion of the first "terminal" elevator by the CPR in 1884 alleviated this situation,[29] and the first shipment of wheat by an "all-British" route from Brandon to Glasgow soon followed. In 1885 the first carload of western wheat left Winnipeg by railway for Montreal. The way was now open for a larger export trade. The introduction of bulk handling of grain coincided not only with early railway connections to the Lakehead from the Prairies but more importantly with the construction of country elevators.[30]

Like so many features of the Canadian cultural landscape, the grain elevator originated in the United States. The first elevator, a terminal elevator, was built in Buffalo in 1841, but it was not until the endless cup conveyor — known as a "leg" — was invented "that the country elevator as it is now known came into existence."[31] As Dondlinger indicates, the chief functions of the elevator "are storage; cleaning, drying and gathering wheat; and the vertical and horizontal transportation incident to these processes and to the processes of loading and unloading from wagons, cars and ships" (Figure 14.4).[32]

Although grain handling without bagging was well known in the United States before the opening of the Canadian West, the use of bags survived in the Prairies for another two decades, often combined with an intermediate stage, the flat warehouse. These were usually one-storey, gable-roofed, wood-frame structures built by small, often local grain dealers (Figure 14.5). Farmers brought their wheat to these warehouses in bags or in loose form, for sale and shipment to Winnipeg.

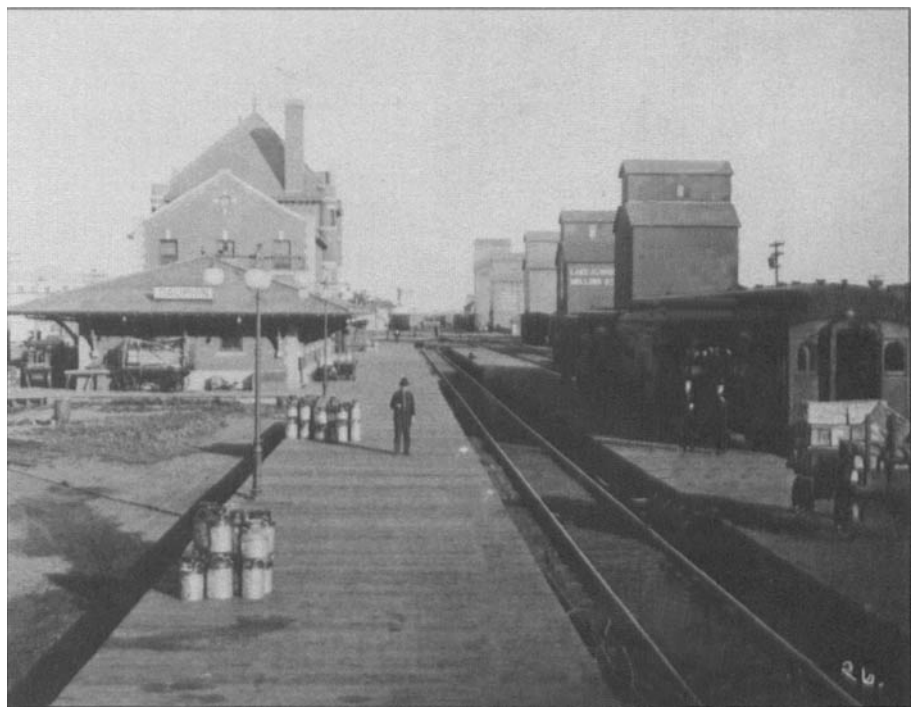

Figure 14.3 The Station at Dauphin, Built in 1912 (Photograph: National Archives of Canada, Negative C33360)

After considerable early use, the flat warehouse proved unpopular in the United States, and although initially exploited successfully north of the border, it was soon rejected by the leaders of the Canadian grain trade for being labour-intensive and relatively inefficient. This was because the essential element in the flat warehouse story was a negative one — the structure was a *flat* building and not an elevator that could make use of gravity to move the grain. They were eventually discarded.

The elevator system appeared very early in the history of the grain trade in western Canada. The first of the standard elevators — which were given preference over flat warehouses in shipping by the CPR — was built by the W.W. Ogilvie Milling Company at Gretna, Manitoba, in 1881.[33] A standard elevator was defined by the CPR as having not less than 25,000 bushels of capacity, and was meant to be equipped with both elevation and cleaning machinery (Figure 14.6). Although these conditions were not strictly enforced everywhere all the time, they led to the standardization of grain elevators, and thus of the Prairie landscape.[34] This standardization was reinforced by the fact that many elevators were built by companies according to more or less standard designs.

Because of problems of capitalization, the CPR farmed out the elevator business, although it "retained in its own hands almost all other services subsidiary to railroading."[35] The CPR, and later the Northern Pacific and Manitoba (NP&M), Great Northern (GN), Canadian Northern (CNor), and Grand Trunk Pacific (GTP) systems, gave incentives for construction of lines of standard elevators, so country elevators began to spread across the Prairies.[36]

Groups of elevators under common ownership came to be known as "line elevators" because they were commonly located along a single line of railway. The companies that owned them were called "line elevator companies."[37] The corpo-

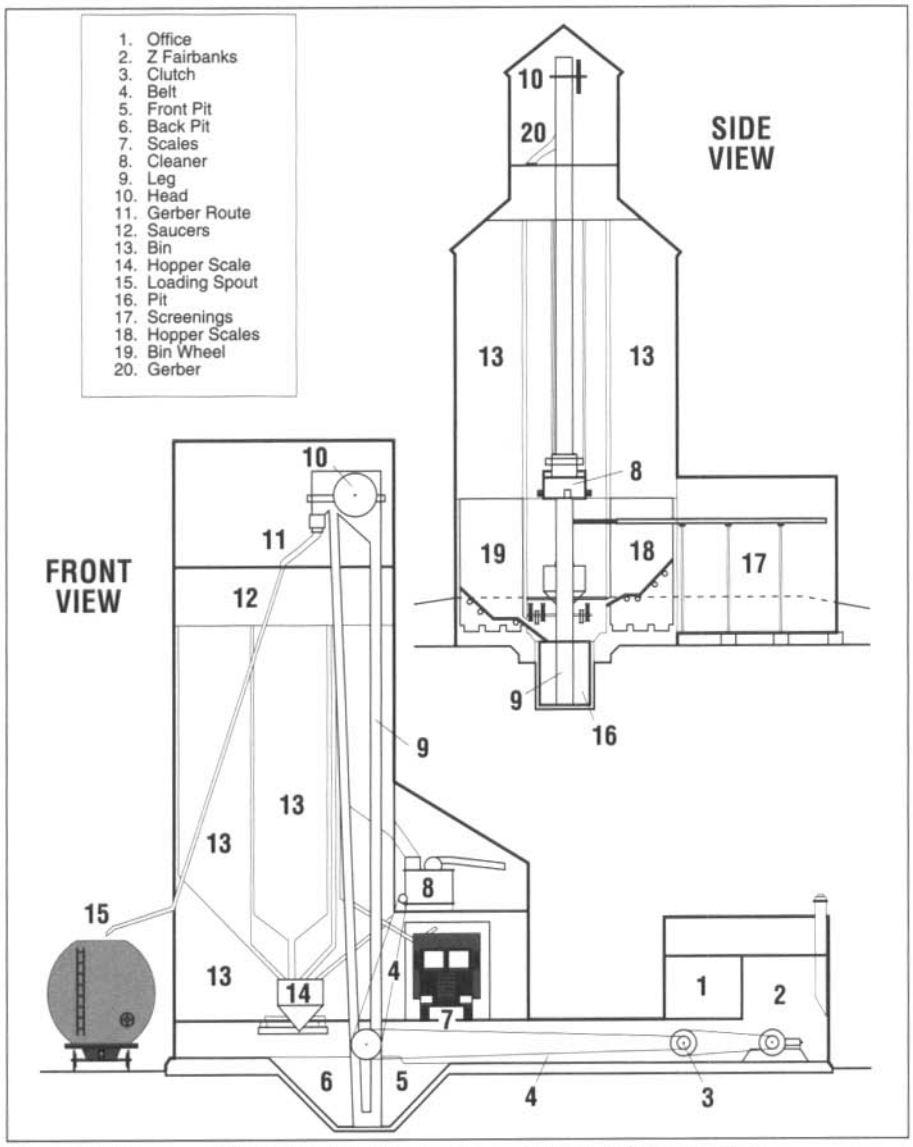

Figure 14.4 Cross-profile of a Prairie Elevator (Source: United Grain Growers)

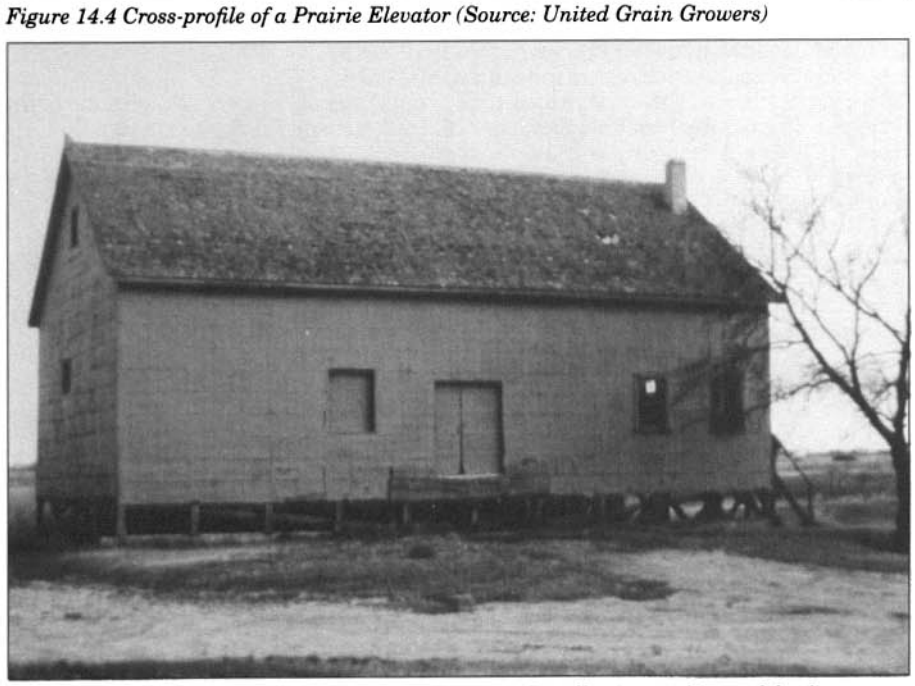

Figure 14.5 Brookdale Flat Warehouse Built in 1902. It still exists and is used for farm storage (Photograph: J. Everitt)

rate intertwining of elevator and railway companies had a major impact on the landscape both in the countryside and in the small towns,[38] but this development did not take place uniformly. A number of distinct stages can be distinguished, and they affected Manitoba in very different ways.

Canadian Entrepreneurs Dominate

In the initial stages of development, many grain trade entrepreneurs built one or a few elevators and/or flat warehouses along the lines of the CPR. Although the flat warehouses were mostly owned by small-scale operators, most of whom (except for their names) seem to have been lost to history, they provided a cheap entry-level structure for dealers who became very important in the grain trade. They were often constructed at new stations to test the waters of the region or to make an immediate entry into the area, or because capital and/or equipment were not available for elevator construction.

For instance, in 1884 Nicholas Bawlf (who became a legend in the grain trade) owned only one warehouse, and D.H. McMillan (soon to become another major player in the elevator industry) owned more warehouses than elevators. By 1890 Bawlf owned seven warehouses, leasing his first elevator in 1891 and buying it in 1892. It may have been the only elevator he owned before he organized the Northern Elevator Company in 1893.

Some owners were headquartered in Montreal, some in Winnipeg, and some in small rural settlements, but at this time they appeared to be all Canadians.[39] By 1884 there were 28 owners of 39 "country (flat) warehouses," and 13 owners of 27 country elevators, with three operators appearing in both lists.[40] However, the W.W. Ogilvie Milling Company dominated, because of its greater capitalization and as a result of an agreement with the CPR that gave it privileges denied to others.[41] By 1884 Ogilvie Milling owned nearly one-third of the structures and had almost 40 percent of the storage capacity — perhaps not the monopoly position

ascribed to this company by many dissident farmers, but still a significant share of the market (Table 14.2).

Not surprisingly, the distribution of the grain storage capacity was predominantly Manitoban, with all but 8 of the 27 stations being in this province (Table 14.3). There was little change in this overall pattern in 1890, when the CPR had been joined by the Manitoba and North Western (M&NW) Railway[42] and the Northern Pacific and Manitoba (NP&M) Railway,[43] as only the CP main line extended into the Northwest Territories (Figure 14.2).[44]

The importance of the Ogilvie Milling Company continued, albeit at a lower level (Table 14.4), with it remaining the largest elevator owner for nearly another decade. In addition, the fact that up to 1889 "Mr. Ogilvie (had) purchased more than half of all the wheat grown in Manitoba and the North-West Territories" continued to give credence to the claims of the farmers that a monopoly existed.[45] The Ogilvie affiliation with the CPR also endured; in 1902, even after the competing lines were completed, the company had all of its buildings on CPR lines or on lines of companies that were soon absorbed by it (Figure 14.7).[46] Even in 1920, when most of its elevators had been constructed, over 90 percent were still on the CPR (Figure 14.8).

By 1890, however, other major companies had begun to share in the elevator business, including the Lake of the Woods Milling Company (LofW), which was founded in 1887 with George Stephen and Sir William Van Horne, of CPR fame, among the original subscribers to its share capital. It was the third-largest elevator owner by 1890 and second-largest by 1892, and was destined to grow rapidly (Tables 14.2 and 14.4). LofW was also initially concentrated (100 percent) on the CPR, although by 1902 it had begun to erect elevators along Canadian Northern lines.[47]

Faced with these developments, the smaller operators soon realized that they could not compete independently with the large milling companies, and also "that elevator operation usually proved profitable only when the management undertook not only the handling but also the merchandising of grain."[48] This usually meant that a large scale of operation was necessary, that the smaller companies had to form syndicates in order to survive, and that operators of one or a few elevators were at a serious disadvantage. The options thus appeared to be to grow or die, and a number of businessmen began taking actions that would soon lead them to assume a critical and long-lasting position in the industry.

Thus changes were coming about as the grain trade naturally developed, but they were accelerated by the solicitations of the CPR for more rapid elevator construction. The first example of a major amalgama-

Figure 14.6 British America Elevator, Swan River, Built about 1914. (Photograph: National Archives of Canada, Negative PA21103)

Table 14.2 Elevator and Warehouse Ownership by Selected Companies, 1884–1924

	1884	1892	1902	1911–12	1924–25
Ogilvie	20	35	59	118	166
LofW[1]	0	19	50	88	119
Maple Leaf	0	0	0	46	61
WCFM[1]	0	0	0	79	90
Dominion	0	0	70	43	51
Northern	0	0	112	102	100
Winnipeg	0	0	52	0[2]	0
Canadian	0	0	0	110	119
British America	0	0	0	109	123
(Farmer-owned)	2	6	26	22	0
Manitoba Elevator Commission	0	0	0	170[3]	0
UGG[1]	0	0	0	0	347
(Next-largest company)[4]	4	14	24	79	433
Prairie Total	68	281	601	2,001	4,208

Notes:
1. See text for full names.
2. Sold to Canadian Elevator Company in 1910.
3. See text for explanation of this sudden rise and fall.
4. McBean Brothers in 1884; Martin, Mitchell and Company in 1892; Western Elevator Company in 1902; Western Canada Flour Mills in 1911; and the Saskatchewan Co-operative Elevator Company in 1924.

Sources: 1884: Egan to Van Horne, 31 December 1884, CP Archives #8069; 1892, *Second Annual Report of the Winnipeg Grain and Produce Exchange* (Winnipeg: WGPE, 1892); 1902: *The Commercial*, 1902, 474–6; 1911–12: *List of Licensed Elevators in the Manitoba Grain Inspection Division* (Ottawa: Department of Trade and Commerce, 1912); 1924–25: List of *Licensed Elevators and Warehouses in the Western Grain Inspection Division* (Ottawa: Department of Trade and Commerce, 1925).

Table 14.3 Elevators and Warehouses on the Prairies, 1884–1920

Year	Manitoba			NWT[1]			Totals	
	E	W	Stn	E	W	Stn	ETOT	WT
1884	27	33	19	2	6	8	29	39
1890	82	83	71	6	19	14	88	102
1896	216	94	118	35	29	25	251	123
1901	333	76	167	88	21	50	421	970
1902	427	69	180	111	18	60	538	87
1903	558	59	216	176	23	66	734	82
1904	651	46	234	261	18	86	912	64
1905	669	33	247	298	13	109	967	46

Year	Manitoba			Saskatchewan			Alberta			Totals	
	E	W	Stn	E	W	Stn	E	W	Stn	ETOT	WT
1906	699	33	271	307	15	113	48	2	27	1,049	50
1907	686	32	275	452	10	161	71	10	49	1,209	52
1908	685	20	282	508	8	176	109	6	59	1,302	34
1909	678	13	300	615	14	254	120	14	72	1,413	41
1910	696	11	312	835[2]	9	330	229	17	121	1,770	37
1911	707	12	329	904	5	374	249	13	130	1,860	30
1912	705	10	336	1,007	5	430	279	14	142	1,991	29
1913	698	10	338	1,246	6	513	321	19	168	2,265	35
1914	689	6	347	1,465	5	647	397	11	195	2,551	22
1915	678	8	348	1,619	5	653	449	14	219	2,747	27
1916	682	6	348	1,782	1	710	525	11	219	2,989	18
1917	672	0	352	1,945	0	732	670	0	285	3,287	0
1918	690	0	366	2,117	0	752	808[3]	0	304	3,615	0
1919	707	0	376	2,160	0	753	833	0	317	3,730	0
1920	695	0	379	2,165	0	753	853	0	334	3,789	0

Notes:
1. NWT = Northwest Territories, E = Elevators, W = Warehouses, Stn = Stations, ETOT = Elevator Total, WT = Warehouse Total
2. Saskatchewan had more elevators than Manitoba from 1910 on.
3. Alberta had more elevators than Manitoba from 1918 on.

Sources: 1884: Egan to Van Horne, 31 December 1884, CP Archives #8069; 1890 and 1896: *Second and Eighth Annual Reports of the Winnipeg Grain and Produce Exchange* (Winnipeg: WGPE, 1890, 1896); 1901–14: *The Canada Year Book 1913* (Ottawa: King's Printer, 1914), table 45, 429–31; 1915–18: *The Canada Year Book 1918* (Ottawa: King's Printer, 1919), sec. 9, table 32, 394–6; 1919–20: *1918–19, 1919–20, List of Licensed Elevators and Warehouses in the Western Grain Inspection Division* (Ottawa: Department of Trade and Commerce, 1919, 1920).

tion, and one spurred by the CPR's actions, was the creation of the Northern Elevator Company, organized by Nicholas Bawlf in 1893 (Table 14.2).[49]

Bawlf had entered the grain business immediately after coming to Winnipeg from Ontario, soon gaining the respect of his peers and becoming one of the key players in the grain trade.[50] The Northern Elevator Company was made up of most of the important private companies of the time,[51] and left only one other company owning more than five storage structures.[52] It soon developed and grew, and built on the older rail lines as well as the new branches. Although initially most dominant along the NP&M lines, by 1900 three-quarters of the Northern structures were along the CPR and its subsidiaries (Figure 14.9).

The Northern Elevator Company was followed by the short-lived Manitoba Grain Company (1897–98), the Dominion Elevator Company (1897), and Bready, Love, and Tryon (1898) (which became the Winnipeg Elevator Company in 1899) before the turn of the century.[53] In 1900 these three major line companies, along with the two major flour-milling concerns, owned nearly two-thirds of the grain storage facilities, and the ownership of Manitoban country elevators came to be dominated, as it had south of the border, by line elevator companies.

Other companies, such as Baker and Reid, W.L. Parrish, C.A. Young, and Young Brothers, were also assuming an important place in the industry and were to become more significant in future years. Because the next-largest elevator owner possessed only six structures, the farmers' fear of a monopolistic situation was perhaps even more real by this date.

Most of the elevators and warehouses of 1900 were located in Manitoba, and most of the owners still appear to have been Canadian.[54] However, two other provinces were soon carved out of the Northwest Territories, and both would outstrip Manitoba in a number of significant ways. The proportion of grain storage structures located in Manitoba had dropped between 1890 and 1900 (78 percent were now elevators), with the areas that were to become Saskatchewan and Alberta entering the picture (Table 14.3).

Notably also, although big corporate entities were dominating the

trade, the farmers were beginning to organize their resistance. In 1884 there had been two farmers' elevators and in 1890 only one. But by 1900 there were more than two dozen producer-owned elevators and warehouses. This was only a small proportion of the storage buildings, but the number was destined to grow.[55] The turn of the century marked another milestone in the grain trade. The farmers' influence was about to increase, but so was that of non-Canadian owners. Although Winnipeg would continue to be the centre of the grain trade, Manitoba was losing its preeminence in terms of grain elevators and railways.

Canadian Farmers Protest and the Government Responds

As the line elevator and milling companies grew, so did the conviction of many farmers that these groups were abusing their power and acting together to reduce true competition, especially when they were operating in concert with the CPR. Although it is difficult to find hard evidence of collusion, a system of agreements appears to have been in operation by the late 1890s, once again reflecting a situation in the United States.[56]

In time the province stepped in as a referee; the Manitoba Grain Act of 1900 (revised and amended at later dates) set up a series of rules and regulations to govern each stage of the marketing process. The core of this legislation was based upon grain laws of Wisconsin, Minnesota, and North Dakota, where farmers had experienced similar problems in earlier times.[57] Indeed, in many instances farmers experienced the same problems throughout the American Midwest.[58]

Despite this legislation, the farmers continued to suffer because the statute simply caused the elevator firms to "close ranks and combine more effectively for their own protection."[59] They did this by forming, in 1901, an organization called the North-West Elevator Association. This combine of companies "became known as 'the syndicate of syndicates' to grain growers from the banks of the Red River to the outspurs of the Rockies,"[60] and was closely linked to the Winnipeg Grain Exchange (known as the "House with Closed Shutters" by the farmers), which had been incorporated in 1891.[61]

This association controlled more than two-thirds of the elevators on the Prairies and, the farmers believed, operated as a monopoly to the detriment of producers. Through the association, the line elevator companies were able to collectively lower the price paid to the farmer for his grain, and when car shortages developed, as they did as early as 1901, the railways gave the elevator companies preference over farmers who wished to load their own cars or ship from flat warehouses. Other "ill practices" allegedly pursued by

Table 14.4 Elevators of Ogilvie and Lake of the Woods Milling Companies, 1884–1902

	Ogilvie			Lake of the Woods Milling		
Year	No. of Structures	% of Prairie Total	% of Prairie Capacity	No. of Structures	% of Prairie Total	% of Prairie Capacity
1884	20	29	38	0	0	0
1892	35	12	16	19	7	9
1902	59	10	12	50	8	10

Sources: 1884: Egan to Van Horne, 31 December 1884, CP Archives #8069; 1892: *Fourth Annual Report of the Winnipeg Grain and Produce Exchange* Winnipeg: WGPE, 1892); 1902: *The Commercial*, 1902, 474–6.

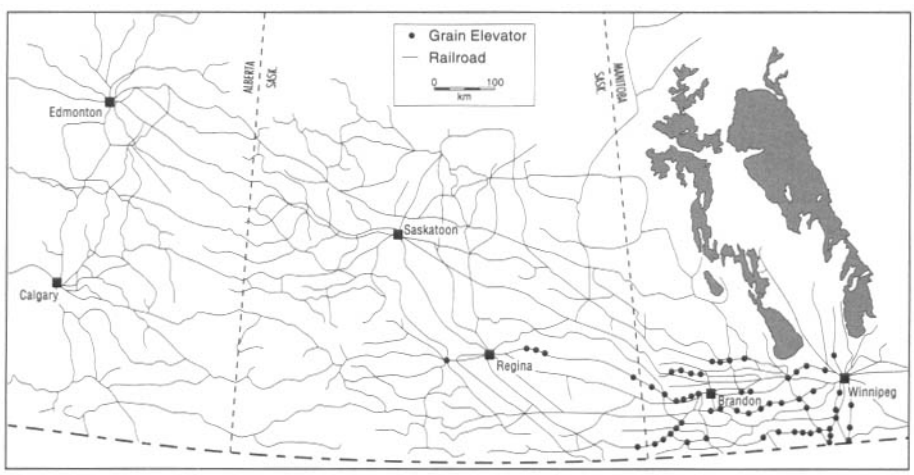

Figure 14.7 Distribution of Ogilvie Flour Mills Company Grain Elevators, 1902 (Source: Government of Canada data)

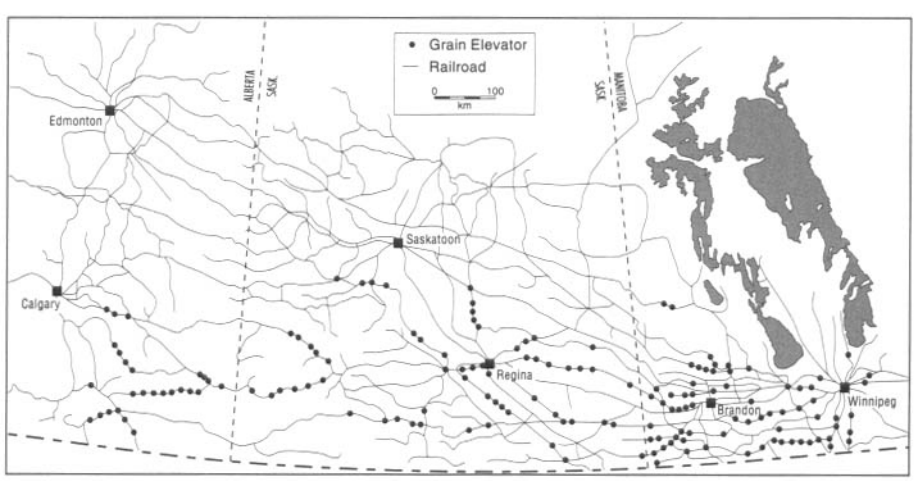

Figure 14.8 Distribution of Ogilvie Flour Mill Company Grain Elevators, 1920–21 (Source: Government of Canada data)

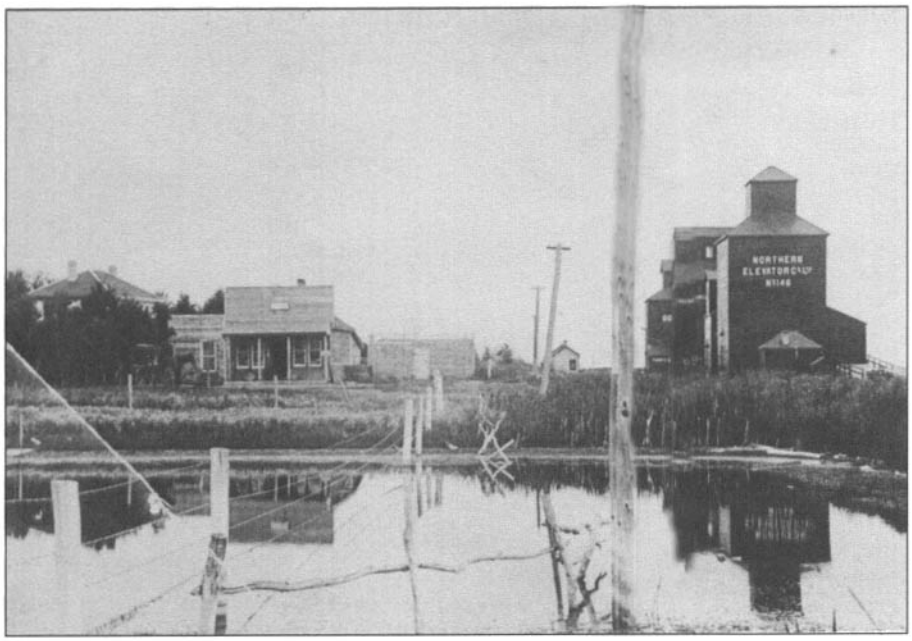

Figure 14.9 Northern Elevator Company Elevator, Pettapiece, Northwest of Brandon in the Early 1900s (Photographer unknown)

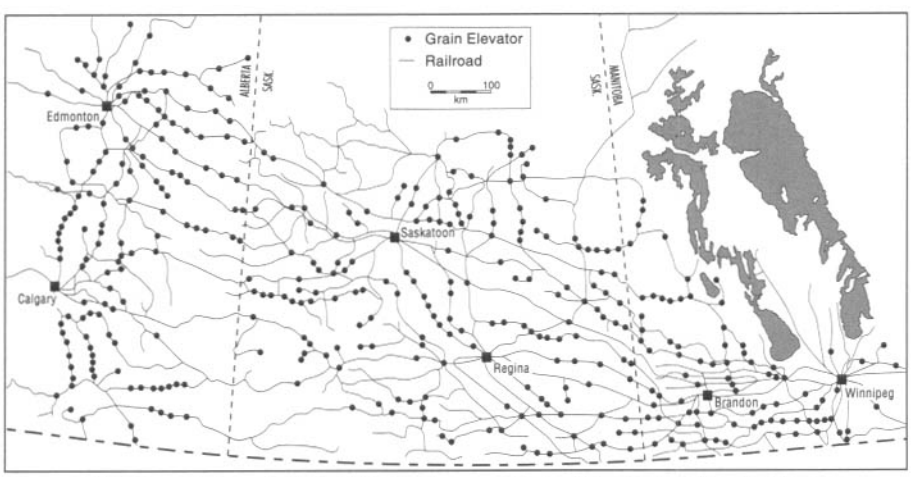

Figure 14.10 Distribution of United Grain Growers Grain Elevators, 1974–75 (Source: Government of Canada data)

the line elevator companies included "the taking of heavy dockage, the giving of light weight, misgrading the farmers' grain sold on street or graded into store, failure to provide cleaning apparatus, changing the identity of the farmers' special binned grain, declining to allot space for special binning and refusing to ship grain to owner's order, even when storage charges are tended."[62]

These problems meant that further government intervention was deemed necessary in later years, but they also led "to the beginnings of effective organization by prairies farmers and . . . [to] . . . the principal phases in the struggle for farmer-control of the western wheat trade,"[63] which culminated in the formation of the Winnipeg-based Grain Growers' Grain Company (GGG Co.), which formally opened its doors in 1906 and purchased a seat on the Winnipeg Grain Exchange.[64]

The GGG Co. was the first successful attempt organize farmers in Canada, although individual farmer-owned elevators had existed since at least 1884. There had been two earlier ventures on a national or near-national scale, but although both the Grange (introduced from Vermont in 1872), and the Patrons of Industry (crossing from Michigan in the early 1890s) achieved initial results, both of them weakened and failed. The Grain Growers' movement of the Prairies was Canadian-born and endured.[65]

The major elevator combines were not too happy with this form of farmer cooperation, however, as they had been criticized severely during the establishment of the GGG Co. by the farmers, who considered them a major reason for needing a cooperative company. The large firms "immediately declared war on the new farmers' company," but were unsuccessful in keeping the GGG Co. out of the industry.[66] The GGG Co. was greatly aided by the formation in 1910 of the Manitoba Elevator Commission (MEC). The second government-owned utility in the province, the MEC was designed to compete with the established line elevators, which were in the hands of private interests. It bought and/or built 174 elevators in the province in 1910, and immediately became the largest elevator owner in Manitoba (Table 14.2).[67]

The formation of the MEC can be seen as the result of a complex political and philosophical process that affected many aspects of Canadian life in the early 20th century — although in this particular instance the government's decision in favour of public ownership appeared to be based as much on pragmatic as on philosophical grounds. The MEC was significant, however, as it provided an initial model for the nonprivate ownership of grain elevators that was of considerable educational value to the other Prairie provincial governments as well as the various farmer-owned organizations that soon dominated the Canadian grain trade.[68] It was also important as its system of elevators was soon leased to the GGG Co. Today, the contemporary incarnation of this firm, the United Grain Growers (UGG), is the third-largest elevator company in Canada, following the producer-owned pools in Saskatchewan and Alberta (Figure 14.10).[69]

The Complexion of the Trade Changes

Statistical data for the years between 1900 and 1911 are sketchier, but some major characteristics of

the evolution of the grain trade can still be seen. After 1900 a new wave of elevator construction followed the building of the Canadian Northern Railway, and by 1906 the complexion of the industry had changed.

First, the area of settlement was substantially altered, with rail lines being completed north of Riding Mountain. Second, other CNor lines to a variety of southern Manitoban locations, including Brandon and Virden (1905), created more competition for the CPR,[70] as did the construction of some James J. Hill–controlled Great Northern branch lines (by 1906) and a new main line, the Grand Trunk Pacific Railway, built through Manitoba by 1909 (Figure 14.2 and Table 14.5).[71] These changes allowed the total amount of grain grown to increase, and thus the number of elevators and elevator companies to multiply (Table 14.3).[72] Third, and arguably most important, the national complexion of the trade had changed, and this helped provide the capital and expertise to quickly develop new regions.[73]

The number of American members of the Winnipeg Grain and Produce Exchange jumped from perhaps 4 in 1900 to 19 in 1903, and the total fluctuated around this mark in succeeding years.[74] Reputedly, the grain exchange by 1906 was "dominated largely by the big elevator companies, most of which were owned and controlled by American grain interests."[75] Although this was probably an overstatement, these "Minnesota Grain Men" were very dominant, had brought much-needed capital and expertise, and were backed up by at least four private wires from the Minneapolis exchange to Winnipeg. In addition, several Chicago and Minneapolis commission houses had representatives and offices in the Manitoba capital[76] and "appointed buyers in every railroad town."[77] Their impact is indicated by the fact that in 1907 William J. Bettingen was elected the first American president of the Winnipeg Grain and Produce Exchange.[78]

The Americans had come to Canada largely as a result of the activities of the railway owners, who wanted men with capital and experience to rapidly construct lines of elevators on the new railway tracks,[79] but also because they believed that "the greatest opportunity for the grain trade lay in the Canadian west."[80] When they arrived, however, they found that the elevator landscape in Manitoba was largely complete. Between 1900 and 1911 the number of elevators in the province increased steadily, but after that there was little change (Table 14.3). Consequently the American entrepreneurs had two major options: buy established line companies and/or open up new lines in virgin territory, particularly in Saskatchewan and later Alberta. The latter was, of course, favoured by the railway magnates, who were eager to see new elevators in the areas tributary to their tracks.

Since 1896 William Mackenzie and Donald Mann, the men behind the Canadian Northern Railway, had followed the CPR's lead and aggressively sought investment in elevator construction.[81] In the early 1900s, they approached, among others, the Peavey and Searle interests in Minneapolis and a consortium including the Douglas Brothers of Cedar Rapids, Iowa, Robert Stuart of Chicago, and G.F. Piper of Minneapolis.[82]

Bargaining between the Canadian and American groups began in 1902, and at that time the Piper-Douglas consortium was apparently also acting in concert with the Peavey company. CNor placed a

Table 14.5 Miles of Prairie Railroad Track, 1894–1920

Year	Man[2]	Sas[3]	Alb[4]		Can[5]
1894	1,471		1,772	(4 NWT)[6]	15,627
1895	1,472		1,772	"	15,977
1896	1,474		1,780	"	16,270
1897	1,575		1,780	"	16,550
1898	1,621		1,778	"	16,870
1899	1,603		1,930	"	17,250
1900	1,815		1,901	"	17,657
1901	2,056		2,085	"	18,140
1902	2,128		2,080	(NWT + YUK)[7]	18,714
1903	2,225		2,094	"	18,988
1904	2,364		2,200	"	19,431
1905	n/a[8]	n/a	n/a		20,487
1906	2,780	1,951	1,235		21,429
1907	3,074	2,025	1,323		22,452
1908	3,111	2,081	1,323		22,966
1909	3,205	2,631	1,322		24,104
1910	3,221	2,932	1,488		24,731
1911	3,466	3,121	1,494		25,400
1912	3,520	3,754[9]	1,897		26,727
1913	3,993	4,651	2,212		29,304
1914	4,076	5,089	2,545		30,795
1915	4,498	5,327	3,174		35,582
1916	4,309	5,378	3,894		37,434
1917	4,194	6,124	4,444[10]		38,604
1918	4,168	6,162	4,273		38,879
1920	4,404	6,220	4,474		39,058

Notes:
1. Earlier data unavailable.
2. Manitoba.
3. Saskatchewan.
4. Alberta.
5. Canadian total railway mileage in operation.
6. Four Northwest Territories.
7. Northwest Territories and Yukon Territory.
8. Not available.
9. Saskatchewan had greater railway mileage than Manitoba from 1912.
10. Alberta had greater railway mileage than Manitoba from 1917.

Sources: 1894–1904: *The Statistical Year Book of Canada* (Ottawa: Department of Agriculture, various years); 1905–20: *The Canada Year Book* (Ottawa: Dominion Bureau of Statistics, various years), table 1, Record of steam mileage.

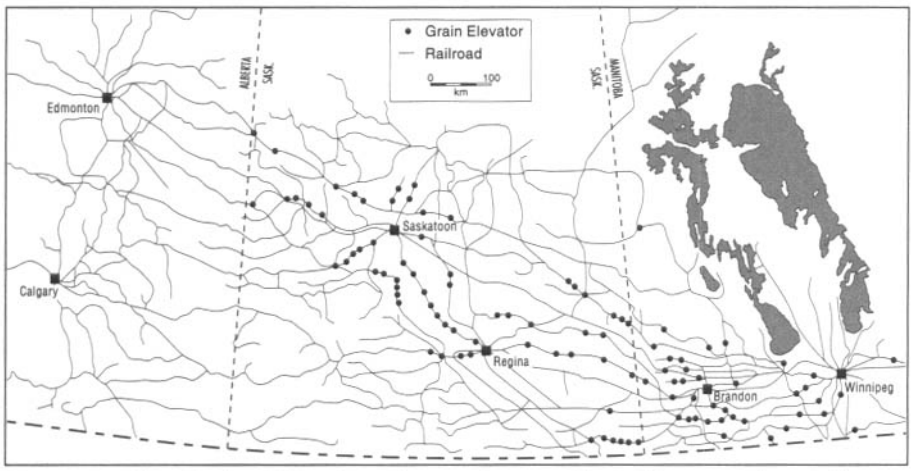

Figure 14.11 Distribution of Canadian Elevator Company Grain Elevators, 1911–12 (Source: Government of Canada data)

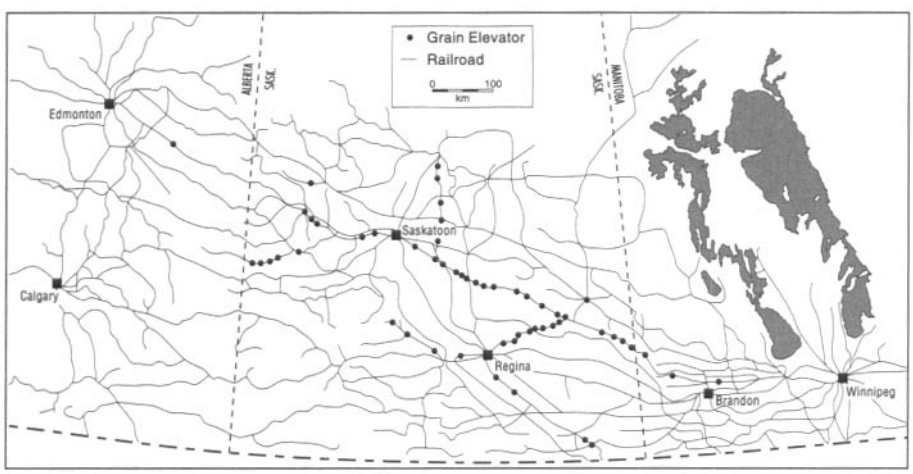

Figure 14.12 Distribution of Atlas Elevator Company Grain Elevators, 1918–19 (Source: Government of Canada data)

special railroad car at the disposal of Frank T. Heffelfinger and Frederick D. Wells, sons-in-law of Frank Peavey, so that they could tour potential elevator sites. In May 1902, however, the Peavey Company dropped out of the picture, "deciding that this would not be an opportune time for us to enter the elevator business along the line of The Canadian Northern Railway in Canada,"[83] apparently because there was no grain futures market in Canada then.[84]

The Piper-Douglas consortium also toured the CNor lines in order to select good points for elevators and land for their land company. Although these American capitalists did not expect exclusive rights at elevator points, they did anticipate receiving "the choicest locations, no matter to whom the sites had been promised."[85] Sites had already been promised to other "parties, representing American capital," by the CNor General Superintendent, but he was overruled so that the Canadian Elevator Company (CEC), which was partly owned by Piper-Douglas, could be accommodated "in every reasonable way, as it will have a very complete system of elevators on our line including terminal elevators at Port Arthur."[86]

The CEC promised to quickly build some 30 elevators on CNor lines, with each elevator having a capacity of 30,000 bushels and costing $6,000 — a total expenditure of $180,000. At the urging of its vice president, the CEC soon also built elevators on CPR lines. William Henry McWilliams felt that the building of elevators on the CPR "would make our position in the grain trade a little stronger, and assist us in getting materials off that road for elevator construction."[87] The CPR had apparently been refusing to carry materials for use in elevator construction along the CNor lines, and McWilliams felt that he could make the CPR officials more agreeable if elevators were also built on CPR lines. Lumber businesses and coal and wood operations were associated with selected elevator points, in order to utilize more fully employees' working time on a year-round basis and thus maximize profits.[88]

The Canadian Elevator Company became the largest line company in Canada by 1911 (Table 14.2 and Figure 14.11), although it operated only about one-third of its elevators in Manitoba at that date (and only a quarter in 1928, when it merged with the Dominion Elevator Company). The settlement frontier had rapidly moved westward to Saskatchewan and Alberta,[89] a process that was aided by the opening of the Panama Canal in 1914.

Although relatively little wheat was exported through Canada's Pacific ports until the 1920s, this new outlet further stimulated growth in Alberta and Saskatchewan and made the overall production system more efficient. Less than 20 percent of the wheat exported from Canadian ports left via Pacific ports before the 1920s, but over 30 percent then became common in the early to mid-1920s, and over 40 percent was usual thereafter.[90]

After a number of amalgamations, the Canadian Elevator Company grew at a relatively reduced scale until 1959, when it was sold to the United Grain Growers. Piper and Douglas were later involved with the Atlas Elevator Company, which operated on Grand Trunk Pacific lines across the Prairies (Figure 14.12).[91]

Although the Peavey Company dropped out of the picture in 1902, it soon reevaluated its position and was again courted by the CNor within a few years. In 1906, when Canada had "established a market that made it possible to hedge grain," Heffelfinger and Wells "leased the huge [Canadian Northern–owned] grain terminal at Port Arthur, and signed a contract to build 50 elevators" along the CNor

railway.[92] This was the beginning of the British America Elevator Company, which had 18 percent of its elevators in Manitoba in 1911 (Figure 14.6).[93] Like the Searle Grain Company, it operated on CNor lines and was thus more visible — indeed, dominant — in the more northerly areas of Manitoban settlement (Figure 14.13).

In 1909 Peavey interests formed the National Elevator Company to operate on CP lines, although it soon also built along the CNor. Once again most of this growth took place outside Manitoba. "The Peavey group also acquired six other companies which were eventually consolidated into the National Grain Company Ltd. in 1940."[94] These acquisitions included the Northern Elevator Company, the first private Prairie line elevator company, founded by Nicholas Bawlf in 1893. When it was acquired by Peavey in 1909, it was the third-largest line elevator company in the Prairies (excluding that owned by Ogilvie Flour Mills),[95] following the British America Elevator Company and the Canadian Elevator Company (Table 14.2). The acquisition gave Peavey an important and immediate inroad into the Manitoba market, as this was the largest elevator company in the province at that time (excluding the flour milling enterprises).

The Searle story is similar to that of Peavey. This Minneapolis grain family was involved in a variety of companies, which were largely consolidated into Searle Grain in 1928.[96] Augustus L. Searle had had a seat on the Winnipeg Grain Exchange for some time, and there was clearly a close working relationship between the Searle and Peavey groups in Canada. The Canadian operations of the Searle grain organization ultimately surpassed in size the firm's American operations, and the head of the Canadian branch, living in Winnipeg, became president of the American branch as well.[97]

Other smaller companies — such as the Royal Elevator Company, Norris Grain, the Imperial Elevator and Lumber Company, and North Star Grain — were also begun or operated by entrepreneurs from the United States. The Prairie grain trade was clearly seen as a new frontier by the Americans, and there is considerable evidence that they and some of their Canadian counterparts acted not as individuals so much as cogs in a machine that farmers disparagingly termed the "Grain Trade."[98]

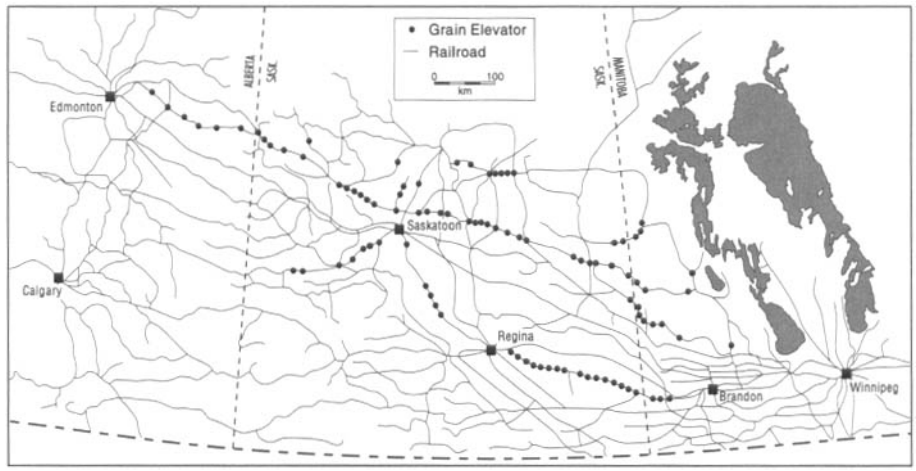

Figure 14.13 Distribution of British America Company Grain Elevators, 1911–12 (Source: Government of Canada data)

Although in 1900 the Canadian grain trade was, as far as can be ascertained, essentially 100 percent Canadian-owned and operated, the situation soon changed. By 1911–12, American entrepreneurs had large or controlling interests in at least 26 of the 52 largest elevator-owning companies, which owned over 40 percent of the elevators on the Prairies.

In Manitoba the proportion was smaller because of the reduced opportunities for growth. In 1911 only about one-third of privately owned elevators in this province were under American ownership, and only a quarter of the structures on the older, more southerly CPR lines were controlled by American interests. In contrast, all but one of the elevators on the Great Northern branch lines, over half of those on the GTP, and 44 percent of those on Canadian Northern were owned by companies from south of the 49th parallel.

The situation elsewhere on the Prairies was noticeably different. By 1910–11 Saskatchewan had the largest number of elevators (Table 14.3). A conservative estimate is that over 40 percent of these were American-owned in 1911, along with almost half of those in Alberta.[99] The disparity between the provinces in elevator numbers continued to increase (Table 14.3). By 1933, when the number of elevators reached its peak at 5,750, Saskatchewan had nearly 57 percent of the total, Alberta almost 31 percent, and Manitoba less than 13 percent.

After 1911 the influx of American grain traders slowed to a stop — in much the same way that the movement of farmers across the border diminished — although there does not seem to have been any significant reverse migration of these entrepreneurs. There was no major new American ownership of elevator operations after 1911, although Americans already present continued to be involved in the formation of new companies and the amalgamation and takeover of old ones. By 1917 three more American companies had been formed but two others had disappeared, and this pattern continued over the next few years.

American ownership increased to a thousand elevators by 1917 and surpassed this figure by 1921, but this represented under one-third of the total. Canadians continued to increase in importance. The major flour milling lines had always been domestically dominated (Ogilvie and LofW had been joined by Western Canada Flour Mills and Maple Leaf Milling by 1911) (Table 14.6), and other elevator companies became increasingly dominated by Canadian interests.

The rise of farmer-owned companies changed the complexion of elevator operations forever. By 1921

Table 14.6 Licensed Elevator Ownership: Manitoba Milling Companies[1]

Year	Ogilvie	LofW[2]	WCFM[2]	Maple Leaf
1884	12	-	-	-
1890	28	7	-	-
1900	45	48	-	-
1911	118	88	79	46
1920	170	116	96	38[3]
1928	161	114	85	54
1932	149	105	85	-
1938	146	87	75	4

Notes:
1. Excluding flat warehouses.
2. For full names, see text.
3. Many Maple Leaf elevators were unlicensed in 1920. The company owned about 60 elevators at this time.

Sources: 1884: Egan to Van Horne, 31 December 1884, CP Archives #8069; 1890 and 1900: *Second* and *Twelfth Annual Reports of the Winnipeg Grain and Produce Exchange* (Winnipeg: WGPE, 1890 and 1900); 1911–12: *List of Licensed Elevators in the Manitoba Grain Inspection Division* (Ottawa: Department of Trade and Commerce, 1912); 1920–21, 1938–39: *List of Licensed Elevators and Warehouses in the Western Grain Inspection Division* (Ottawa: Department of Trade and Commerce, various dates).

they were becoming dominant; by 1929 the three provincial pools and the United Grain Growers owned over one-third of the Prairie elevators, and their presence triggered a round of amalgamations in the private trade.[100]

As the trade matured during the second and third decades of the century, the character of ownership changed. More companies had a mixture of Canadian and non-Canadian owners, often resulting in a gradual loss of the original family concept of ownership. In addition, many Americans took out British citizenship, further muddying the waters.

For instance, J.C. Gage, an American born in Minneapolis in 1876, emigrated to Canada in 1903 and eventually became a naturalized citizen. At the time of his death in 1930, he was president of both the Alberta Pacific and Federal Grain companies — then the two largest private companies. Both had originally been Canadian. Gage, however, had previously been president of the International Elevator Company, an American outfit, which became part of Federal Grain as a result of a major amalgamation in 1929.

The Searles, McCabes, and other American families also became "Canadianized," and some lost touch with their roots south of the border. Thus the Prairie grain trade once again became increasingly domestically owned and lost many of its direct linkages with the United States.

The grain trade entrepreneurs also became integrated into the wider Winnipeg business community, resulting in an intertwining of control of banks, elevator companies, railroads, and other major institutions. This was characteristic of the grain-handling system in both the Canadian Prairies and the United States. In time, Americans in Canada also became part of this system.

Thus Stewart Searle, the only son of A.L. Searle, was on the boards of the Royal Bank, the Hudson's Bay Company, and Monarch Life. Toronto-born N.L. Leach, who got his early training in Duluth and married Rosabelle Searle (a daughter of A.L. Searle), was a director of the Royal Bank, and A. Searle Leach, his son, was a director of the Bank of Montreal. Even some owners of the smaller companies followed a similar path, with William Leistikow of the Imperial Elevator and Lumber Company becoming a director of the Northern Crown Bank. There are many other examples, but only one more will be used as an illustration.

By 1911, the McCabe Brothers Grain Company had a line of elevators on Great Northern track in Manitoba, apparently paid for by the railway company, which was quite adept at making such deals if they were clearly in its own interest.[101] In fact, the McCabes owned all but one of the elevators on Great Northern's Manitoba lines until the early 1930s, and all of them from then until the mid-1930s, when the last of these branch lines was removed (providing some of the earliest examples of branch line abandonment on the Prairies). Some of the grain collected on these lines was sent (bonded) to Duluth for later export via ports on the east coast. Both McCabe Brothers and Great Northern were originally centred in the Minneapolis--St. Paul area and had had various dealings with each other before the Manitoba venture.

The Advent of the Pools

The success of the United Grain Growers and the Saskatchewan Co-operative Elevator Company[102] was a major triumph for the farmers' movement as it made the market system fairer and more competitive in both handling and selling activities, but it did not solve all the producers' problems. However, the farmers' companies were dominant enough by the early interwar years to be able to "set the pattern of elevator services and of price relationships which would be most acceptable to the grower owners."[103] These companies were by no means revolutionary in an economic sense, and operated within the open-market system using the principles of the free market.

Despite the flirtation with government *ownership* in Manitoba (through the Manitoba Elevator Commission), government *regulation* became the rule. This practice was hastened by wartime attempts to regulate disturbed channels of grain movements. It involved the Board of Grain Supervisors, which was set up in Canada in 1917 to control the distribution and price of Canadian wheat after the suspension of the open market. This was followed by the Canadian Wheat Board of 1919, which became the exclusive marketing agency for Canadian wheat in home and export markets. But the private trade did not want such a degree of regulation

Table 14.7 Farmer Ownership of Elevators, 1900–90

Year	Farmer-Owned	MEC[1]	UGG[1]	Manitoba Pool	Sask. Pool	Alberta Pool
1900	26	0	0	0	0	0
1911–12	22	170	0	0	0	0
1924–25	0	0	347	0	433[2]	0
1928–29	0	0	417	145	930	307
1932–33	0	0	435	154	1,069	441
1943–44	0	0	518	209	1,091	437
1952–53	0	0	606	257	1,157	486
1960–62	0	0	778	355	1,259	567
1970–71	0	0	817	325	1,229	518
1980–81	0	0	584	224	1,059	670
1989–90	0	0	291	143	490	276

Notes:
1. For full names, see text.
2. Owned by Saskatchewan Co-operative Elevator Company in 1924–25, but soon to be taken over by the Saskatchewan Pool.

Sources: 1900: *Twelfth Annual Report of the Winnipeg Grain and Produce Exchange* (Winnipeg: WGPE, 1900); 1911–12: *List of Licensed Elevators in the Manitoba Grain Inspection Division* (Ottawa: Department of Trade and Commerce, 1912); 1924–25, 1928–29: *List of Licensed Elevators and Warehouses in the Western Grain Inspection Division* (Ottawa: Department of Trade and Commerce, 1925, 1929); 1932–33, 1943–44, 1952–53: *List of Grain Elevators in the Western and Eastern Grain Inspection Divisions* (Ottawa: Department of Trade and Commerce, 1933, 1944, 1953); 1960–61, 1970–71, 1980–81, 1989–90: *Grain Elevators in Canada* (Ottawa: Ministry of Supply and Services, 1961, 1971, 1981, 1990).

and neither did the postwar Canadian government. The wheat board was ended in 1920, restoring the wheat trade to private hands and reestablishing the open market.

Wheat prices collapsed dramatically in 1920, however, and another decade of farmer protest began, aimed at destroying the private trade and its symbol, the Winnipeg Grain Exchange. The exchange was firmly in the sights of the farmers for a number of reasons, but in the early 1920s the issue was the question of the futures market, which was seen as a means of speculating on prices — to the detriment of the farmer — rather than as a way of producing a steady market for grain throughout the year.

Attempts to eliminate the futures market and restore government marketing of wheat were unsuccessful, however, and so the farmers turned to their next alternative — the pool. This had proven successful in parts of the United States (again the area where both problems and solutions for the Canadian grain trade originated), and was founded on cooperative principles that fitted well with the Prairie philosophy. "The selling of the pool idea was helped by the persuasive oratory of Aaron Sapiro, a California marketing expert who travelled through the Prairie provinces in 1923, speaking at pool meetings."[104]

Under the pooling system, the crop, using a signed-contract system, would be marketed by the producers, with net returns going to the farmers. Thus it dealt with the export (spot) price rather than the spreads between street, track, and spot prices, which were a function of farmer-owned elevators. The pool system was meant to lead to orderly marketing, to eliminate middlemen and speculators, and to increase farmer profits.

In 1923 the Alberta Co-operative Wheat Producers Ltd. was organized and began accepting deliveries. This was followed in 1924 by the formation of the Saskatchewan and Manitoba pool organizations. In 1923–24, the three pools organized the Canadian Co-operative Wheat Producers Ltd. as a central selling agency to market their wheat through the Winnipeg Grain Exchange.

During the 1920s the pool concept was somewhat successful, but it collapsed with the economy in 1929–31, when wheat could not be sold at prices that the farmers had been guaranteed. In 1931 the government liquidated the pool as a wheat-selling operation, leaving the farmers to campaign once again for a government-controlled wheat marketing board, which was finally instituted in 1935 after a tremendous amount of suffering on the part of the farmers. The Canadian Wheat Board of 1935 was formed as an emergency measure to liquidate surplus wheat stocks, but "conditions gave the Board a permanency which many farmers sought and which both the private grain trade and the government opposed."[105]

The Canadian Wheat Board's scope and responsibilities continued to grow, and by 1945 "the marketing functions, which previously rested with the elevator companies, were transferred to the Board. The elevator companies became handling and warehousing operations with revenues accruing on a fee-for-service basis. These developments were viewed with mixed reactions, with the cooperatives fully supporting the role of the Canadian Wheat Board and the private trade opposing."[106] Such changes helped to spur more amalgamations within the private trade.

More relevant to the present discussion, the farmers' successful attempts in the early 1920s to set up a pooling system also led them to enter the grain trade as elevator companies, and these remained in place after the wheat pool was dissolved. They enabled the farmer organizations to control the "grain from the time it left the farmer's wagon."[107] Significantly, however, the elevator system was maintained (albeit with a different pattern of ownership),

and thus the manner in which grain was handled did not change.

Regional differences led to three companies being set up, one in each province. These were instituted in addition to the UGG network, as the operations of this company were felt to be philosophically at odds with the ideals of other Prairie farmers. Initially the provincial pools operated at a much smaller scale than in the 1920s, but they eventually made a strong recovery and added greatly to their elevator capacity (Table 14.7).

In Saskatchewan the pool set up in 1924 incorporated Saskatchewan Pool Elevators Ltd. in 1925, and successfully bought out the Saskatchewan Co-operative Elevator Company.[108] The pool had also built its own elevators in a concerted construction process, making it by far the largest Prairie elevator-owning company, with 20 percent of the overall total by 1929.

In Manitoba and Alberta the pools set up in 1924 and 1923, respectively, incorporated separate companies to acquire elevator facilities. In Manitoba, Manitoba Pool Elevators Ltd. (a subsidiary of Manitoba Co-operative Wheat Producers Ltd.) applied for charters for elevators at points where sufficient support existed. A local advisory board was set up to keep in touch with local conditions, although head office managed the facility.[109] In Manitoba the pool competed with the UGG, but in Alberta and Saskatchewan there was a policy to avoid building at competing points.

In 1926 the three pools discussed with the UGG the sale of the latter's elevators, but the annual meeting voted against such a sale. The pattern continued, although there was often cooperation among the four farmer-owned companies. The UGG decision to remain independent reflected in part philosophical variations in the kind of cooperativism involved, which included the method of administering "locals" and the presence in the UGG of a share and dividend system. More practically it reflected the fact that the UGG bought wheat from members and nonmembers (whereas the pools bought only from farmers who signed contracts with them), and the UGG did not want to return some of its customers to the clutches of the line elevator companies.

As the Alberta and Manitoba organizations did not buy the elevators of an established company, their growth was slower (Table 14.7). In 1926–27 the Manitoba pool had 40 structures, but this number increased steadily. In addition, by 1930 the pools had 12 terminal elevators (mostly at the Lakehead). Although they purchased some elevators, they increased their market share mostly by constructing their own houses.

In later years, when some of the more established companies decided to sell their elevators, the provincial pools got into the market. Thus Manitoba Pool Elevators, in concert with those in the other Prairie provinces, bought elevators from Western Canada Flour Mills in 1940, Reliance (and Alliance) Grain in 1948, Ogilvie Flour Mills and the Lake of the Woods Milling Company in 1959, Federal Grain in 1972, and the Scottish Cooperative Wholesale Society Ltd. in 1973. In recent years they have actively traded elevators with the UGG and private companies such as N.M. Paterson and Sons Ltd. These "saw-offs" have become more noticeable in recent years, but have been a feature of the trade since at least the late 1940s.

More Recent Changes

During the 1920s and 1940s up to the present, amalgamation of many companies took place. In 1921, 67 major elevator companies controlled 89 percent of the 3,789 elevators; in 1929 there were still 62, now controlling 96 percent of the total of 5,155. A spate of amalgamations took place, with 9 companies combining into Federal Grain in 1929 and 6 merging as Searle Grain in 1928. The latter was simply the result of a declining economy leading to the reorganization of a number of companies that had been under one family's ownership for some time. This situation also occurred with the formation of McCabe Grain (1929), National Grain (1940), and Reliance Grain (1936).

Other companies sold out to larger competitors and helped fuel the rise of Pioneer Grain, the United Grain Growers, Alberta Pacific Grain, and the pools. Only one important company was formed after 1930, and by 1933 only 37 of the major companies remained. By 1943 there were 27; by 1953, 22; and by 1961, only 13.

By 1960–61 elevator numbers were falling as a rationalization of the system took place (Table 14.8). In 1968 the McCabe family sold its company to the UGG. In 1972 Federal Grain, which had been formally amalgamated with the Searle and Alberta Pacific interests in 1967 to form the largest-ever private company, sold out to the three pools. In the same year, Inter Ocean Grain sold its elevators to Pioneer, and in 1973 the Scottish Cooperative Wholesale Society sold its structures to Manitoba Pool Elevators.

By this time all the smaller American-owned companies had been swallowed up by other groups, except the remaining Peavey interests and the comparatively small Ellison Milling Company. The former, as the National Grain Company Ltd., were sold to Cargill Grain Company Ltd. in 1974 (which remains the predominant American influence on the Canadian Prairies), and the latter was purchased by Parrish and Heimbecker in 1975.[110] Only N.M. Paterson and Sons Ltd. remained relatively untouched by these changes (Case Study 14.1 on page 216). By 1980 only 3,324 elevators were still licensed, and today the eight major companies still operating Prairie country elevators own 99 percent of the 1,600 structures that remain.

Changes also took place in the elevators themselves, although the basic concept (the elevation of the grain, allowing it to flow to bins and grain cars using gravity, much like a liquid) remained the same and many older elevators remain in use. Computerization has become widespread, enabling better management of individual elevators as well as elevator lines. Elevators have increased greatly in size, and "inland terminals" are even larger.

Although now measured in tonnes rather than bushels, the "prairie sentinel" may now have a capacity of over 200,000 bushels

(5,680 tonnes) — eight times that of its ancestors. A UGG elevator in Dauphin has a capacity of 6,500 tonnes, and the same town has an 8,840-tonne-capacity Cargill structure and two pool houses that can hold a total of 12,740 tonnes. The inland terminal at Elm Creek holds over 18,000 tonnes. The provincial average is nearly 4,500 tonnes (around 160,000 bushels).

Many elevators are now located outside the town or village limits, as there is no longer enough room to accommodate these behemoths (some with sidings for 50-car "spots" and 20-car "spots," which are regarded as essential for efficient operation), along with the new-style grain cars and the huge contemporary farm trucks, within settlements designed for the horse-and-cart age. Taxes and land prices may also be lower outside settlement limits.

Styles are also somewhat different, as technology has improved and cost-sharing has become increasingly important. Thus the closed-in cupola has now been commonly replaced by an exposed grain machinery network on the head of the elevator (reducing the danger of fire and other problems), and concrete structures are becoming more widespread. Concrete has long been a feature in the United States but was slow to catch on here. Wood was preferred, and concrete was felt to be more vulnerable to grain dust explosions although less susceptible to fire. Although the pool has adopted many of these new design features, Cargill has claimed to be the source of many of these innovations.

Table 14.8 Stations and Elevators on the Prairies, 1920–89

Year	Number of Stations	Number of Elevators	Average Elevator Capacity (bushels)
1920	1,506	3,789	34,049
1930	2,038	5,724	33,716
1933	2,099	5,758	33,475
1935	2,162	5,715	33,152
1940	2,154	5,647	35,484
1952	2,090	5,403	
1960	2,071	5,338	
1970	1,908	4,947	80,215
1981	1,240	3,117	96,305
1987	1,066	1,790	162,000
1988	1,050	1,705	4,312[1]
1989	997	1,619	4,400[1]

Note:
1. Tonnes

Sources: 1920–21: *List of Licensed Elevators and Warehouses in the Western Grain Inspection Division* (Ottawa: Department of Trade and Commerce, 1921); 1930–31, 1933–34, 1935–36, 1940–41, 1952–53: *List of Grain Elevators in the Western and Eastern Grain Inspection Divisions* (Ottawa: Department of Trade and Commerce, various dates); 1960–61, 1970–71, 1981–82, 1989–90: *Grain Elevators in Canada* (Ottawa: Ministry of Supply and Services, various years).

CONCLUSION

The development of the grain trade on the Prairies in general, and in Manitoba in particular, has been spectacular and exciting. It has transformed an area of sparse permanent settlement into a series of permanent cultural landscapes. It helped establish or consolidate Winnipeg and other major urban centres in the region, and often created, or at least strongly influenced, the social and economic orders of these central places.

The growth of the grain trade has been characterized by constant change, but interestingly it can also be argued that the more things have changed, the more they have stayed the same. Manitoba is still economically dominated by, and is still in many ways a colony of, eastern Canada. In addition, the "continuity of the problems of farmers in Manitoba is striking: orderly marketing, freight rates, branch railway lines, elevator facilities, the maximum use of the port of Churchill and the Hudson Bay Railway all remain subjects of debate today" — just as they were at the beginning of this century.[111]

Although wheat is perhaps no longer so obviously the economic king of the region, it and its fellow grain crops are still dominant. "In 1981–82 the Prairie provinces accounted for 96 percent of Canadian wheat production and 65 percent of total coarse grain production."[112] Perhaps the major change in the last seven decades has been in the companies that have controlled the trade. In 1921 there were 67 major elevator-owning companies on the Prairies — mostly headquartered in the grain exchange building in Winnipeg. In 1991 there were 8 (still mostly Winnipeg-based), and their elevator numbers, only 30 percent of the 1930s peak, may well drop by half over the next decade as the Canadian grain trade struggles to solve the problems of competition in the world system.

Other potential changes that may drastically modify the grain trade and lead to a revolution in grain handling include the reorganization of regional agricultural practices following the end of the Crow rate; shipping through the United States (perhaps down the Mississippi and/or using long-distance trucking) as a consequence of the North American Free Trade Agreement (NAFTA); and the rise of Asian markets. These developments may contribute to the possible end of Churchill's function as a grain-shipping port (see Case Study 12.1 on page 172), and even the decline of the Lakehead as the centre of the grain trade.

Symptomatic of these changes is a much looser association with what has become the *Commodity* Exchange, and a much greater dependence upon government intervention. In the early 1920s farmer ownership was still relatively unimportant in terms of elevator numbers — the UGG owned, for instance, only 8 percent of the total number of elevators. But in the early 1990s

farmer ownership is the norm, with nearly 80 percent of country elevators being in the producers' hands. By the late 19th century, the visible symbol of the grain trade was the private line elevator. Today the symbolic significance of the elevator is arguably still intact, but this elevator would be one belonging to a Pool or to the United Grain Growers.

ACKNOWLEDGEMENTS

I would like to thank Donna Everitt, Roberta Kempthorne, Marilyn Kinnear, and Victoria Stevenson, who aided in data collection for this chapter. The cooperation of the staffs of the Public Archives of Canada, the Provincial Archives of Manitoba, the Manitoba Legislative Archives, the Historic Resources Branch (Province of Manitoba), and the Glenbow Archives is also acknowledged. Lastly, thanks to the Brandon University Research Committee, the Canadian Plains Research Center, the Historical Atlas of Canada Project, and the Manitoba Heritage Federation for research funds that aided in the data collection process.

NOTES

1. C.F. Wilson, *A Century of Canadian Grain: Government Policy to 1951* (Saskatoon: Western Producer Prairie Books, 1978), 1.
2. P.J. Hugill and J.C. Everitt, "Macro-Landscapes: The Cultural Landscape Revised by World-System Theory," in *Person, Place and Thing: Interpretive and Empirical Essays,* Geoscience and Man Series, ed. S.T. Wong (Baton Rouge: Louisiana State University, 1992), 177–94; see also V.C. Fowke, *The National Policy and the Wheat Economy* (Toronto: University of Toronto Press, 1957).
3. W.L. Morton, *Manitoba: A History,* 2nd ed. (Toronto: University of Toronto Press, 1967), 199.
4. The leading producers of wheat in 1991 were the former USSR, China, India, and the United States. The leading exporter is the United States. *FAO Yearbook: Production,* Vol. 45, 1991 (Rome: Food and Agriculture Organization, 1992).
5. G. Friesen, *The Canadian Prairies: A History* (Toronto: University of Toronto Press, 1984), 301, 329.
6. W.T. Easterbrook and H.G.J. Aitken, *Canadian Economic History* (Toronto: Macmillan of Canada, 1956), 476.
7. F.L. Dickinson, *Prairie Wheat: Three Centuries of Wheat Varieties in Western Canada* (Winnipeg: Canada Grains Council, n.d.), 1; C.W. Anderson, "Grain: Pioneer Merchants Established Winnipeg as a Major Canadian Commercial Centre," *The Beaver* 66, 5(October-November 1986):33–42.
8. D.A. MacGibbon, *The Canadian Grain Trade* (Toronto: Macmillan of Canada, 1932), 25.
9. Winnipeg Grain Exchange, *The Grain Trade in Western Canada* (Winnipeg: Dawson Richardson Publications, n.d.).
10. J.C. Everitt, "The Borderlands and the Early Canadian Grain Trade," in *The Borderlands Anthology,* ed. R. Lecker (Montreal: ECW Press, 1991), 149.
11. Dickinson, *Prairie Wheat,* 16; A.H.R. Buller, *Essays on Wheat* (New York: Macmillan, 1919), 216.
12. Morton, *Manitoba,* 82.
13. R.T. Naylor, *The Banks and Finance Capital, Volume 1 of The History of Canadian Business: 1867–1914* (Toronto: J. Lorimer, 1976), 15.
14. Buller, *Essays,* 216.
15. C.M. Studness, "Economic Opportunity and the Westward Migration of Canadians During the Late Nineteenth Century," *Canadian Journal of Economics and Political Science* 30, 4(1964):584.
16. H.S. Patton, *Grain Growers' Cooperation in Western Canada* (Cambridge, MA: Harvard University Press, 1928), 5.
17. Ibid.
18. Buller, *Essays,* 32.
19. Hill's partners in this operation included George Stephen and Donald Smith; A. Martin, *James J. Hill and the Opening of the Northwest* (New York: Oxford University Press, 1976). Hill was later involved with Stephen and Smith in the beginnings of the CPR. Indeed, capital from this American venture enabled these partners to partly fund their involvement in the CPR.
20. Buller, *Essays,* 32; Patton, *Grain Growers',* 6.
21. Buller, *Essays,* 33.
22. Studness, "Economic Opportunity," 573.
23. "Canadian Industries: 1 — The Milling Industry," *Dominion Illustrated* 3, 53(6 July 1889):6.
24. P.F. Sharp, "The Northern Great Plains: A Study in Canadian-American Regionalism," *Mississippi Valley Historical Review* 39(1952):71.
25. Buller, *Essays,* 49.
26. L.H. Thomas, "A History of Agriculture on the Prairies to 1914," *Prairie Forum* 1(1976):31–45.
27. Fowke, *National Policy,* ch. 6; Morton, *Manitoba,* chs. 9 and 10.
28. In 1910 Eaton's "Standard" Grain Bags cost between $2.55 and $3.59 per dozen, or $20.25 and $28.75 per hundred, depending upon quality; *Canadian Farm,* 8 April 1910, 20.
29. J.C. Everitt and W. Gill, "The Changing Geography of the Terminal Elevator: A Preliminary Analysis" (Paper presented to the 17th annual meeting of the Prairie Division of the Canadian Association of Geographers, Wasagaming, Manitoba, September 1993).
30. Now called a "primary elevator," a country elevator has traditionally been "any elevator in the Western Division in which grain is stored or from which it is discharged before it has been inspected, and graded." The "'Western Division' means that portion of Canada lying west of the meridian passing through the eastern boundary of the City of Port Arthur," *List of Grain Elevators in the Western and Eastern Division* (Ottawa: King's Printer, 1941), 8–9.
31. Wilson, *Century of Canadian Grain,* 14.
32. P.J. Dondlinger, *The Book of Wheat: An Economic History and Practical Manual of the Wheat Industry* (New York: Orange Judd, 1912), 203.
33. American railway companies introduced standardization at about the same time; H.M. Larson, *The Wheat Market and the Farmer in Minnesota,* Studies in History, Economics and Public Law, Faculty of Science, Columbia University, No. 269 (New York: Columbia University Press, 1926), ch. 6.
34. Wilson, *Century of Canadian Grain,* 14.
35. Ibid. The St. Paul and Sioux City railroad had experimented unsuccessfully with owning its own elevators; K.D. Ruble, *The Peavey Story* (Minneapolis: The Peavey Company, 1963), 44–5. This failure was undoubtedly known to the CPR management and may have influenced their decision to keep out of the grain-storage business.
36. The incentives would have included a choice of elevator points and of sites at these points. These benefits were certainly accorded to the line elevator companies over the years. The incentives were not always made public, and secret agreements between elevator companies became a feature of the grain trade as well as a bone of contention between the grain traders and the farmers, who believed that such arrangements were to their detriment.
37. Fowke, *National Policy,* 107.
38. D. Holdsworth and J.C. Everitt, "Bank Branches and Elevators: Expressions of Big Corporations in

Small Prairie Towns," *Prairie Forum* 13, 2(Fall 1988):173–90.

39. Canadian in the context of this paper does not necessarily mean citizenship but rather origin — although the two were, of course, closely connected. Most of the elevator owners during this period appear to have originated from central and eastern Canada, with the majority coming from Ontario. Addresses of members of the Grain Exchange are the best early indication of national origin available, although the data are not entirely reliable. In 1889 none of the 100 members had non-Canadian addresses.
40. The three were the W.W. Ogilvie Milling Company, McBean Bros. from Montreal, and D.H. McMillan, who had come west at the time of the Riel Rebellion. Except where otherwise stated, data in the chapter refer to country elevators and exclude the large storage structures associated with flour mills; they also omit terminal elevators.
41. The CPR saw this as in its own interest, as it ensured the early construction of elevators and thus income for the railway company. There is evidence that Ogilvie Milling misused its position at an early time, but the CPR's need for this company's elevators caused its management to turn a blind eye to the abuses.
42. The CPR leased the M&NW in 1900. The latter had gained control of the Saskatchewan and Western (S&W) in 1880. Although the M&NW land grant was almost used up, Canadian Pacific apparently received at that time 98,880 acres (40,015 ha) that resulted from the construction of 15.5 miles (24.9 km) of rail from Minnedosa to Gautier using the S&W land grant. The S&W branch line from the M&NW at Minnedosa to Rapid City, built in 1886, was apparently the first constructed to reduce the haul for farmers living between main railway lines (J.H. Warkentin, "Western Canada in 1886," *Transactions of the Historical and Scientific Society of Manitoba,* Series III, 20(1963–64):93). See J.A. Eagle, *The Canadian Pacific Railway and the Development of Western Canada, 1896–1914* (Kingston: McGill-Queen's University Press, 1989), 180.
43. This American-financed railroad had been chartered by the province in 1888 to break the monopoly of the CPR (Morton, *Manitoba,* ch. 10) by building and developing branch lines in the province.
44. Provincial status for Alberta and Saskatchewan was not gained until 1905.
45. J.C. Everitt, "Early Development of the Flour Milling Industry on the Prairies," *The Journal of Historical Geography* 19, 2(1993):101–21.
46. The Portage, Westbourne, and North Western Railway (later Manitoba and Northwestern), begun in 1880, acted as a feeder for the CPR, which took it over in 1894. The Manitoba and South Western was begun in 1881 and taken over by the CPR in 1882. The CPR built its own line to Souris in 1886. The Great North West Central, which dates back to 1880, was leased in perpetuity by the CPR in 1900.
47. In 1890 Lake of the Woods owned five country elevators. Nicholas Bawlf had seven flat warehouses, but these had only about one-third the capacity of the milling company's elevators.
48. "Canada as a Producer and Exporter of Wheat," *Wheat Studies of the Food Research Institute* (Palo Alto, CA: Stanford University) 1, 8(July 1925):235.
49. Martin, Mitchell and Company owned 13 structures in 1890, all along NP&M lines. It was a partnership, however, not an amalgamation of smaller units. It became part of the Northern Elevator Company in 1893.
50. A. Levine, "The Bawlf Family: A Vanished Legend in the Winnipeg Grain Trade," *Manitoba Business* 6, 7(November 1984):33–8.
51. The Northern Elevator Company included elevators from Bawlf, Campbell and Green, H. Crowe, Atkinson and Co., Roblin and Armitage, as well as Martin and Mitchell and others. Martin and Mitchell had dominated, and had been at least partly financed by the NP&M railway.
52. This company was Parrish and Lindsay. It was formed in 1886 and continued operating until 1907. These two businessmen were also investors in the Manitoba Grain Company, a short-lived syndicate formed in 1897. After two years with Western Canada Flour Mills (1907–9), W.L. Parrish joined N.G. Heimbecker to form the family company (Parrish and Heimbecker Ltd.) that still operates today as the eighth-largest elevator-owning company on the Prairies.
53. The Dominion Elevator Company was made up of elevators owned by R.P. Roblin (previously with the Northern Elevator Company) and by MacMillan Bros.
54. As late as 1902 only four or five members of the Grain Exchange gave addresses in the United States.
55. J.C. Everitt, "A 'Tragic Muddle' and a 'Cooperative Success': An Account of Two Elevator Experiments in Manitoba, 1906–1928," *Manitoba History* 18(Autumn 1989):12–24.
56. H.M. Larson, *The Wheat Market and the Farmer in Minnesota,* Studies in History, Economics and Public Law, Faculty of Science, Columbia University, No. 269 (New York: Columbia University Press, 1926), 235.
57. W.C. Clark, *The Country Elevator in the Canadian West,* Bulletin No. 20 of the Departments of History and Political and Economic Science in Queen's University (Kingston, ON: Queen's University, 1916), 9.
58. B.F. Goldstein, *Marketing: A Farmer's Problem* (New York: Macmillan, 1928).
59. H. Boyd, *New Breaking: An Outline of Co-operation Among the Western Farmers of Canada* (Toronto: Dent, 1938), 24.
60. L.A. Wood, *A History of Farmers' Movements in Canada* (Toronto: The Ryerson Press, 1924), 161.
61. A. Levine, *The Exchange: 100 Years of Trading Grain in Winnipeg* (Winnipeg: Peguis, 1987).
62. "Provincial Ownership and Operation of a System of Line Elevators" known as "The Partridge Plan," Appendix to *Manitoba Grain Growers' Association Annual Report and Proceedings* (Winnipeg: MGGA, printed by De Montfort Press, 1908).
63. W.T. Easterbrook and H.G.J. Aitken, *Canadian Economic History* (Toronto: Macmillan, 1956), 499.
64. Everitt, "A Tragic Muddle"; D.A. MacGibbon, *The Canadian Grain Trade 1931–1951* (Toronto: University of Toronto Press, 1952), ch. 11. It also led to the significant use of "loading platforms" in order to avoid the elevator companies.
65. R.D. Colquette, *The First Fifty Years: A History of United Grain Growers Limited* (Winnipeg: Public Press, 1957), 20.
66. *The Grain Growers Record 1906 to 1943* (Winnipeg: United Grain Growers, 1944), 7.
67. Elevators burned or were dismantled or sold, meaning that the total number owned by the MEC changed constantly.
68. The Saskatchewan government deliberately avoided the option of government ownership, deciding instead to encourage the establishment of the Saskatchewan Co-operative Elevator Company.
69. The UGG owned its greatest number of elevators in the early 1970s.
70. J.C. Everitt, R. Kempthorne, and C. Schafer, "Controlled Aggression: James J. Hill and The Brandon, Saskatchewan and Hudson's Bay Railway," *North Dakota History* 56, 2(Spring 1989):3–19; J.C. Everitt and A. Williams, "An Analysis of Settlement Development in Southwest Manitoba: The Lenore Extension 1902–1982," in *Prairie and Northern Perspectives: Geographical Essays,* ed. J.H. Selwood and J.C. Lehr (Winnipeg: Department of Geography, University of Winnipeg, 1989), 87–105.
71. T.D. Regehr, *The Canadian Northern Railway* (Toronto: Macmillan, 1976);

R.S. Kirby, "Nineteenth-Century Patterns of Railroad Development on the Great Plains," *Great Plains Quarterly* 3, 3(Summer 1983):157–70; Everitt et al., "Controlled Aggression."

72. Although the peak mileage in the Manitoba rail system was not reached until the late 1950s, 89 percent of this total was in place by 1915.
73. J.C. Everitt and D.S. Everitt, "American Influences in the Canadian Grain Trade: An Overview," *Bulletin of the Association of North Dakota Geographers* 34(1984):1–9; J.C. Everitt, "Borderlands," 146–72.
74. Total membership numbers also increased, however. In 1900 there were 115 members, whereas by 1903 there were 232.
75. *The Grain Growers Record,* 1944, 7. The validity of this statement is open to some doubt, as Bawlf, MacMillan, and others were still important players in the grain trade. Certainly, however, the balance had swung towards people with American experience and capital.
76. R.E. Smith, *Wheat Fields and Markets of the World* (St. Louis: The Modern Miller Company Publishers, 1908), 350. This process was not peculiar to the grain trade. As early as 1909 Winnipeg had a hundred branches of American firms; R. Bellan, *Winnipeg First Century: An Economic History* (Winnipeg: Queenston Publishing, 1978), 95.
77. M.L. Hansen, *The Mingling of the Canadian and American Peoples* (New Haven: Yale University Press, 1940), 235.
78. Bettingen had operated a line of grain and lumberyards in the United States before selling out in 1903 and coming to Canada to organize, along with his brother-in-law, William Leistikow, the Imperial Elevator and Lumber Company. In 1906 he was vice president of both the Winnipeg Grain and Produce Exchange and the Retail Lumber Dealers Association; *Winnipeg Free Press,* 13 June 1906.
79. This appears to have been particularly the case for the Canadian Northern Railway and later the Grand Trunk Pacific, as the CPR had attracted much of the available Canadian capital to their lines by the turn of the century.
80. *Winnipeg Free Press,* 13 June 1906.
81. Much of this discussion is based upon letters and other data taken from the CN Archives, which are stored at the Public Archives of Canada: Call Nos. RC30, Vol. 9465, Files 1054-3, 1054-5, and 1054-6; and Vol. 8651, File 19-24-1. See also Ruble, *Peavey Story.*
82. By 1895 the F.H. Peavey and Co. system had become the largest line elevator company in the United States. It was headquartered in Minneapolis and had offices at Duluth, Chicago, Kansas City, and Omaha; Larson, *Wheat Market,* 229. Piper and Co. were grain merchants with offices in Minneapolis, Duluth, and Chicago, and the Douglas Brothers Company operated out of Cedar Rapids, Iowa. Robert Stuart was with the American Cereal Company. It is unclear whether E.C. Warner was involved with the elevator syndicate at this stage.
83. F.B. Wells (Peavey and Co.) to Z.A. Lash (Canadian Northern Chief Solicitor), 20 May 1902, CN Archives. Augustus L. Searle, then a Peavey employee, was part of this party.
84. Ruble, *Peavey Story,* 61.
85. Letter from D.B. Hanna, General Superintendent of Canadian Northern, to Z.A. Lash, Chief Company Solicitor, 6 June 1902. CN Archives.
86. D.B. Hanna to Z.A. Lash, 6 June 1902; Z.A. Lash to D.B. Hanna, 10 June 1902, CN Archives. Lash later told another American firm that the "policy of the Company is to treat all elevators alike, and give no rights to one which are not given to others," but clearly, in the final analysis, some prospective clients were more equal than others; Z.A. Lash to G.H. Meldrum, 25 September 1902, CN Archives.
87. W.H. McWilliams to Z.A. Lash, 11 August 1902, CN Archives.
88. Twenty lumber yards costing $3,000 each were projected; W.D. Douglas to Z.A. Lash, 7 February 1903, CN Archives.
89. From 1901 to 1911 Manitoba's population grew by some 81 percent, that of Saskatchewan by 440 percent, and that of Alberta by 413 percent. See W.P. Ward, "Population Growth in Western Canada, 1901–71," in *The Developing West,* ed. J.E. Foster (Edmonton: University of Alberta Press, 1982), 159.
90. W.J. Wilgus, *The Railway Interrelations of the United States and Canada* (New Haven: Yale University Press, 1937), 214.
91. Fifty-four percent of these were Atlas or Security-owned structures.
92. Ruble, *Peavey Story,* 62.
93. Mackenzie and Mann, the organizers of the Canadian Northern, had stock in the British America Company; Ruble, *Peavey Story,* 63.
94. Wilson, *Century of Canadian Grain,* 15–6. The eight companies were the British American (CN); the National (CN and CP); the Northern Elevator Company (CN and CP); Atlas Elevator Company (GTP); the Security Elevator Company (GTP); and the Monarch Elevator, Globe Elevator, and Grand Trunk Pacific Elevator companies, which operated terminal elevators on Lake Superior.
95. The W.W. Ogilvie Milling Company was purchased along with A.W. Ogilvie and Co. in 1902 by a Montreal syndicate, and renamed the Ogilvie Flour Mills Ltd.
96. These included the Port Arthur Elevator Company, the Security Elevator Company, the Saskatchewan Elevator Company, the Liberty Grain Company, Northland Terminals, the Globe Elevator Company, Searle Terminal, and the National Elevator Company.
97. Bellan, *Winnipeg First Century,* 5.
98. Everitt, "Borderlands," 1991; *Pooling Alberta's Wheat* (Calgary: Alberta Co-operative Wheat Producers, 1928), 5.
99. J.C. Everitt, "The Line Elevator in Saskatchewan," *Saskatchewan History* 44, 2(Spring 1992):41–58; J.C. Everitt, "The Line Elevator in Alberta: Part One," *Alberta History* 40, 4(Autumn 1992):16–22; J.C. Everitt, "The Line Elevator in Alberta: Part Two" *Alberta History* 41, 1(Winter 1993):20–6.
100. Today the Saskatchewan Wheat Pool owns one-third of the Prairie elevators.
101. H.R. Grant, "Captive Corporation: The Farmers' Grain and Shipping Company, 1896–1945," *North Dakota History* 49, 1(1982):4–10.
102. Easterbrook and Aitken, *Canadian Economic History,* 500.
103. Fowke, *National Policy,* 149. The succeeding discussion is largely based upon Wilson, *Century of Canadian Grain,* and Friesen, *Canadian Prairies.*
104. J. Blanchard, *A History of the Canadian Grain Commission* (Ottawa: Minister of Supply and Services, 1987), 28.
105. Easterbrook and Aitken, *Canadian Economic History,* 502.
106. *Grain and Rail in Western Canada,* the Hall Commission Report, Vol. 1 (Ottawa: Minister of Supply and Services, 1977), 48.
107. MacGibbon, *Canadian Grain Trade,* 340.
108. The Saskatchewan Co-operative Elevator Company owned 451 country elevators plus two terminals at Port Arthur, had a lease on a CNR terminal at Fort William, and had a transfer elevator at Buffalo, New York.
109. *The Canadian Wheat Pool Year Book, 1925* (Winnipeg: Canadian Co-operative Wheat Producers, 1925), 42–3.
110. Cargill has been in Canada since 1930, but has had an extensive line of elevators only since 1974.
111. L.H. Thomas, "A History of Agriculture on the Prairies to 1914," *Prairie Forum* 1(1976):44.
112. T. Veeman and M. Veeman, *The Future of Canadian Grain: Canada's Prospects for Grains, Oilseeds and Related Industries* (Toronto: Lorimer, 1984), 5.

Case Study 14.1
N.M. Paterson and Sons Ltd.: A Home-Grown Success Story

John Everitt

The N.M. Paterson and Sons Ltd. grain company was founded by Norman M. Paterson, later Senator Paterson, who was born in Portage la Prairie in 1883. He was one of very few elevator company owners who was truly a product of the Prairies. Although employed by railway companies from the age of 15, Paterson decided that his future lay in the grain trade and started working in the Winnipeg Grain and Produce Exchange when he was 20 years old. Five years later, he moved to Fort William, where, after buying and selling bulk "screenings," he managed by 1912 to gather enough financing to build a small terminal elevator, Elevator K.[1] This was followed by the construction of Elevator O in 1915. Terminals, including "hospital elevators,"[2] as well as lake freighting, remained an important part of the Paterson grain trade empire for many years.

Like many of his grain trade contemporaries, Paterson also decided that true success in the grain trade could be guaranteed only by vertical integration of grain-handling operations, including country elevators. His first venture into the line elevator business came in May 1914, when he purchased the Royal Elevator Company, a line of 12 elevators in south-central Saskatchewan, which he renamed the Interior Elevator Company.

In 1916 Paterson added the 12 elevators owned by McLaughlin and Ellis to his company. These were again mostly located in Saskatchewan, mainly in the area along the CPR main line east of Regina, but one of them, in Alexander, was the first Paterson-owned elevator in Manitoba. In 1917 he purchased 11 "houses"[3] from the Saskatchewan and Western Elevator Company, mostly in the area around Assiniboia, southwest of Regina. He purchased 23 more from the Northern Elevator Company in 1918, as this company reorganized its holdings as a result of its own policy of territorial expansion. Fifteen of these houses were in Manitoba and the rest in southern Saskatchewan. During these years Paterson also bought other elevators (such as those at Treherne, Ridgeville, and Crystal City, purchased from the Manitoba Elevator Commission) and built others (such as those at Dacotah and Grandview). By 1920 the "line" included 76 structures.

In 1920 the assets of the Interior Elevator Company were absorbed into N.M. Paterson and Company Ltd. (the terminal operation), in one of the early elevator company consolidations of the decade. By the mid-1920s, 30 additional country elevators had been added by purchase and construction; the most important single purchase was that of 9 houses from the Young Grain Company in southwestern Manitoba. By 1925 the Paterson company owned 97 elevators, mostly in southern Manitoba and Saskatchewan — a regional distribution that persisted into the 1960s (Figure 14.1.1) and, despite major industry changes, to the present. By the mid-1920s it had a permanent office in Winnipeg and one at Fort William. The only elevator it has ever owned in Alberta is at Hilda, just a few kilometres west of the Saskatchewan boundary.

The number of houses owned soon rose to over 100, peaking in the mid-1940s (Table 14.1.1), as Paterson built new structures and bought a few others to make a more complete and cohesive line, but one still within the company's traditional sphere of influence. As with other companies, elevator sales and closings, along with events such as fires, also affected the overall distribution and number of elevators owned. One of the Royal elevators was sold as early as 1917. By the mid-1940s the Paterson company had at some time owned over 140 elevators before ending up with its line of 108.[4]

Minor fluctuations in elevator numbers continued to occur between the mid-1940s and the early 1970s, reflecting the continually changing nature of the trade. Because of a

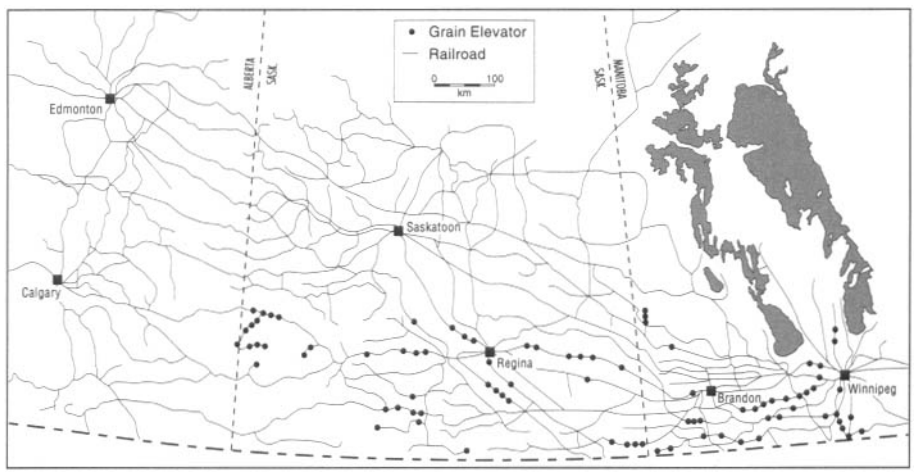

Figure 14.1.1 Distribution of N.M. Paterson and Sons Ltd. Grain Elevators in the 1960s (Source: Government of Canada data)

Table 14.1.1 Number of N.M. Paterson and Sons Elevators, 1914–92

Year	Number	Date	Number
1914	12	1952–53	104
1920–21	76	1960–61	105
1924–25	97	1970–71	98
1928–29	101	1980–81	85
1932–33	103	1983–84	77
1943–44	108	1989–90	52

Source: *Grain Elevators in Canada* (Ottawa: Ministry of Supply and Services, various years).

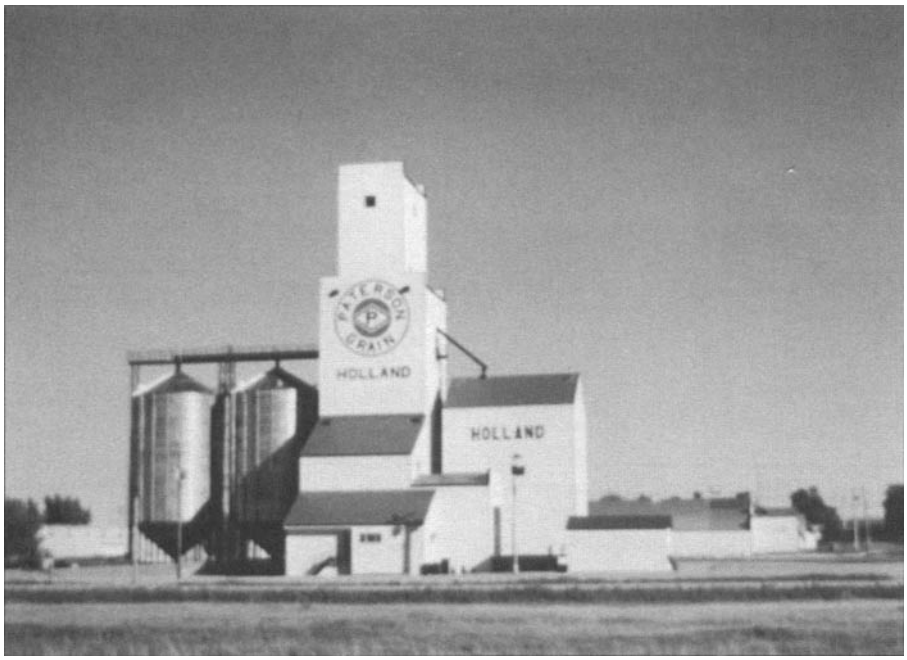

Figure 14.1.2 The N.M. Paterson and Sons Ltd. Elevator at Holland (Photograph: J. Everitt)

rationalization of the grain trade and the abandonment of rail lines, the company has adjusted its holdings dramatically in the last 20 years, as have the other major elevator-owning companies. Currently only about 50 elevators remain in the Paterson line, although this still represents the seventh-largest number of elevators owned by any company. Many of these are new high-throughput or greatly rebuilt structures that have much more capacity and are much more efficient than the original elevators (Figure 14.1.2).

Several of these changes have involved "saw-offs" with other companies, so that each company can be dominant (or monopolistic) at one location. As a result of saw-off with Manitoba Pool Elevators, Paterson now owns both elevators at Minto, where the company first entered the market through its purchase of Young Grain Company, while the Pool owns all the capacity at Alexander, where Paterson first gained entry into the Manitoba country elevator system!

N.M. Paterson and Sons Ltd. no longer owns a terminal elevator, having demolished its outdated and poorly located Thunder Bay structure in 1978. It now ships its grain through other company terminals under a long-term marketing agreement.

Despite the changes that have continually occurred in the grain trade, the Paterson company has managed to survive and thrive. In 1921 a dozen companies owned more elevators than Paterson, but only two, the United Grain Growers and Pioneer Grain, still exist. One of many family companies in the 1920s, Paterson is one of only four today.[5] Its probability of survival is high, and it is likely that this locally grown organization will endure for the foreseeable future.

NOTES

1. The "short history" of the Paterson company states that Norman Paterson persuaded the Dominion Bank (still the company's bankers) and one of the lumber companies in Fort William to finance him (offprint, n.d.).
2. The term "hospital elevator" included every elevator or warehouse used for cleaning or other special treatment of rejected or damaged grain, and that was equipped with special machinery for that purpose.
3. An industry colloquialism for elevators.
4. For instance, the Royal elevators at Richardson and Roche Percee were sold to Saskatchewan Pool Elevators in 1927 and 1928; the Dumas elevator built in 1914 was dismantled in 1938 and the material was used to build one at La Salle; elevators at Rowatt (1923), Herbert (1916), and Parkbeg (1916) burned but were rebuilt.
5. Pioneer Grain (the Richardsons), Parrish and Heimbecker, and Cargill would still qualify in this category.

Case Study 14.2
The End of the Line: The Life and Death of the Lenore Extension

Allison Williams and John Everitt

The settlement framework of the Prairies was determined by the skeleton of railroad tracks laid down in the late 19th century and the first decade of the 20th century. In particular, this included the lines of the Canadian Pacific (CP), the Canadian Northern (CNor), and the Grand Trunk Pacific (GTP) railways. But much of the present-day character of the railway system came only after a network of branch lines was developed to create traffic for the main lines. These branch lines were built either directly by the major railroad companies or by independent operations such as the Manitoba and North Western (M&NW) Railway and the Great North West Central (GNWC) Railway, and then leased or sold to one of the transcontinental companies. One such line was the Lenore Extension to the GNWC, which traversed Daly Rural Municipality (RM) and parts of Elton and Woodworth

RMs (Figure 14.2.1).

By the late 19th century there were several branch lines north of Brandon, but between the GNWC main line and the CP main line, there was a stretch of countryside 15–30 miles (24–48 km) from north to south and 45 miles (72 km) from east to west that was not crossed by a railway line. For the local farmers who were still using horse-drawn wagons, this was a significant problem. Pressure for a line through this unserviced area dated back to at least 1889 but grew stronger over the next decade, eventually gaining the support of the provincial government in 1900. The government exerted pressure on the CPR, which was seeking financial support for further branch line construction and which had leased the GNWC in perpetuity in 1900. The construction of a branch line west from Forrest was agreed upon. Track laying began in 1902, and the Lenore Extension opened in 1903.

The line ran for nearly 42 miles (67.6 km) from Forrest to Lenore but crossed stretches of difficult country, requiring the building of numerous bridges and trestles and the filling of gullies and ravines. In particular the valleys of the Little Saskatchewan River and the Oak River led to a more circuitous and expensive route than was desirable, and the presence of the Assiniboine Valley just west of Lenore enforced the termination of the line at this point, despite the hopes of some locals that the line would cross this glacial spillway and become a through line to the West.

Initially poor service was a source of concern as trains ran on the branch line only twice a week, but complaints from local politicians resulted in daily service. By the 1920s, however, frequency had once again been reduced, probably reflecting the coming of the automobile as well as the building around 1910 of the main line of the GTP (now the Canadian National mainline), which traversed much of the same territory. In the 1930s, reflecting the more difficult economic times, service was further cut back, to its original twice-a-week schedule. This pattern continued until 1962, when passenger service ceased. Eventually trains were sent down the track only when

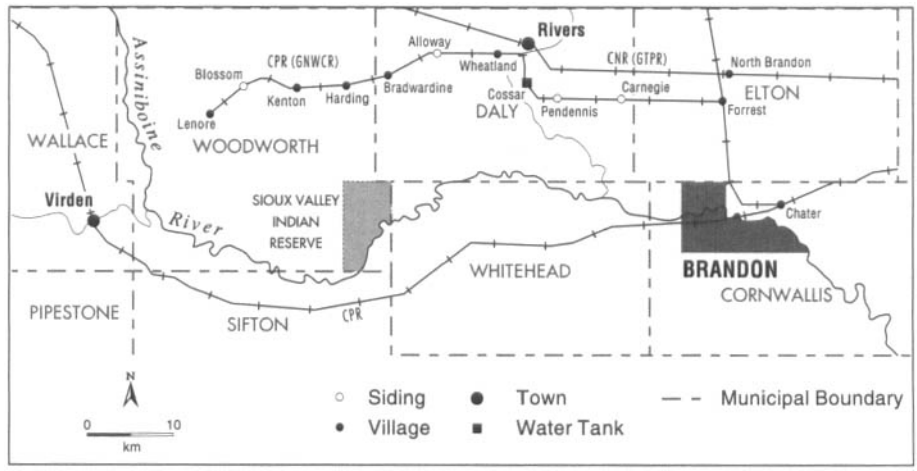

Figure 14.2.1 Great North West Central Line

requested for grain pick-up.

Over the years the condition of the line deteriorated and the CPR failed to maintain it. Combined with the circuitous route, this meant that only a limited selection of equipment could operate on the line. By the late 1970s, the CPR was attempting to have the line scheduled for abandonment, pending the results of the Hall Commission inquiry. Although the commission recommended that some of the line be retained in order to maintain service to some otherwise isolated areas, the bulk of the line was eventually closed. The last train to service the Lenore Extension ran on 7 August 1980.

The effects of rail line abandonment upon the service structure of the branch line settlements has always been a bone of contention, largely because it is difficult to separate these effects from other factors, such as road transportation improvements and changes in farming practices, that have been correlated with rural decline in the past 40 years. In the case of the Lenore Extension settlements, however, the effects seem clearer. The demise of the rail line was followed by the loss of many services, particularly elevators but also banks, post offices, and others. Although the closure of the Lenore Extension did not cause rural decline in this region, it certainly accelerated it, and most of the Lenore line settlements are now little more than neighbourhood gathering places.

The history of the Lenore Extension shows that the fine-tuning of regional settlement must be looked at in addition to broad developments in order to fully understand the social and economic ramifications of change on the Prairies. The Lenore Extension was probably doomed from the start because of its problematic route, and its fate was certainly sealed by subsequent events.

Thus the abandonment of this branch line can be viewed as the inevitable result of a series of events that began not recently but 80 years earlier, when the route was first decided. What we see now is just the end of one more phase in the evolving landscape of Manitoba, although for the Lenore Extension it marks the end of the line.

AGRICULTURE IN MANITOBA

15

William J. Carlyle

The main crops grown and principal types of livestock raised commercially on Manitoba farms originated in the Old World. Wheat, barley, oats, and rye, the most important grain crops; flaxseed, a main oilseed; and cattle, pigs, and sheep, the predominant types of livestock, were all domesticated in Asia Minor and the eastern Mediterranean 7,000–10,000 years ago. In the ensuing millennia, these crops and livestock, together with poultry, were introduced to or domesticated locally from wild variants in Europe north of the Alps. Various grasses, clovers, root crops, and garden vegetables were added to European agriculture in more recent times.[1]

Most of these crops and livestock, plus some Native Indian elements such as corn (maize), were introduced to what is now Manitoba during the fur trade era, notably to the semicommercial river-lot farms of the Red River Settlement between 1812 and 1870 (Chapter 6).[2] Although full integration of crops and livestock into a European type of mixed-farming system did not take place, both crops and livestock were raised on most farms.

After the Dominion of Canada purchased Rupert's Land from the Hudson's Bay Company and made part of it into the province of Manitoba in 1870, commercial farmers spread through southern Manitoba, prompted by the Homestead Act's policy of virtually free land and the development of a transcontinental railway system. The settlers were of diverse ethnic and religious backgrounds, but almost all were of European heritage or origin. They were generally familiar with, and added to, the crops and livestock that had been introduced to Manitoba before 1870. The task of these settlers, those who followed them, and their descendants has been to select, adapt, and modify these agricultural ingredients to suit the physical geography of Manitoba and both local and distant markets.

THE SITUATION IN 1941

The year 1941 can be viewed as peak of traditional diversified farming in Manitoba, as developed by the early settlers of European backgrounds within the framework of the Dominion Lands Survey and settlement system. Most farms comprised one to two quarter sections (160–320 acres, or 65–130 ha), in accordance with the original homestead allocation of one quarter section and the opportunity to acquire an additional quarter by preemption or purchase (Figure 15.1c). Besides cash crops, farm families generally raised pigs, chickens, and dairy and beef cattle for home use and frequently also for market, and most had a vegetable garden (Figure 15.1e).

Mechanization of farm work had been under way for decades, but by 1941 there were still on average six horses per farm compared with one tractor for every three farms (Figure 15.1d). The farm population was at or near its all-time peak, and the some 250,000 people living on 58,000 farms comprised one-third of the total population of Manitoba (Figures 15.1a and 15.1b).

Crops were predominantly grains, principally wheat, barley, oats, and rye in this order. About one year in every two or three, the cropland was summer-fallowed to conserve moisture, allow tillage of weeds, and interrupt cycles of plant diseases.

Some crop rotations included nitrogen-fixing crops such as alfalfa or clover, but in general the grain-fallow system predominated and the natural fertility of the prairie soil, with the addition of some livestock manure, was relied upon to maintain yields. Unimproved land accounted for about 40 percent of total farmland, and most of it was used as rough pasture for cattle (Figure 15.1f).

The concept of *livestock units* is useful for reducing livestock as diverse as chickens and cattle to some sort of equivalence.[3] Of the some 1.1 million livestock units on Manitoba farms in 1941, more than 80 percent were accounted for by dairy cattle, other cattle, and horses in roughly equal proportions (Figure 15.2f). Pigs, poultry (mostly chickens), and sheep formed the remainder.

TRENDS SINCE 1941

Since 1941 fundamental changes have taken place in the structure of Manitoba agriculture and in the relative importance, although not the main types, of crops and livestock. The farm population and number of farms have decreased progressively, so that by 1986 only approximately 87,000 people lived on 27,000 farms (Figures 15.1a and 15.1b). However, the amount of farmland, especially improved land, has increased substantially (Figures 15.1f and 15.3). These two trends — fewer farms and more farmland — have combined to produce an increase of 2.5 times in the average area of a Manitoba farm (Figure 15.1c). A dramatic increase in mechanization has contributed to this rapid growth in farm size (Figure 15.1d).

With a few exceptions, the area, yield, and production of all the main crop categories — grains, oilseeds, and tame hay and fodder — have increased since 1941 (Figure 15.4). Increases in area are mainly the result of improving or bringing under cultivation land that was unimproved farmland or not part of farms at all in 1941. A considerable reduction in summer fallow since the 1970s is another contributing factor (Figure 15.3).

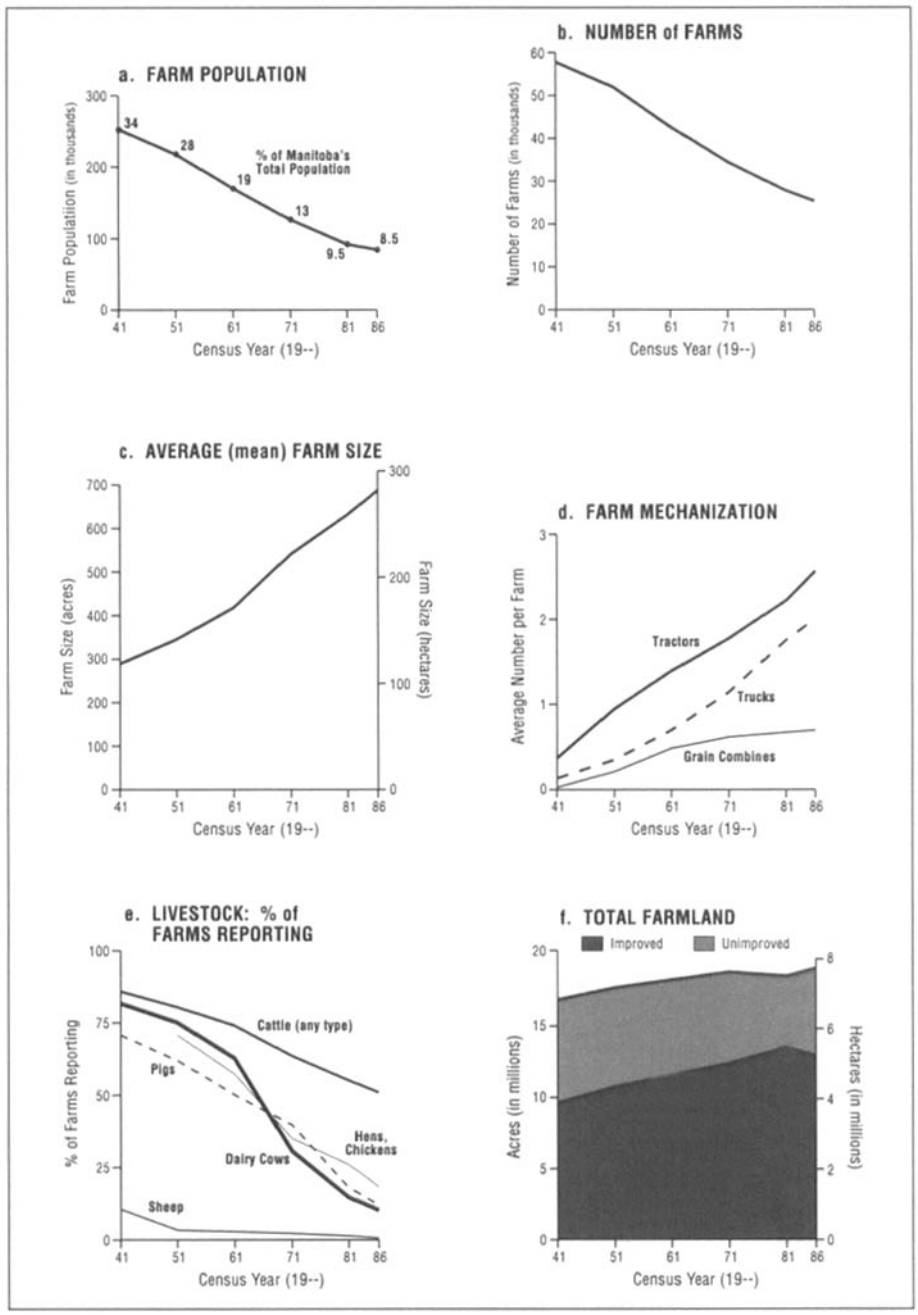

Figure 15.1 Trends in Manitoba Agriculture, 1941–86 (Source: Statistics Canada)

Increases in yield can be ascribed largely to the use of artificial fertilizers, as well as better weed control — partly through the use of pesticides and herbicides — better tillage practices, and, for some crops, the development of higher-yielding varieties.[4] Wheat, flaxseed, and canola experienced the most dramatic increases in both area and yield, and hence also in production (Figure 15.4).

The total number of livestock units on Manitoba farms has changed little since 1941, but there have been significant changes in emphasis on the types of livestock raised. The number of horses declined from some 300,000 in 1941 to 40,000 in 1986 (Figure 15.2d). The relatively few remaining horses are kept mainly for pleasure riding and the production of estrogen, which is extracted from the urine of pregnant mares, rather than for farm work. Increased milk production per cow and declining per capita consumption of some dairy products because of concerns about cholesterol levels are the main reasons for the dra-

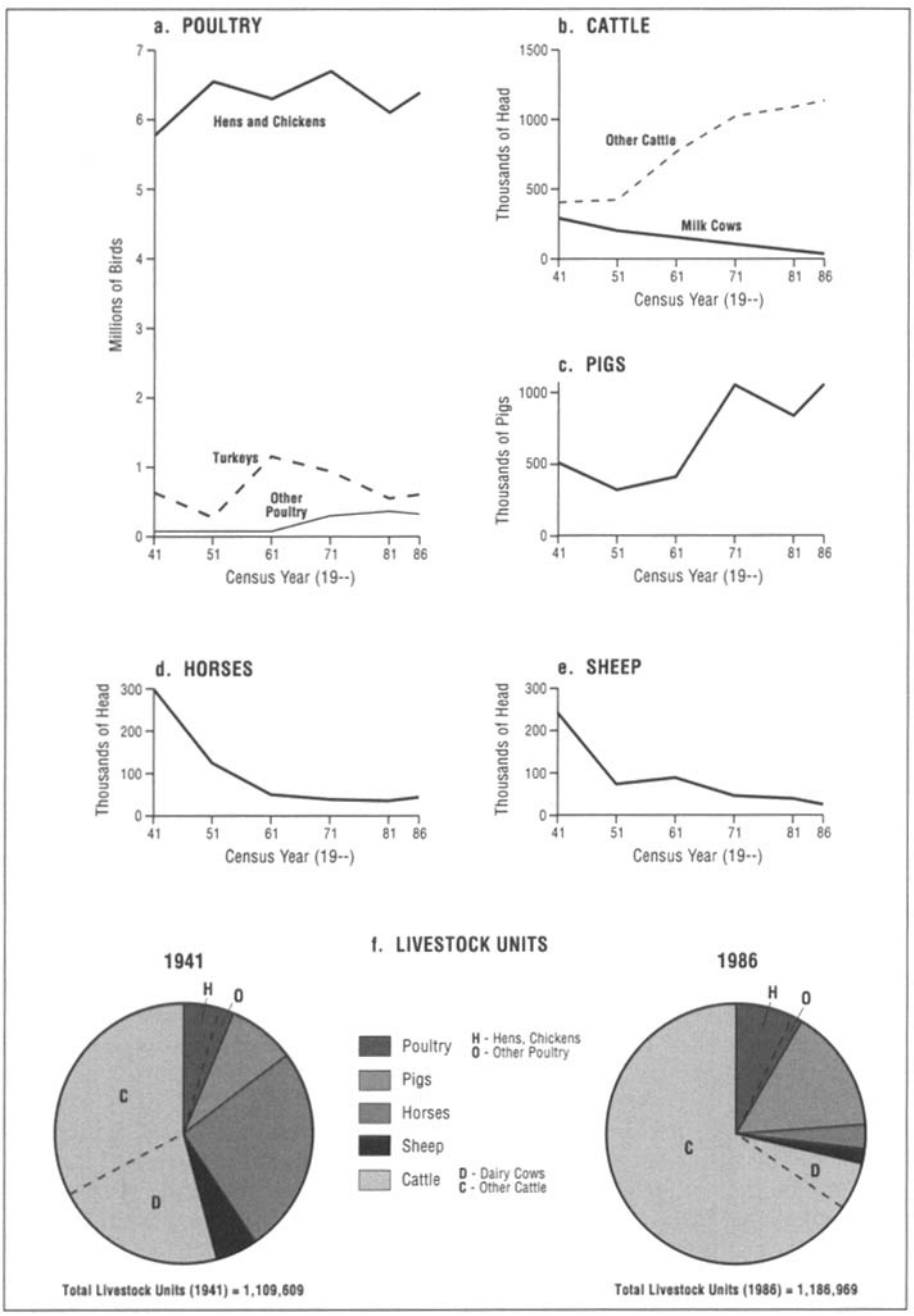

Figure 15.2 Trends in Livestock in Manitoba, 1941–86 (Source: Statistics Canada)

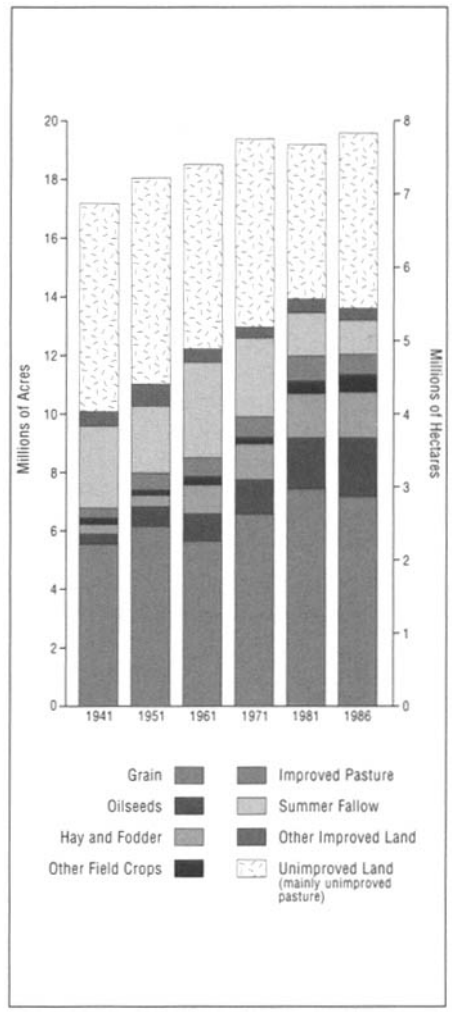

Figure 15.3 Trends in Land Use on Manitoba Farms, 1941–86 (Source: Statistics Canada)

matic decline in the number of milk cows (Figure 15.2b).

In contrast, the number of pigs and especially beef cattle has increased considerably to supply expanding domestic and foreign markets (Figures 15.2b and 15.2c). The number and main types of poultry have changed little since 1941, but production of poultry meat and eggs has increased substantially with the adoption of modern "factory" farming methods (Figure 15.2a).[5] Sheep have become even less significant than in 1941 (Figures 15.1e, 15.2e, and 15.2f).

In general, except perhaps for beef cattle, livestock enterprises have become increasingly specialized over the past 50–60 years. Whereas in 1941 the great majority of Manitoba farms had some dairy cows, chickens, or pigs, now these types of livestock are found on only 11, 19, and 13 percent of farms, respectively (Figure 15.1e). Even among such farms, a small number of farms is responsible for the bulk of the production.

A diagram showing value of production suggests a mixed crop-and-livestock form of agriculture in Manitoba, but this is misleading (Figure 15.5). A large proportion of farms have few or no livestock or poultry, and some of the large livestock and poultry enterprises have little or no cropland. This specialization is a significant change from the more diversified mixed farming of the past.

LIVESTOCK AND POULTRY

Farms on which poultry or a particular type of livestock form the main source of income account for about 30 percent of all farms in Manitoba (Table 15.1).[6] Although physical, cultural, and economic factors affect the geographical patterns of each main type, the mix of factors and the patterns themselves differ considerably.

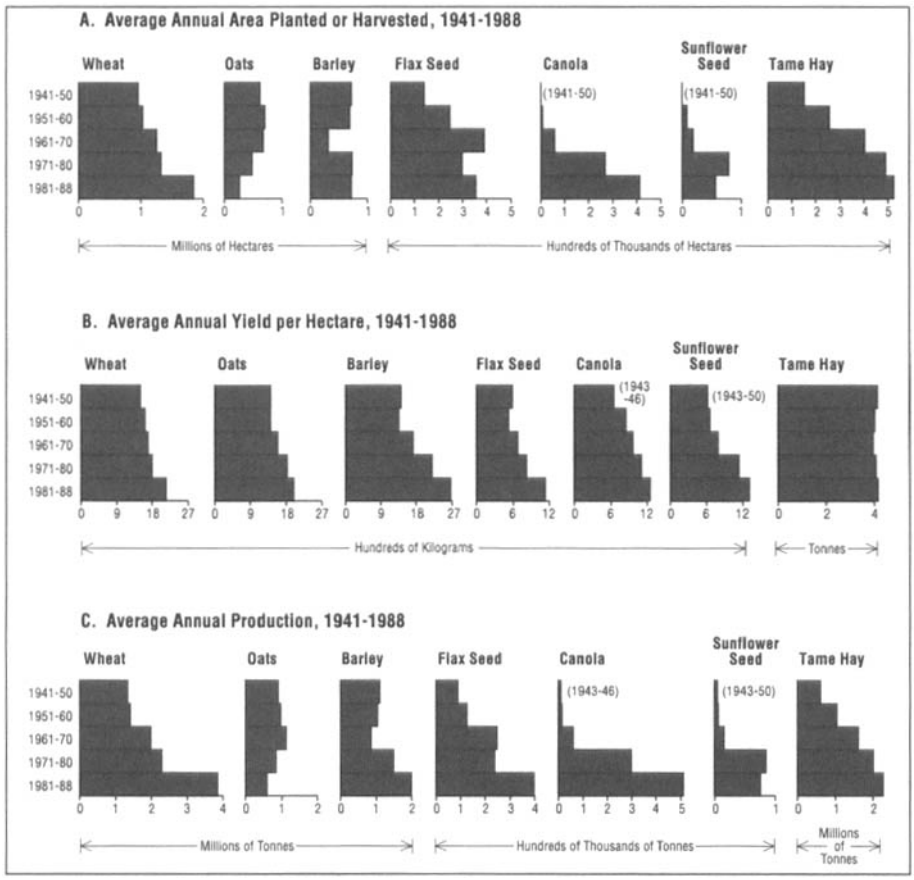

Figure 15.4 Trends in Area, Yield, and Production of Selected Crops in Manitoba, 1941–86 (Sources: Manitoba Agriculture, 100 Years of Agriculture in Manitoba *[Winnipeg: Manitoba Agriculture n.d.]; and Manitoba Agriculture,* Manitoba Agriculture Yearbook *[Winnipeg: Manitoba Agriculture, 1988])*

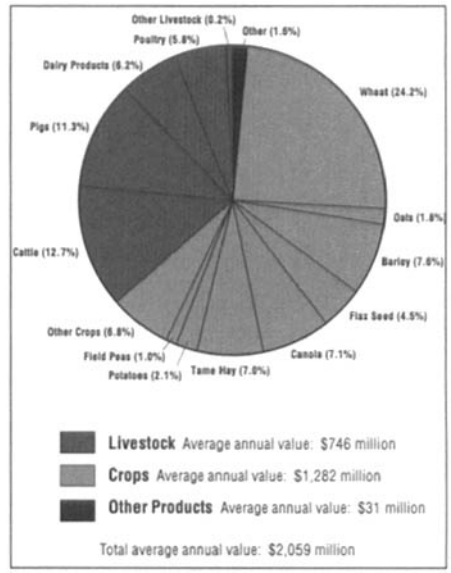

Figure 15.5 Average Annual Value of Agricultural Production in Manitoba, 1985–89 (Source: Manitoba Agriculture Yearbook *1985, 1986, 1987, 1988, and 1989)*

Beef Cattle

To analyse the geographical patterns of beef cattle farms, the proportion of beef cattle farms out of total farms in each of the 114 census subdivisions in the main agricultural zone of Manitoba was calculated.[7] The subdivisions were then ranked from highest to lowest according to this proportion and divided into five classes, with each class or quintile containing about 20 percent of the total number of subdivisions. The highest and second-highest quintiles were then mapped to show where beef cattle farms are of the greatest relative importance (Figure 15.6).

In general, beef cattle farms are concentrated in the poorest-quality farmland (Figure 15.7). A large proportion of the farmland, usually more than two-thirds, is unimproved pasture, and much of the improved land is sown to pasture and to tame hay and fodder crops for winter feed. Where tracts of such land are extensive, as in parts of the southeast and especially the western Interlake and Westlake regions, beef cattle farms are in the majority, and these districts can be considered beef cattle regions (Figure 15.6). In the other areas of concentration, such as adjacent to the Riding and Duck Mountains, in the Souris Basin, on parts of the Assiniboine Delta, and near The Pas (north of the mapped region), beef cattle farms are important but not predominant.

Most beef cattle farms are cow-calf operations, with the calves being born in the spring and marketed in the autumn at weights of 200–75 kg. The largest herds, numbering 100–300 cows — and in exceptional cases 600–1,200 — are maintained on large farms, more properly termed ranches. The larger ranches comprise 5,000–10,000 ha, most of which is Crown land on long-term lease from the provincial government, and the herds are still controlled and moved by cowboys on horseback. Some beef cattle farms only fatten calves and older cattle purchased from ranchers or farmers who breed or raise them. The most specialized of such farms are feedlots on which a thousand or more head of cattle are fattened annually on mainly purchased feeds.

A considerable, but not precisely known, number of beef cattle is kept throughout the agricultural zone of Manitoba on farms not classified as beef cattle farms.[8] On such farms the better land is typically sown to grain and oilseed crops, which are usually the main sources of income, and relatively small beef cattle herds are maintained to make productive use of patches of land unsuitable for cash crops and to diversify sources of income. On many farms, grain is used to fatten the cattle to slaughter weights.

The main farming district where beef cattle are noticeably scarce is the Red River Plain. This area is generally more suited to grain and other cash crops than to pasture or hay and fodder for beef cattle. Also, many farms lack sufficient supplies of fresh water for sizable herds.[9] Large numbers of beef cattle are confined mainly to a few intensive feedlots, the largest of which is the Red River feedlot near Sanford, which can feed 10,000 head a year.

Table 15.1 Types of Farms in Manitoba, 1986

Type of Farm	Number of Farms	% of Farms
Cattle (mainly beef)	4,682	18.5
Dairy	1,412	5.6
Pigs	1,111	4.4
Poultry	356	1.4
Total livestock and poultry	7,561	29.9
Wheat	6,272	24.8
Small grains (excluding wheat)	8,758	34.7
Field crops (other than small grains)	415	1.6
Total grain and field crops	15,445	61.1
Mixed	1,425	5.6
Other types	831	3.4
Total	25,262[1]	100.0

Note:
1. Only farms with sales of agricultural products of $2,500 or more in 1986 were classified, or 25,262 of the 27,336 census farms in total.

Source: Statistics Canada, *Census of Agriculture* (Ottawa: Statistics Canada, 1986).

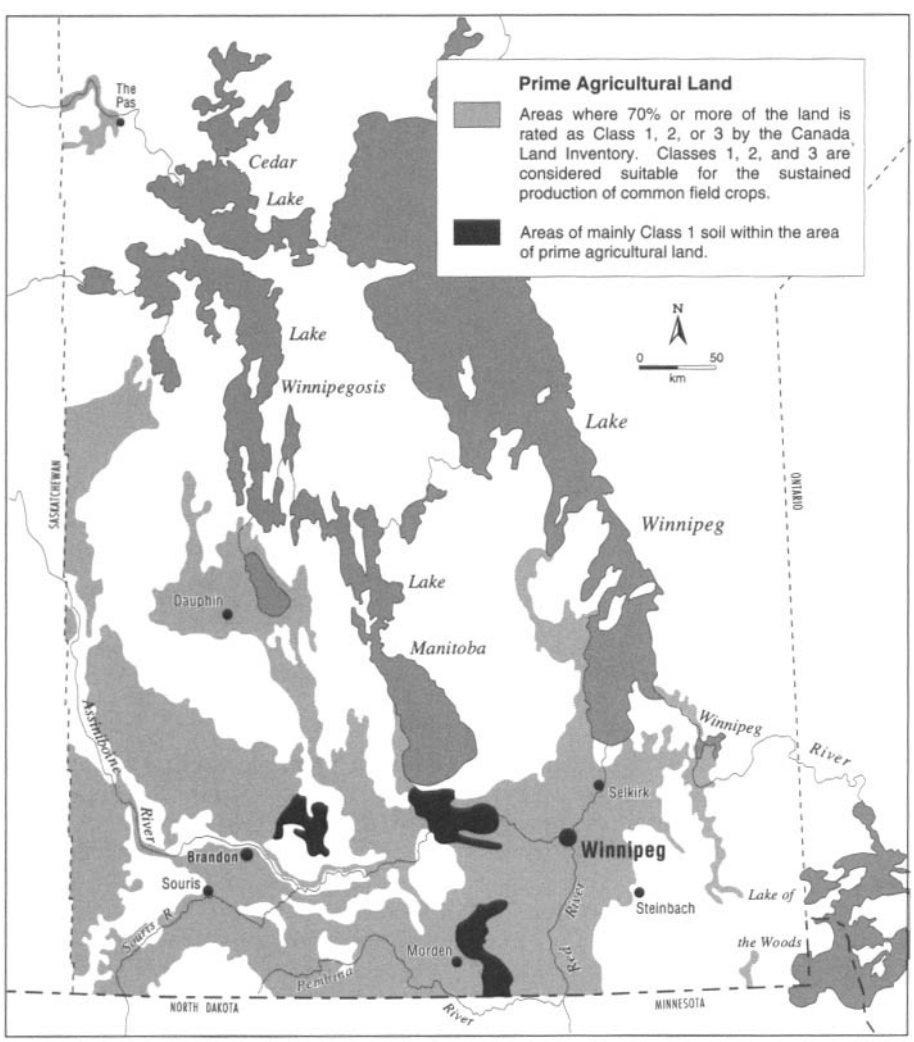

Figure 15.7 Prime Agricultural Land in Southern Manitoba (Source: Generalized from maps published by the Canada Land Inventory)

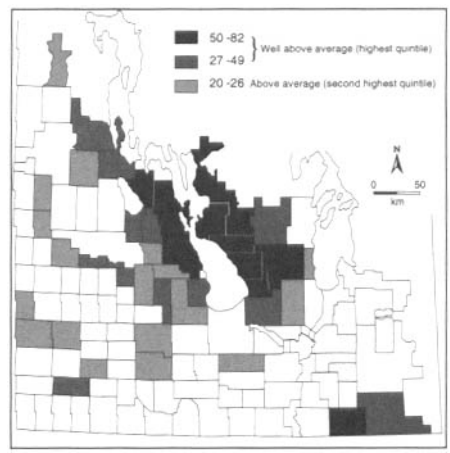

Figure 15.6 Beef Cattle Farms as a Percentage of all Farms by Census Subdivision. For explanation of numbers see text. (Source: Statistics Canada, unpublished data from the 1986 census)

Dairying

The number of dairy cows in Manitoba has declined considerably in recent years (Figure 15.2f). At the 1986 census, there were only 65,000 dairy cows in the province, and these were concentrated in one-ninth (3,000) of the total number of farms. Even with labour-saving devices such as milking machines, dairying still requires twice-daily milking throughout the year. Special skills and dedication to the well-being of the cow herd — through breeding programs, proper feeds and supplements, and clean and comfortable living conditions — are needed to obtain maximum yields. Capital investment is also high. These stringent requirements have made dairy farming a far more specialized form of agriculture than it was, to the point where the vast majority of farmers now purchase all their dairy products from the store the same way as urban dwellers.

Under a system of supply management begun in the early 1970s, each province in Canada is allocated a portion of the national quota for industrial milk, that is, milk used for the production of butter, cheese, cottage cheese, yogurt, powdered milk, and ice cream. Manitoba's share of the national industrial quota has been just less than 4 percent in recent years.

Provincial producers' groups then estimate the requirement for fresh milk and cream for direct

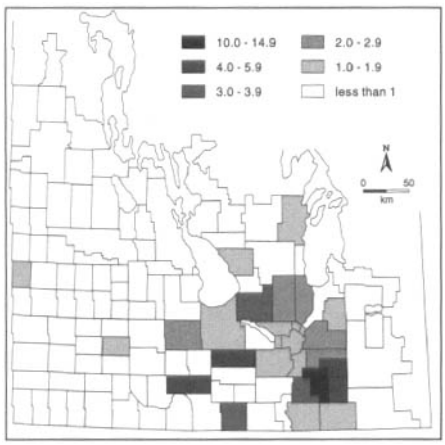

Figure 15.8 Percentage of the Manitoba Fluid (Whole) Milk Quota by Census Subdivision, 1990 (Source: The Manitoba Milk Producers' Marketing Board, Winnipeg)

consumption and add this to the industrial allocation to arrive at an overall quota. The producers' groups distribute this quota among individual dairy producers, of which there are two main types: producers of fluid (whole) milk and producers of farm-separated cream for butter production.

In Manitoba, the Manitoba Milk Producers' Marketing Board is responsible for determining and allocating the overall milk quota. In recent years, about 80 percent of the provincial industrial-milk quota plus the entire quota for fresh milk has been allocated to producers of fluid milk. The milk is normally picked up every two days at the farm by the board, which then transports it either to industrial plants for processing or to dairy companies in the larger urban centres that sell it directly to consumers or retailers. In recent years, about half the fluid milk handled by the board has been marketed as fluid milk, and half has been processed.

The 1,000 or so commercial producers of fluid milk in Manitoba are geographically concentrated in several main areas (Figure 15.8). The main concentrations are all close to Winnipeg, the province's main consuming centre for fluid milk and processed dairy products. Proximity to Winnipeg was much more important as a causal location factor in the past, when transportation was slower and relatively costlier than today, and when refrigeration was less fully developed. However, even though fluid milk can now be moved long distances at relatively low cost without spoilage, the earlier pattern of production has continued.

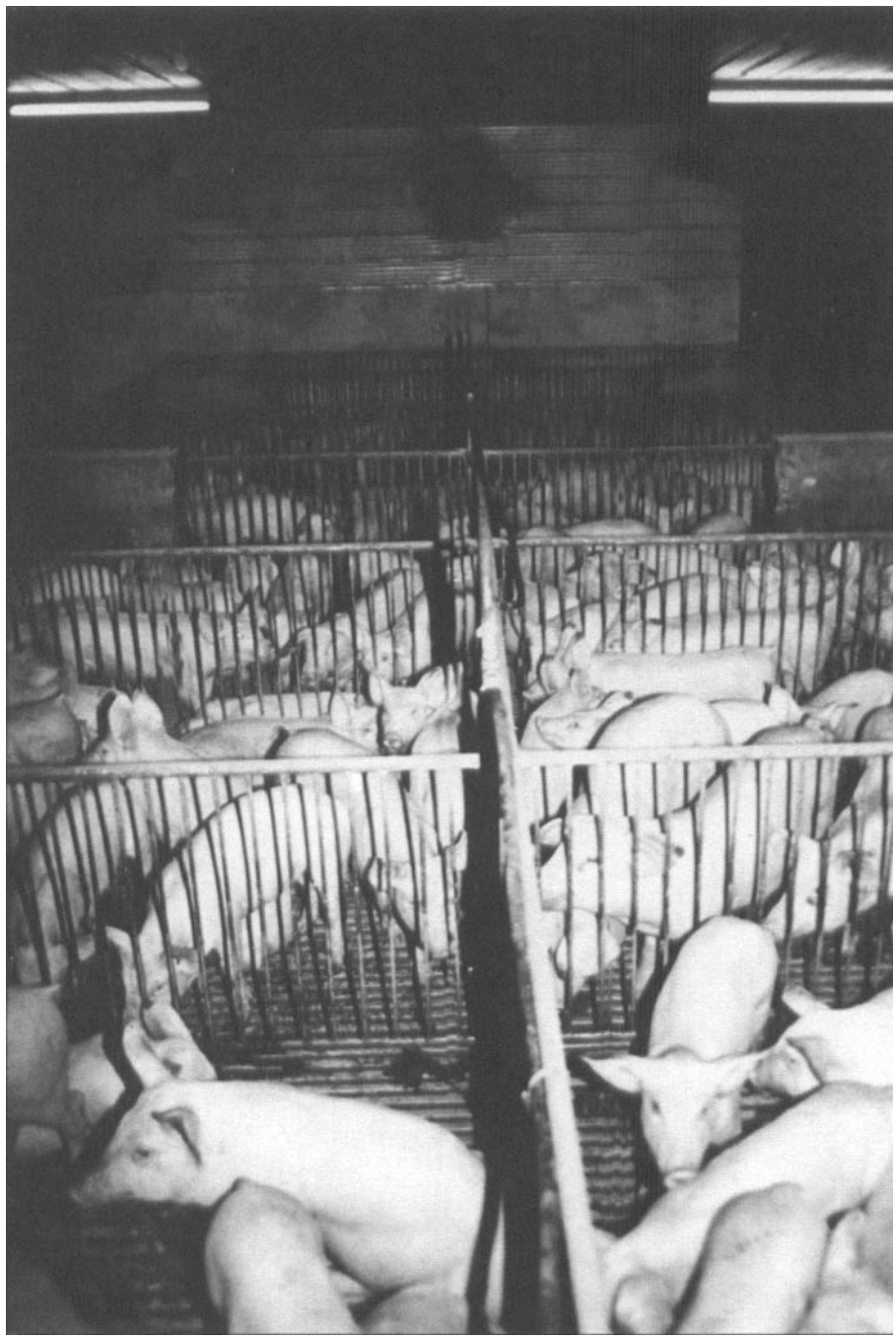

Figure 15.9 Large Hog Barn in the Interlake Region. The intensive nature of modern pork production is apparent here. (Photograph: Farm Business Communications, *UGG, Winnipeg)*

Except for a relatively small number of dairy farms located on high-quality and high-priced land near the largest urban centres, notably Winnipeg and Brandon, fluid-milk producers tend to be located on land of variable quality where the better land is used for grain production and the marginal land is devoted to pasture, hay, and fodder or ensilage crops for the dairy herd. If present, very poor land is used as unimproved pasture for young dairy cattle or beef cattle. Hog or poultry units may also be present. Thus, in general, dairying is only one of several enterprises in a mixed crop-and-livestock operation.

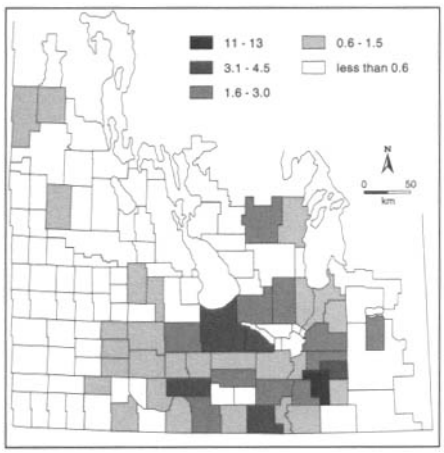

Figure 15.10 Percentage of the Total Hogs Marketed in Manitoba by Registered Producers, by Census Subdivision, 1989 (Source: Manitoba Pork, Winnipeg)

Large supplies of water at one site are also desirable, especially where herds are large, because dairy cows are restricted to limited areas and require more water per unit of weight than other types of livestock or poultry.

Land with all these general requirements — a location near Winnipeg, variable quality conducive to mixed farming, and adequate water supplies — is most concentrated in an arc that begins just east of the Red River Plain in the Vita-Stuartburn area, curves northwestward through the La Broquerie-Grunthal-Steinbach district, and extends into the southern Interlake, with an eastern outlier near Whitemouth (Figure 15.8). In 1990 this area had 45 percent of the provincial whole-milk quota, whether the milk was sold fresh or processed.[10]

Even within this area, dairying is carried out to a disproportionate degree by Mennonites, as indicated by the allocation of 13.4 percent of the total whole-milk quota in 1990 to farmers in the largely Mennonite rural municipality of Hanover (Figure 15.8). Probable reasons for this are that Mennonite farm families tend to be large, hence providing the considerable amount of labour still needed on dairy farms, and farms tend to be small, making it desirable to have intensification and diversification of some form, including dairying.[11]

Farmers of French origin in the Ste. Anne-La Broquerie area are also highly represented for similar reasons. Outside this main area, fluid-milk production is concentrated on marginal lands of the Assiniboine Delta in the vicinity of St. Claude and in the Pembina Hills in the Notre Dame de Lourdes–Somerset-Mariapolis-Bruxelles district (Figure 15.8). Farmers of French and Belgian origin, whose ancestors handed down to them a tradition of dairying, are important producers in these areas.

The predominantly Mennonite Morden-Winkler area is another district of significant production. About one-half of the approximately 81 Hutterite colonies in Manitoba have milk quotas. Although dairying is not one of their main enterprises, it does provide a form of intensification and diversification, and it makes use of the large supply of labour in the colonies (Case Study 15.1 on page 233).

Seventeen percent of the industrial-milk quota for Manitoba is allocated to producers who separate whole milk into cream and skim milk on their farms, and ship the cream to local creameries where it is made into butter. Butter is also made from fluid milk transported to processing plants by the Manitoba Milk Producers' Marketing Board, but the fluid-milk producers merely produce for the fluid pool and are not specifically cream producers.

The production of farm-separated cream and creamery butter has declined dramatically in recent years. The more than 8,000 producers in Manitoba in the early 1970s have been reduced to about 1,000, and the number of creameries has declined from more than 40 to only 13. Cream producers tend to have small herds of about five cows, and cream production is usually only a minor element of several enterprises on the farm. Cream producers tend to be located on marginal agricultural land in districts farther away from the main urban markets than fluid-milk producers.

Pigs and Poultry

Pig and poultry farming in Manitoba have several aspects in common. Both pigs and poultry are produced largely by modern methods of factory farming, in which the livestock are confined virtually throughout their lives to barns or sheds. In both cases a small number of large-scale producers account for the bulk of the output (Figure 15.9).

On the most specialized farms, which also tend to produce large numbers, much of the feed is purchased, and some farms have little more land than that required to house the pigs or poultry. Partly because of this, neither enterprise is closely associated with particular types of soil or land uses. Also, Mennonites and Hutterites together produce the bulk of the Manitoba output of hogs, chickens, hen eggs, and turkeys.

Hogs

Some farmers produce hogs for slaughter but purchase the pigs as weanlings from other farmers who breed them, other farmers raise the pigs from farrow (birth) to finish (slaughter as hogs), and some do both. This discussion focuses on the output of hogs, regardless of which method is used.

Manitoba Pork is a producers' group that controls the marketing of all the hogs produced by registered producers in Manitoba, 1.7 million hogs in 1990. Hog output in the province has become increasingly concentrated in a relatively few large-scale production units. In 1990, 747, or about one-third of the 2,335 registered producers, marketed 500 or more hogs each, and these producers accounted for 88.5 percent of the total marketings in Manitoba.[12]

The geographical pattern of hog production in Manitoba appears to have little direct relationship to physical factors such as climate or soil, or to types of crops grown, other than the general suitability of southern Manitoba for producing barley, the main feed for hogs. The concentration in the south-central part of the province, in and near the Red River Plain, is largely explained by the fact that the Hutterites and Mennonites account for the bulk of the production, so the pattern of marketings broadly reflects the distribution of these two groups (Figures 15.10 and 15.11).

Virtually every Hutterite colony in Manitoba has a hog operation,

usually a large one. On many, if not most, colonies hogs are the economic mainstay. The colonies, each of which is considered to be a single production unit, accounted for only 86 of the 2,335 registered producers in 1990, but collectively they were responsible for 35.6 percent of the total registered hog marketings in Manitoba.[13] This is remarkable in itself, but even more so is the fact that Hutterites form only about 6 percent of Manitoba's farm population, and their share of the farmland is a relatively meagre 1.75–2.0 percent.

The Hutterites have emphasized intensive forms of livestock and poultry farming as a means of supporting a large population compared with the available land base. In addition, a variety of farm enterprises on each colony spreads risk, fully uses the sizable labour supply, and provides important management positions for most adult males, such as pig boss, chicken boss, goose boss, or turkey boss. Concentrating on hog production has an added advantage because it is not under the quota system, unlike dairying and most types of poultry production. Recently, the Hutterites have gone beyond mere production of hogs by building a hog-slaughtering facility, Springhill Farms, near Neepawa. Under an agreement with Olympia Meats, 10,000–11,000 hogs are slaughtered weekly at this facility and shipped to the province of Quebec.

The Mennonite contribution to hog output in Manitoba is not precisely known, but an estimated one-third to two-fifths of total marketings are by this group.[14] A tendency towards large families and attachment to agriculture has produced an inordinate number of small farms among the Mennonites. To stay on the land under such circumstances requires intensive forms of agriculture, such as hog production and poultry enterprises, singly or in combination, as supplements to or supplemented by grain growing or dairying.

As with dairying, the Mennonite area southeast of Winnipeg, centred on the rural municipality of Hanover, is the district of greatest hog production (Figures 15.10 and 15.11). Much of the land in this general area is not as highly suited to production of cash grain and special crops as the Mennonite area west of the Red River. Intensive hog production is one way to make a living on small areas of marginal land, especially if most of the feed is purchased. Alternatively, hog production can be combined with grain farming on better soils to increase output per unit of land.[15]

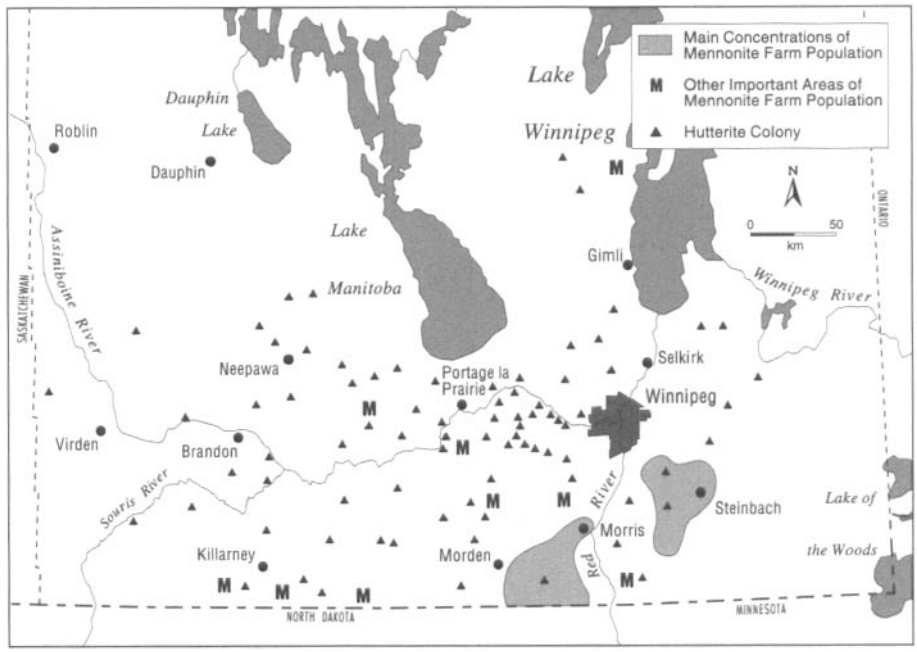

Figure 15.11 Hutterite Colonies and Main Concentrations of Mennonite Farms, 1990

An interesting recent development has been the establishment of a pig farm near Malonton in the southern Interlake region by the Japanese firm Minebea, whose main interest is the manufacture of ball bearings, computer parts, and calculators. The initial purpose of the farm was to produce high-quality breeding stock for export to Japan, other parts of Asia, Central and South America, and the United States. In the longer term, the company hopes to produce up to 1,000 hogs a week for export by air, mainly to Japan.

In a statement that reveals much about modern methods of hog production, a representative of Minebea was recently quoted as saying, "Pig production is just exactly the same as the manufacturing business. . . . Particularly with our automated systems it will be just like manufacturing."[16]

Poultry

All the main types of poultry production in Manitoba are regulated by national supply management systems of quotas, similar to those for dairying. National bodies decide what proportion of the national quota for chicken broilers and roasters, chicken eggs, and turkeys is allocated to Manitoba; within the province, boards elected by producers' groups distribute the provincial quotas among individual farmers (Table 15.2). From a geographical standpoint, the main effects of the quota systems are to make more permanent the patterns of production within Manitoba because prospective new producers are kept on waiting lists, and production is spread over a larger number of units than if the current larger units were allowed to capture ever-larger shares of the market.

The quota system notwithstanding, factory-farming methods have led to the concentration of the bulk of poultry production in a small proportion of farms that have some poultry, even though these farms are themselves relatively few compared with the total number of farms in Manitoba (Table 15.2).

Chicken Broilers and Roasters

Up to 1,000 chickens annually can be raised for meat on a farm without a quota being required. There are more than 2,000 such unregistered producers in Manitoba, but they account for only about 5 percent of the total output. Almost all

Table 15.2 Poultry and Egg Production in Manitoba, 1990

Product	Manitoba's Percentage of the National Production Quota	Number of Registered Producers	Production by Registered Producers (millions)	Estimated Total Production (millions)	Number of Farms Reporting Production (1986 Census)
Chicken meat	3.91	136	21 kg[1]	22.1 kg[1]	2,392
Turkey meat	7.60	84	9 kg[1]	9.2 kg[1]	454
Chicken eggs[2]	11.41	235	48 dozen	50.5 dozen	2,198

Notes:
1. Eviscerated weight
2. Eggs for consumption as fresh eggs or for processing; does not include hatching eggs.

Source: Data obtained from marketing boards and Statistics Canada.

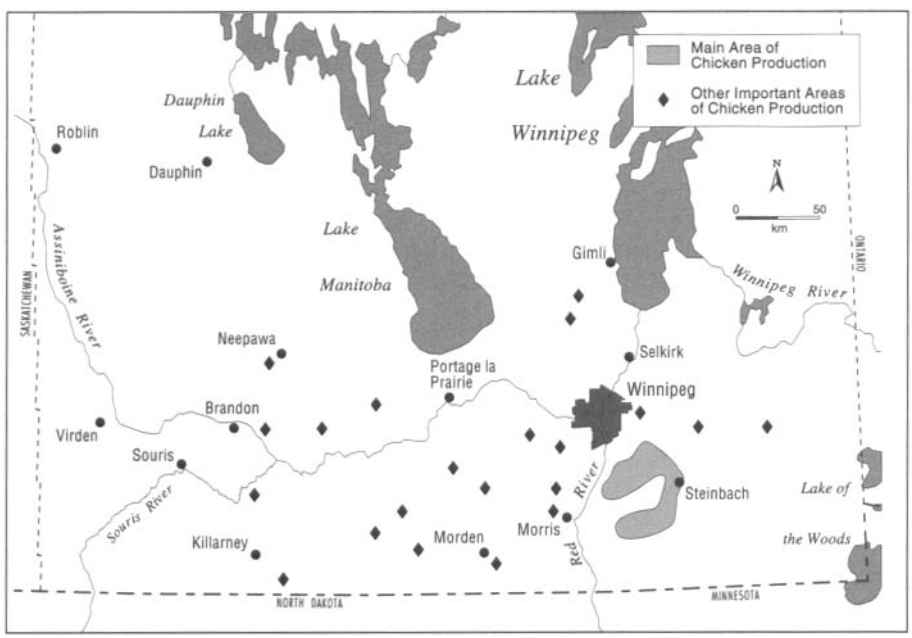

Figure 15.12 Main Areas of Chicken Broiler and Roaster Production (Source: Based on information provided by the Manitoba Chicken Broiler Producers' Marketing Board, Winnipeg)

of the production comes from the 136 registered producers on quota (Table 15.2).

Some 60 percent of registered producers, accounting for more than two-thirds of total production, are located east of Highway 75 and south of Highway 1 east of Winnipeg. Mennonite farmers in and near their former East Reserve, now the rural municipality of Hanover, are the dominant producers in this region. Some "corporate" units such as Friendly Family Farms, Dunn Rite, and Canada Packers, operated by non-Mennonites, are individually large (Figures 15.11 and 15.12).

Elsewhere, production units are more scattered, although there are large corporate producers near Neepawa, Morris, and Portage la Prairie, and there is some concentration in the largely Mennonite Morden-Winkler-Altona area. Only 10 Hutterite colonies have quotas, perhaps because the Hutterites in general were not heavily engaged in chicken production when the quota system was introduced in the 1970s and it is difficult to obtain a quota.

Overall, the Mennonites (50–60 percent), large corporate producers (20 percent), and Hutterites (5 percent) account for between 75 and 80 percent of the total output.[17]

Turkeys

Traditionally, turkey production in Canada has been both highly seasonal — mainly for the Christmas season, followed by Thanksgiving — and almost entirely in the form of whole turkeys. While these traditions continue, producers' groups have had considerable success in recent years in spreading the demand for turkey meat more evenly throughout the year.

This change has been achieved mainly by the marketing of turkey parts and processed turkey — now the outlet for close to 25 percent of Canadian turkey production. The availability of these new forms of turkey and an increasing awareness among consumers of the nutritional benefits of turkey meat have been important factors, along with the development of export markets. In 1991–92 approximately 400,000 kg (eviscerated weight) of turkey meat was exported from Manitoba to locations as far-flung as Hong Kong, St. Lucia, and South Africa. The export market is being actively pursued by the Manitoba Turkey Producers' Marketing Board.

Of the 84 registered turkey producers, 18 are Hutterite colonies and collectively account for 28 percent of Manitoba's total output. Mennonites account for some 50– 60 percent of the total, with production concentrated southeast of Winnipeg in areas similar to those for chickens. As with chickens, the main processing plants are located in Steinbach, Blumenort, and Winnipeg.

Chicken Eggs

Winnipeg is the main market for fresh or "shell" eggs in the province, and it is also the principal centre for the processing of eggs into egg powder, baked goods, mayonnaise, and shampoo. Proximity to this major market may have contributed to the concentration of egg production in south-central Manitoba in the past, because such a location reduced transport costs, provided relatively

fresh eggs to consumers, and reduced breakage during transport and handling. However, the dominance of this general area today appears to be an outcome of the quota system, perpetuating the earlier general pattern (Figure 15.13).

Even within south-central Manitoba, egg production is highly localized. To a large extent, the main areas or pockets of high production are in districts dominated by Mennonites or on Hutterite colonies (Figures 15.11 and 15.13). Egg production is especially attractive to members of these two groups because the adoption of modern factory-farming methods has made this enterprise very intensive; 10,000 laying hens in a barn 60 m long is a typical operation.

The areas of longstanding Mennonite settlement on both sides of the Red River, particularly the rural municipality of Hanover, are the main centres of production (Figure 15.13). Indeed, Mennonite farmers produce an estimated 50–60 percent of the total output of registered producers. Sixty Hutterite colonies, or about 25 percent of the 235 registered producers, together account for about 30 percent of the Manitoba total.[18]

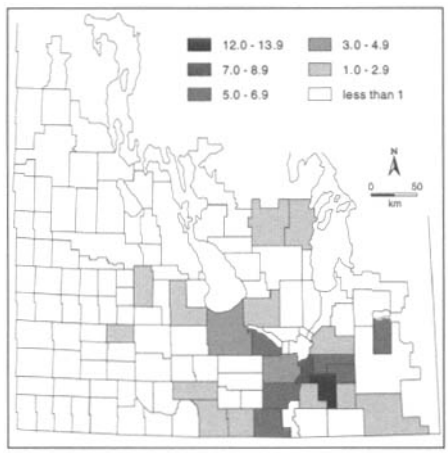

Figure 15.13 Percentage of the Total Manitoba Hen Quota by Census Subdivision, 1990 (Source: Manitoba Egg Producers' Marketing Board, Winnipeg)

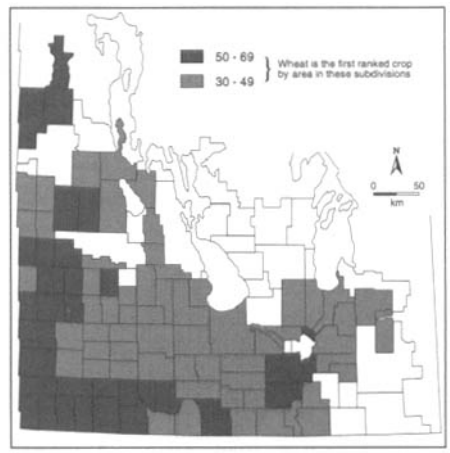

Figure 15.14 Wheat as a Percentage of Land in Crops by Census Subdivision (Source: Statistics Canada, unpublished data from the 1986 census)

CROPS AND PASTURE

In recent years, crops have accounted for approximately 60 percent of the total value of farm production in Manitoba. At the 1986 census about the same proportion of farms received their main income from crops (Figure 15.5 and Table 15.1). Soil permitting, all the main crops can be grown throughout the agricultural zone of southern Manitoba. Each crop, however, has its own pattern of distribution, with relatively heavy concentrations occurring in some areas and less in others.

Grains

To many people throughout the world, Manitoba is known mainly for its grain production, especially wheat. This reputation as a major grain-growing district is well deserved, but it would be a mistake to conclude that physical conditions for the commonly grown grain crops are necessarily better in Manitoba than agricultural regions not well known for producing them.

It is true that the grassland (chernozemic) soils of Manitoba are naturally fertile and stand up well to the demands of grain crops; that the timely spring rains followed by hot, sunny, and dry summer conditions promote yields; and that the flat to gently undulating topography is suited to the use of large-scale mechanized equipment. That said, the dominance of specific grain crops, notably wheat, barley, and oats, is partly the result of a climate that does not allow widespread commercial production of other types of temperate zone grain crops such as corn; and, of course, none of the tropical and subtropical grain crops can be grown at all.

Furthermore, yields of the main grain crops grown in Manitoba are substantially lower than in moister areas. For example, wheat yields are higher in southern Ontario and, indeed, just before the middle of the 19th century, southern Ontario was the "breadbasket" of Canada.[19] Yet little wheat is now grown in Ontario because the climate allows more financially rewarding agricultural enterprises, given the nearness to large urban markets.

In summary, it is largely because the climate is so restrictive and there are limited alternatives because of a sparse provincial and regional population that wheat, barley, and other small grains are so dominant in Manitoba. At the same time, the relatively dry climate does produce grains with a high protein content and, in the case of hard spring wheat, excellent breadmaking qualities that are in demand in distant markets.

Wheat

Spring wheat is the main crop on the best agricultural soils in Manitoba (Figures 15.7 and 15.14). In 1986 wheat accounted for half or more of the total cropland in the southwestern and western parts of the agricultural zone, including large tracts of the Boissevain and Minnedosa-Reston Till Plain, the Valley River Plain near Dauphin, and the Swan River Plain. Elsewhere, although wheat was the leading crop in many districts, it accounted for more than half the cropland only in a small part of the Red River Plain southwest of Winnipeg (Figure 15.14).

There are several possible reasons for these patterns of concentration on wheat or, viewed another way, wheat's relative lack of importance in some areas. Soils in the Interlake, Westlake, and much of the southeast are generally not suitable for extensive wheat farming, and the land in cultivation is devoted mainly to tame hay, pasture, and feed grains such as oats and barley to support livestock and poultry enterprises. Wheat is the first-ranked crop by area in the Red River Plain, and a large proportion of the wheat produced in Manitoba is from there, but the region is so well suited to a

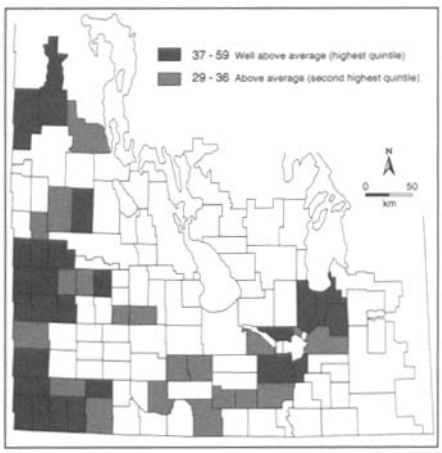

Figure 15.15 Wheat Farms as a Percentage of all Farms by Census Subdivision (Source: Statistics Canada, unpublished data from the 1986 census)

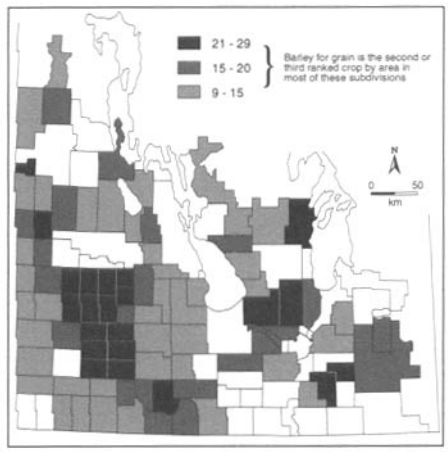

Figure 15.16 Areas of Barley Grown for Grain as a Percentage of Land in Crops by Census Subdivision (Source: Statistics Canada, unpublished data from the 1986 census)

variety of crops that in most districts wheat does not usually reach 50 percent of the total cropland.[20] The exception, the area southwest of Winnipeg, may well have more land in wheat because it was settled later than surrounding districts, and by farmers interested in large-scale wheat farming.[21] On the higher and slightly cooler land sloping southward from Riding Mountain to the Assiniboine Valley, a high percentage of the land is sown to barley, which is more tolerant than wheat to a shorter growing season. Hence wheat's relative importance is reduced (Figure 15.15).

In the southwest and west, wheat reaches its highest relative importance by area probably because of a dry climate, which boosts the protein content of wheat and, together with a short frost-free period, limits the range of available commercial crops that might compete with wheat. Another influence on present-day cropping patterns may be the initial settlement of the southwestern corner of Manitoba mainly by farmers from Ontario, who were familiar with, and had a predilection towards, wheat farming.[22]

Barley

Among the grain crops grown in Manitoba, barley is second only to wheat in terms of area sown and value of production. Unlike wheat, which is largely consumed directly by humans after processing into flour, macaroni, and other products, most of the barley is fed to livestock and the flesh of the animals is then eaten by humans. A small but not insignificant proportion of the barley crop is used for malting in the production of beer rather than as a feed grain.

Barley is more adapted than wheat to a range of climatic conditions. Although it exceeds wheat production in only a few localized districts in Manitoba, it is a close second to wheat over extensive areas where the frost-free season is short, notably on Minnedosa-Reston Till Plain, and where there is an emphasis on livestock, such as in the Steinbach district and parts of the Interlake (Figure 15.16).

Many farmers sow malting varieties of barley in the hope of having their crop selected for malting, which gives considerably higher returns than feed barley. However, only a small proportion of the malting barley sown is suitable for the malting process, and much of the barley is actually used for feed.[23] Barley suitable for malting tends to be grown in the cooler and moister but well-drained zones of southern Manitoba, that is, towards the west-central and northern parts of the agricultural zone. Such barley is generally lower in protein and higher in starch than the feed barleys, properties that enhance its malting quality.[24]

Other Grains

Oats, corn for grain, rye, and mixtures of various grains sown together are relatively minor crops compared with wheat and barley. Their principal use is as livestock feed.

Oilseeds

Other than the recent precipitous decline in summer fallow, the most significant change in land use in Manitoba since World War II has been the rapid increase in oilseed production (Figures 15.3 and 15.4). Although flaxseed has been an important crop in Manitoba since the late 1800s, commercial production of both canola and sunflowerseed began only in the early 1940s, partly in response to the lack of imported edible oils from tropical and other warm climates during wartime.[25] The wheat glut of the 1960s further boosted oilseeds as a cash crop, and in recent years there has been increasing demand for oilseeds at home and abroad, especially in Japan.

Flaxseed

Flax may well have first been domesticated for its fibre — linen — but in Manitoba it is cultivated primarily for its oil, with the straw being merely a by-product for paper production. Unlike canola and sunflowerseed, which are used mainly to produce cooking and salad oils, margarine, and shortening, flaxseed oil is used almost entirely for industrial purposes, in the making of paints, varnishes, printing inks, linoleum and oilcloth, putty, and plastics.[26] Linseed meal is high in protein and is used for feeding some types of livestock.

Flaxseed has a limited root system that tends to restrict the crop to silty and clay-loam soils, which hold moisture well. The better-drained soils of the Red River Plain and loams developed on shale-rich till on the Boissevain Till Plain are particularly suitable (Figure 15.17). A trip through these main producing districts in summer is enlivened by fields of blue flax flowers, which are especially striking if interspersed with yellow fields of canola or sunflowers, and by breadloaf-like stacks of flax straw looming large on the horizon.

Canola

Canola, as the particular varieties of rapeseed grown on the Prairies

are known, is grown throughout the agricultural zone of Manitoba. It is, however, best suited either to cooler areas with more moisture than is generally available or, in drier areas, to heavy soils that retain moisture well (Figure 15.18).

Most of the canola produced in Manitoba is marketed as seed through the elevator system and moved to other parts of Canada or abroad for crushing and refining into an oil. The remainder is crushed within the province at either Harrowby (near Russell) or Altona, although only at the Altona plant is the crude canola oil refined into edible oil. Canola oil is used as a general-purpose edible oil for frying, baking, salads, and the manufacture of margarine. A by-product of the crushing process is canola meal for livestock feed.

Sunflowerseed

Long before sunflowers were grown commercially for oil production in Manitoba, they were grown on a limited scale in gardens as a confectionery by the Mennonites, who brought sunflower seeds with them from Russia in the late 1800s. It is perhaps fitting, therefore, that it was the Mennonites, in and near their former West Reserve, who began commercial production of sunflowers during World War II.

The long frost-free season and large number of accumulated heat units, together with the silty-clay to loamy-sand soils of the general area were highly suitable for sunflowers. These physical conditions, along with the desire of Mennonite farmers to diversify crop production, soon led to a viable sunflower-oil industry, especially after a crushing plant was built at Altona in 1946.[27]

Since then, sunflowerseed production has had a somewhat checkered development, with years of high production being followed by those of low output. In recent years, production has spread beyond the early area of output, and a proportion of the crop has been marketed through the elevator system as well as at the local crushing plant at Altona. While sunflowerseed ranks third as an oilseed crop in Manitoba after canola and flaxseed, Manitoba ranks first among all provinces in Canada as a producer of both sunflowerseed and flaxseed. Indeed, in 1986 Manitoba had 79 percent and 55 percent of the total area in Canada sown to sunflowers and flax, respectively.

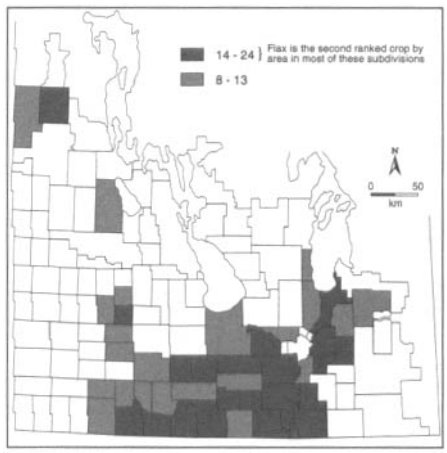

Figure 15.17 Flax as a Percentage of Land in Crops by Census Subdivision (Source: Statistics Canada, unpublished data from the 1986 census)

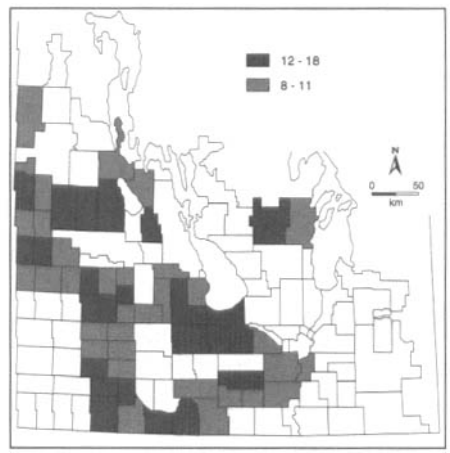

Figure 15.18 Canola as a Percentage of Land in Crops by Census Subdivision (Source: Statistics Canada, unpublished data from the 1986 census)

Tame Hay and Pasture

In the southeast, the Interlake, Westlake, and adjacent to the Riding and Duck Mountains, most of the farmland is unimproved pasture or woodland, and much if not most of the land that is improved is sown to tame hay or pasture (Figure 15.19). On the poorest land, beef cattle are raised, frequently on extensive ranches, and on the better marginal land dairying is a main enterprise. On some farms, especially those with few or no livestock, alfalfa for seed is the main source of cash income. On such farms it is common to see fields dotted with wooden boxes of close to human height that house leafcutter bees, which are kept to pollinate the alfalfa.

Special Crops and Vegetables

The term "special crops" refers to crops that have only recently been raised commercially on Manitoba farms, including canola, sunflowers, soybeans, field peas, sugar beets, mustard, coriander, various types of beans, lentils, canary grass seed, and corn for grain. Other than canola and, in some years, sunflowers, these crops are grown only to a small extent because of limited demand or lack of suitable climate and soils. Vegetables are likewise limited and are grown commercially either for processing or the fresh market. Many crops are grown on contract. Although each crop has a unique areal distribution, most are concentrated within the Red River Plain. A few of the most important ones will be examined further.

Sugar Beets

Commercial production of sugar beets began in earnest in Manitoba with the opening of the Manitoba Sugar Company refinery in south Winnipeg in 1940. Beets are costly to transport relative to their value, and initially they were grown fairly uniformly within about 100 km of Winnipeg. Experience proved, however, that beets were unsuitable for heavy clay soils, and production became progressively concentrated on medium-textured soils. By the late 1950s, most of the beets were grown on such soils in the Morden-Winkler-Altona area, with other concentrations near Steinbach and in the Oakville–Portage la Prairie district. Mennonite farms accounted for the bulk of the production, partly because they had the necessary labour and were searching for intensive crops as alternatives to grain.[28]

In recent years, the number of farmers on beet contracts has declined although production has not, and beet growing has become far less labour-intensive. The general patterns of production have changed lit-

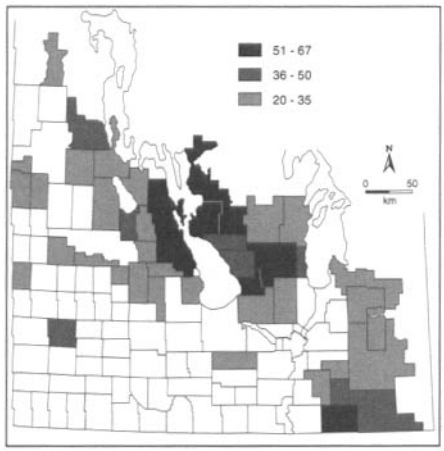

Figure 15.19 Tame Hay and Improved Pasture as a Percentage of Total Improved Land by Census Subdivision (Source: Statistics Canada, unpublished data from the 1986 census)

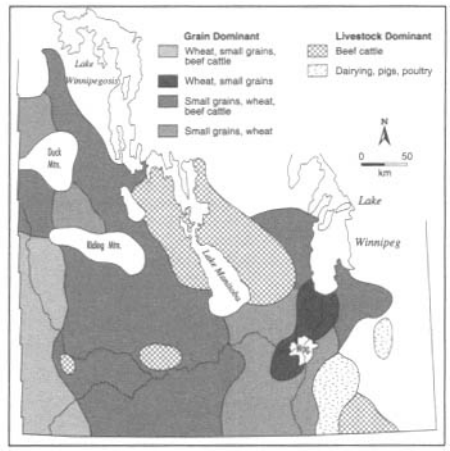

Figure 15.20 Agricultural Regions of Manitoba (Source: Statistics Canada, unpublished data from the 1986 census)

tle since 1960, and Mennonite growers in the southwestern part of the Red River Plain still dominate, often taking over their parents' contracts.[29] In Canada, sugar beets are now produced only in Manitoba and Alberta, with Manitoba having the larger share.

Potatoes for Processing

Manitoba ranks third in Canada after Prince Edward Island and New Brunswick in area sown to potatoes. Some of the potatoes are for the table market, but the bulk are for processing. Some 100 growers, most of whom are members of the Keystone Vegetable Producers' Association, produce for the processing market on contract with Carnation Foods (now owned by Nestlé), which operates a plant near Carberry; with McCain, whose plant is in Portage la Prairie; or with both.

Both companies produce mainly frozen french fries and dehydrated potatoes. Growers are concentrated in areas of silty to sandy soils near both processing plants, as well as in the vicinity of Carman and in the Morden-Winkler-Plum Coulee district.[30] An additional four growers produce potatoes on contract with Old Dutch in Winnipeg, whose main product is potato chips. To better ensure a reliable crop, an increasing number of potato growers have installed irrigation systems, especially in the Carberry area, with water drawn from the Assiniboine Delta Aquifer (Chapter 18).

Fresh Vegetables

Until the late 1930s, gardening for the fresh market was almost entirely located along the banks and flats adjacent to the Red and Assiniboine rivers at what was then the outskirts of Winnipeg.[31] Since then, the expansion of Winnipeg, increased mechanization on larger fields, and better and faster transportation have led to a shift away from Winnipeg, primarily to light sandy to silty soils near sources of irrigation water in the Portage la Prairie area, and further north and south along the Red River near Winnipeg.

All sizable growers of table potatoes, onions, parsnips, rutabagas, and carrots are members of, and are assigned quotas by, the Manitoba Vegetable Producers' Marketing Board, which also arranges for the processing and marketing of these crops. The board will also process and market the more perishable vegetables such as celery, lettuce, tomatoes, cauliflowers, and cabbage, but growers of these crops are not under quota and can dispose of their crops themselves.

Other Crops

The climate of Manitoba restricts commercial fruit production to a very few favoured areas. In recent years, "u-pick" berries have attracted urbanites to rural areas. A noticeable concentration of strawberry production has developed near Portage la Prairie, which now holds an annual strawberry festival. Flowering plant and ornamental shrub nurseries, mushroom farms, and lawn-sod farms are concentrated near Winnipeg.

CONCLUSION

Consideration of the geographical patterns of individual crops and types of livestock gives an incomplete picture of Manitoba agriculture. It is rare in Manitoba for an individual farm to gain its entire income from a single crop (monoculture); while some farms depend on only one livestock enterprise, most of them also raise feed or forage crops. The typical Manitoba farm is diverse, and often changes its production patterns from year to year in response to market demand and weather conditions.

Statistics Canada classifies farms into several main types according to estimated sources of income (Table 15.1). These data are available by census subdivision and form the basis of a map of agricultural regions (Figure 15.20). The dominance of crops, especially grain crops, as sources of income on Manitoba farms is clearly evident. Farms on which grain forms the main source of income predominate in all the districts of good agricultural land (Figures 15.7 and 15.20). Wheat farms — farms on which 51 percent or more of the estimated income is derived from sales of wheat — are the main type in the southwest and parts of the Red River Plain.

In most districts of good farmland, however, wheat alone does not provide more than half the income; small grains in combination — wheat, barley, oats, rye, and others — are the mainstays on most farms (Figure 15.20). Beef cattle are an important source of income on many farms classified as wheat or small-grain farms, and they are the main source of income in pockets of poor land in the grain-growing districts. Many grain farms also grow oilseeds, and some include potatoes, sugar beets, peas, and other special crops in their rotations.

Livestock farms dominate in marginal and submarginal agricultural districts. Beef cattle farms or ranches tend to be single-enterprise

operations, but the other three types are usually more diverse: a farm classified as a poultry or dairy farm may also derive significant income from hogs, or a farm on which more than half the income is from hogs may also grow wheat and canola.

Perhaps most important from a geographical standpoint is that these crop and livestock assemblages, together with the physical environment, produce varied landscapes in southern Manitoba. In the Red River Plain almost all the land is cropped, and the crops are varied. Even over a short distance during the summer months, a traveller will pass fields of wheat, barley, oats, and canola, and in some districts flax, sunflowers, corn, potatoes, and sugar beets as well. Livestock are not frequently seen; there are few beef or dairy cattle and the pigs and poultry are in barns and sheds. The land is generally flat, trees are few, and the sky is dominant.

Southeast of the Red River Plain is a region dominated by livestock enterprises (Figure 15.20). Fields of grain (barley for feed and corn for feed or silage are common), pasture, and hay are interspersed with bush. Grain elevators are few, and their verticality is replaced in the main trading centres by feed mills and in the dairying districts by metal or concrete silos (Figure 15.21). Low sheds are frequently seen; whether they house pigs or poultry is not apparent to the passer-by.

Moving even further southeast into the Stuartburn district, one sees that the landscape is more and more dominated by rough pasture, bush, meadow, and swamp. Herds of beef cattle lying in the shade of trees near a water hole are a common sight on a hot summer's day, as are fields dotted by large, cylindrical hay bales. Similar landscapes are found in the western Interlake and Westlake regions.

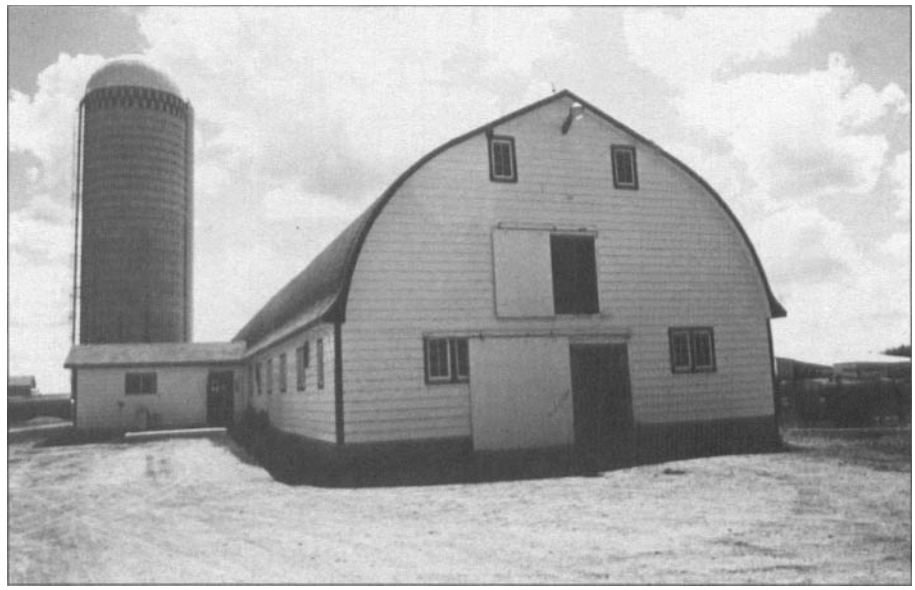

Figure 15.21 Dairy Barn and Cylindrical Silo. Scenes such as this are common in the main dairy region of Manitoba southeast of Winnipeg. (Photograph: Farm Business Communications, *UGG, Winnipeg)*

In the agricultural districts west and south of Lake Manitoba, the crop assemblages are less varied than in the Red River Plain; beef cattle are far more numerous, but commercial poultry or pig operations are uncommon. The landscape is enlivened by undulating-to-rolling topography, sometimes providing panoramic views. Sloughs are dotted about, adding further variety to the landscape. Perhaps the most attractive agricultural landscapes in Manitoba are located in the main glacial spillways, such as the Pembina, Little Saskatchewan, and Birdtail Valleys; on the morainic hills between Morden and Brandon; and near the main mountain and hill masses in the northwestern parts of the agricultural zone.

These agricultural landscapes are unlikely to change in any significant way by the end of the millennium. Spring wheat will continue to be the most important crop, followed by barley and canola. Oilseeds as a group will continue to be secondary to grain crops. Vegetables and special crops will be locally important in much the same districts as they are today.

Laying hens and chicken production will be concentrated in fewer and larger units, but the geographical patterns of production should remain much the same. Fluid-milk production will still be concentrated near Winnipeg, especially southeast of it, although the number of producing units will continue to decline. Beef cattle and hogs will continue to be the main sources of income from livestock. Unusual and exotic forms of livestock production — ostriches (for meat and leather), bison, elk, pheasants — will attract attention but will be relatively insignificant.

NOTES

1. D.B. Grigg, *The Agricultural Regions of the World* (Cambridge: Cambridge University Press, 1974), 8–16, 152–86.
2. B. Kaye, "Historical Geography of the Red River Settlement from 1812–1870" (M.A. thesis, University of Manitoba, 1967); and J.H. Ellis, *The Ministry of Agriculture in Manitoba* (Winnipeg: Queen's Printer for Manitoba, 1971), 11–49.
3. Here one livestock unit is taken to be: 1 horse, 1 milk cow, 1.33 other cattle, 5 pigs, 7 sheep, 80 geese, 80 turkeys, 90 ducks, or 100 hens or chickens.
4. University of Manitoba, Faculty of Agriculture, *Principles and Practices of Commercial Farming* (Winnipeg: University of Manitoba, Faculty of Agriculture, 1977), 91.
5. Manitoba Agriculture, *100 Years of Agriculture in Manitoba, 1881–1980: A Statistical Profile* (Winnipeg: Manitoba Agriculture, n.d.), 101.
6. Statistics Canada, *Manitoba: 1986 Census of Agriculture* (Ottawa: Minister of Supply and Services, 1987), xiii, table 19.
7. The discussion of farm enterprises and types focuses on the main agricultural zone of Manitoba. As defined here, this zone contains at least 98 percent of the total farmland in the province.
8. T.R. Weir, ed., *Atlas of Manitoba* (Winnipeg: Surveys and Mapping Branch, Province of Manitoba, 1983), 102.
9. M. Rutulis and J. Mamott, *Aquifer*

Maps of Southern Manitoba: Map 1 — Bedrock Aquifers, Map 2 — Sand and Gravel Aquifers (Winnipeg: Department of Natural Resources, Province of Manitoba, 1987).
10. This statement is based on detailed data on the distribution of milk quotas obtained from the Manitoba Milk Producers' Marketing Board in Winnipeg.
11. W.J. Carlyle, "Mennonite Agriculture in Manitoba," *Canadian Ethnic Studies* 13(1981):72–97.
12. *Manitoba Pork Twenty-Sixth Annual Report, 1990* (n.p.: Manitoba Pork, n.d.), 13.
13. Ibid. Not all of the 86 Hutterite production units registered with Manitoba Pork are fully established colonies. A few are considered to be "farms" by the Hutterites, and will become colonies only when they formally split from the parent colonies that now manage them.
14. This estimate was provided by Manitoba Pork in Winnipeg. It includes several incorporated hog farms operated by feed mills owned by Mennonites.
15. Carlyle, "Mennonite Agriculture," 1981.
16. *Winnipeg Free Press,* 7 May 1990, 25; includes several incorporated hog farms see also W.G. Pond, "Modern Pork Production," *Scientific American* 248, 5(1983):96–103.
17. Estimates obtained from the Manitoba Chicken Broiler Producers' Marketing Board, Winnipeg.
18. Data obtained from the Manitoba Egg Producers' Marketing Board, Winnipeg.
19. R.L. Jones, *History of Agriculture in Ontario, 1613–1880* (Toronto: University of Toronto Press, 1946), 85–108.
20. Weir, *Atlas of Manitoba,* 90.
21. T.R. Weir, ed., *Economic Atlas of Manitoba* (Winnipeg: Department of Industry and Commerce, Province of Manitoba, 1960), 40.
22. T.R. Weir, "Pioneer Settlement of Southwest Manitoba, 1879 to 1901," *Canadian Geographer* 8, 2(1964):64–71; and W.J. Carlyle, "Farm Population in the Canadian Parkland," *Geographical Review* 79, 1(1989):24.
23. *Winnipeg Free Press,* 14 May 1990, 25.
24. Faculty of Agriculture, *Principles and Practices,* 96.
25. Ibid., 750.
26. C. Wilkins, "Amazing Flax," *Canadian Geographic* 108, 5(1988):38–41.
27. C.S. Pattle, "A Geographic Analysis of the Sunflower Industry in Manitoba" (M.A. thesis, University of Manitoba, 1972); D.E. Totten, "Agriculture of Manitoba Mennonites," *Mennonite Life* 4, 3(1949):24–7; and Carlyle, "Mennonite Agriculture."
28. J. Friesen, "The Manitoba Sugar Beet Industry — A Geographical Study" (M.A. thesis, University of Manitoba, 1962).
29. Carlyle, "Mennonite Agriculture."
30. Weir, *Atlas of Manitoba,* 97.
31. P.J. Peters, *A Century of Horticulture in Manitoba: 1880–1980* (Winnipeg: P.J. Peters, 1988), 252–8, 298.

Case Study 15.1
Hutterites in Manitoba
John Ryan

Hutterite farming communities are found throughout most of southern Manitoba (Figure 15.1.1). Their village-type settlements, known as colonies, consist of about 15 families or 100 people, with some being larger and some smaller. They are large-scale producers of crops and livestock.

Hutterite history dates back to 1528, when to escape persecution a group of about 200 Anabaptists established a communal society in Moravia (now in the Czech Republic). Under the initial leadership of Jacob Hutter, they established the basic tenets of Hutterian beliefs that are followed with little deviation to this day. Based on early Christian teachings, these beliefs include a form of communal living and communal ownership of property, nonviolence and opposition to war, and adult baptism. In addition, they have retained the dress, customs, language, and simple, austere lifestyle of their ancestors.

Because of persecution, they migrated from country to country, arriving in the United States in 1874.

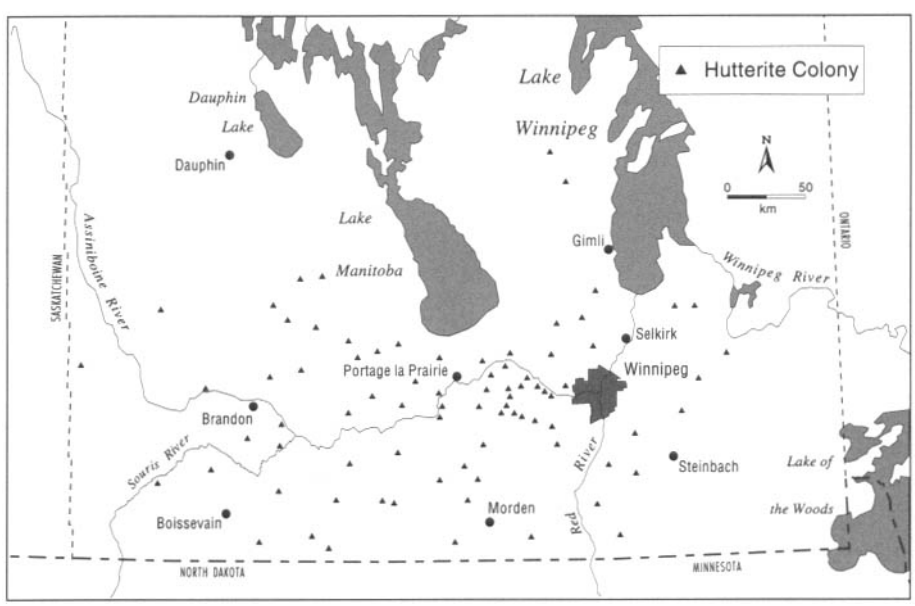

Figure 15.1.1 The Distribution of Manitoba's Hutterite Colonies in 1992

In 1917 the United States insisted that they serve in the military, and the Hutterites emigrated *en masse* to Canada the following year. Initially, they settled in Manitoba and Alberta. Colonies were later established in Saskatchewan, and, when the United States recognized conscientious objectors, some were reestablished south of the border. In 1992 the total Hutterite population was about 35,000; more than two-thirds are in Canada and the rest are in the United States.

All colony settlements follow a basic layout, with some variations depending on terrain and group choice. In many colonies the family homes encircle a central park, while the barns and other facilities form an outer circle or ring (Figure 15.1.2). The communal kitchen/dining hall is

centrally located; in most colonies church services are conducted in a part of this complex. Each colony has a kindergarten and a school.

Life in the colony is a mixture of 16th- and 20th-century influences. Although Hutterites live communally, each family has its own apartment or home, usually in a duplex or three-family dwelling. Hutterites speak three languages: English, German, and Tyrolean (a 16th-century German dialect). Children attend kindergarten from the age of 2 . Later, besides regular school, they have extra classes in German. Colony schools follow the standard curriculum and a number of colonies have their own college-trained teachers. In some colonies computers are now a regular classroom feature. In the past, most children stopped at grade 8, but there is now a push for further education in many colonies.

Each colony functions as an autonomous economic unit, but the Hutterian Church provides spiritual guidance and makes certain policy decisions for all members. Based on a 16th-century model, each colony is administered by a minister, a colony manager, and an executive council; all are elected except the minister, who takes office by a traditional election/selection process. Based on biblical interpretation, only baptized men have a formal vote in colony affairs, but women have a significant influence in an informal manner.[1]

At the end of 1992 there were 81 colonies in Manitoba, with a total population of 7,525. In 1991 Hutterites owned 144,920 ha, or 1.9 percent of Manitoba farmland. To put this in perspective, Hutterites constituted 9.5 percent of the Manitoba farm population, but on a per capita basis they owned only 20 percent of their proportionate share of farmland. Each colony had an average of 1,834 ha, and on the basis of 15 families per colony, each family had 122 ha. Since the average Manitoba farm in 1991 had 301 ha, this means that a Hutterite family had only 40.6 percent of the average.

Because of their well-managed, large-scale communal operations, relative to the amount of land they own the Hutterites produce significantly more than their proportionate share of agricultural produce. For example, in 1991 they had over 25 percent of the laying hens, over 25 percent of the turkeys, and 35 percent of the hogs in Manitoba. Besides conventional farm work, a number of colonies manufacture specialized farm equipment such as hog feeders, with a market in several provinces and the United States. Until fairly recently, the basic nature of the Hutterite settlements had been misunderstood, especially the relatively small amount of land that they own, and their productivity and contribution to the economy had not been appreciated.[2]

The survival of the Hutterites and their unique way of life is largely the result of their ability to retain their fundamental beliefs while adopting all the features of contemporary society essential for their economic and social well-being. Although some young people leave the colonies, most return; hence assimilation is not a serious problem for the Hutterites.

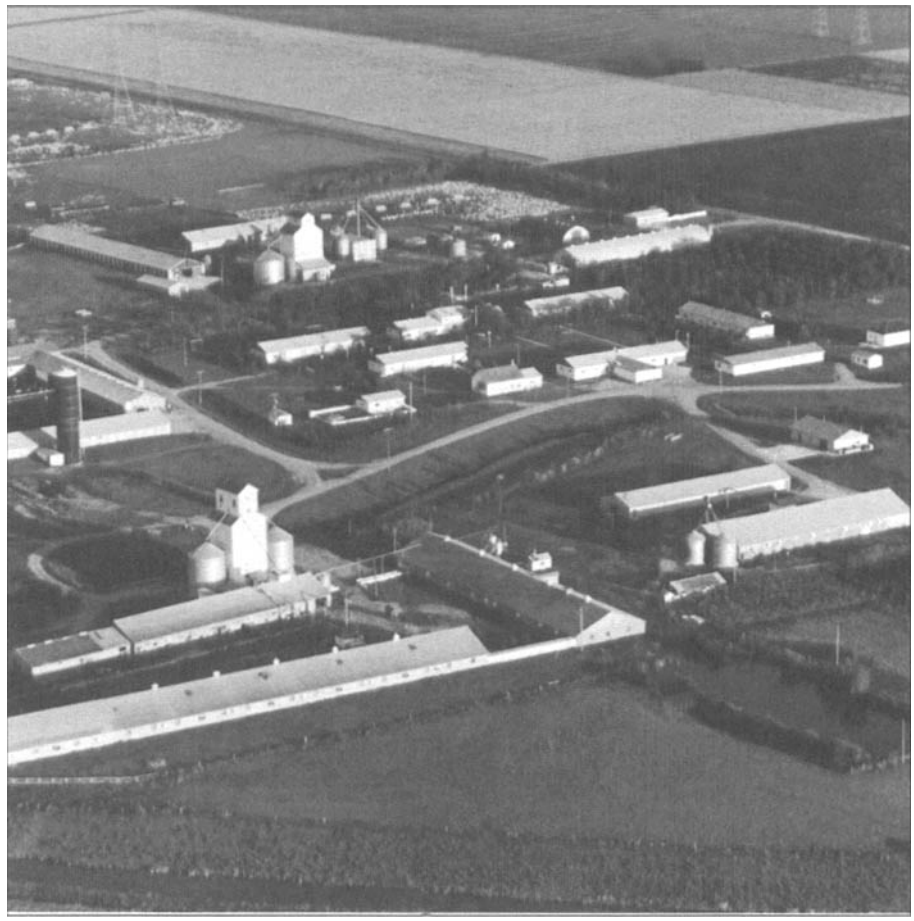

Figure 15.1.2 Sturgeon Creek Hutterite Colony. Founded in 1938; located 30 km west of Winnipeg. Typically, the residential core is surrounded by the buildings and facilities of various farm enterprises. (Photograph: Len Boszko)

NOTES

1. The description of the historical background and lifestyle of the Hutterites is from John Ryan, *The Agricultural Economy of Manitoba Hutterite Colonies* (Toronto: McClelland and Stewart, 1977).
2. The data in this section were compiled by the author from: (1) special compilation by Statistics Canada of Manitoba Hutterite data from the 1991 Agricultural Census of Canada at the request of the author; (2) Manitoba Hutterite Colonies Inventory for 1992, compiled by Meyers Norris Penny & Co., Brandon, at the request of the author; (3) Statistics Canada, *Agricultural Profile of Manitoba 1992,* Part 1, Catalogue No. 96-363 (Ottawa: Statistics Canada, 1992); and (4) Manitoba Agriculture, *Manitoba Agriculture Year Book 1991* (Winnipeg: Department of Agriculture, Province of Manitoba, 1991).

Case Study 15.2
The Manitoba Agricultural Hall of Fame
Fred McGuinness

When Almon James Cotton was elected to the Manitoba Agricultural Hall of Fame, the event brought to prominence the story of a man cut from the heroic mould.

He planted and harvested the first crop in the Swan River Valley. He was instrumental in the building of the first school in that area, and for many years served as trustee and secretary-treasurer of the new school district. He is credited with being the motivation behind the first church and the first cemetery. He wrote over 2,000 letters to prospective settlers, encouraging them to settle in that verdant valley. He was instrumental in having Canadian Northern lay the track for their Thunder Hill branch line. He was an early governor of the University of Manitoba. There is much more.

Cotton's elevation to the Hall of Fame placed both his name and his accomplishments on the public record. He was the 66th Manitoban to be awarded the highest honour that individuals associated with rural life in this province can receive.

It was representatives of a collection of farm associations who met in 1974 to establish a hall of fame. Their efforts were successful. Financing for the new agency came from a conditional grant of $5,000 from the Manitoba Department of Agriculture: to meet the condition, the sponsors had to collect at least that much again in matching grants from agribusiness. They far exceeded that goal.

The objective was to honour individuals who had made significant contributions to Manitoba agriculture or rural living. Individuals on their own or as a member of a group can submit names along with detailed information on the accomplishments of the nominee. The board of directors sits in judgement on each year's list, and those to be honoured are elevated to the charmed circle at an annual Dedication Day.

This custom of honouring farmers is almost as old as the printed word. Three hundred years before the birth of Christ, Pliny the Elder wrote that "the agricultural population produces the bravest men, the most valiant soldiers and a class of citizens the least given of all to evil designs." To establish agriculture in Manitoba certainly called for a lot of those "bravest men," nor can we forget the bravest women.

The first hogs to be introduced to this province arrived in Churchill in 1817, too late in the year to be transported via the river system to what is now Winnipeg. Their escort, William Laidlaw, was forced to wrap them in buffalo robes, lash them to sleighs, and haul them over the frozen lakes with teams of dogs. Sheep and cattle also had to be transported 700 miles (1,127 km) from shipboard by canoe and York boat.

Later generations of farmers may not have had to accept transportation systems quite that primitive, although they did have to contend with the vagaries of nature. Growing crops successfully in a territory that frequently knew frost and snow in August was not an undertaking for the weak of spirit. But "those bravest men" — and women — prevailed and established a thriving agricultural industry. At one time what they called the "Keystone Province" had 60,000 farm families.

In 21 years, 70 outstanding farmers, scientists, or farm homemakers have been inducted into the Manitoba Agricultural Hall of Fame. In a separate classification, known as the Roll of Honour, 22 more have been recognized for activities judged to be more local in nature.

Hall of Fame members have their portraits etched on copper plates and mounted on the wall of the dining room at the Agricultural Extension Centre at Brandon. Heading the list is the sole honour made to a collective, The Pioneer Women of Manitoba. The rest are individuals, except for one couple.

All of the Hall of Fame members are deceased, with the single exception of Grant MacEwan. This man has a record of accomplishment so extraordinary that it is not surprising he was included among the first year's inductees. He was born on a farm near Forrest and went on to become a farmer, professor, dean of agriculture, leader of various farm associations, and later the mayor of Calgary and the lieutenant-governor of Alberta.

The only couple to be honoured are Alfred and Edith Poole of Kemnay. Edith Poole was a founding member of the Kemnay Women's Institute, and a district president and provincial president of the Women's Institute; she went on to serve in a number of capacities in the world-wide association Countrywomen of the World. Alfred Poole was a breeder of Belgian horses, registered Hereford cattle, and registered Yorkshire swine. The quality of his stock won him many awards at Toronto's Royal Winter Fair.

The Hall of Fame is a silent but continuing reminder of the days when talented and spirited producers made farming the dominant element in the provincial economy. Many of them did more than just farm. John Bracken and Thomas Greenway served as premiers. T.A. Crerar was elevated to the Senate and for many years was a major spokesman on the national scene for Prairie agriculture. J.B. McGregor served a term as lieutenant-governor of Manitoba.

Also on the list are some agriculturalists whose research on specific plants is still significant years after their deaths. Dr. Harvey Tolton of Brandon was awarded an honorary doctorate from Brandon University for his success as an oat breeder. His entries in the Toronto Royal Winter Fair consistently kept him in the exalted position of "World Oat King." Dr. Frank Leith Skinner of Dropmore won an honorary doctorate from the University of Manitoba for his pioneer work in breeding hardihood into fruit trees. Henry L. Patmore of Brandon was a nurseryman whose production of green ash trees served to shade the boulevards of countless western Canadian towns and cities.

Included in the Hall of Fame is a reminder of one of Manitoba's more colourful pioneers. When he established his plural families near Treesbank, Percy Criddle was fresh from Heidelberg, where he had

studied law, music, medicine, and astronomy. He passed along his intellectual curiosity to his sons, two of whom became scientists of the first rank. One of them, Norman, was inducted because of his pioneer work in entomology as it applied to field crops.

The fact that males dominate the Hall of Fame in numbers does not mean that there are no female representatives. One of them is a household name. Nellie McClung was a teacher, later a farm homemaker, who became an author and political activist. She is acknowledged to have won the vote for Manitoba women. For decades her book *Sowing Seeds in Danny* was a source of inspiration to women on the agricultural frontier.

E. Cora Hind was first in many other respects, so it is appropriate that she was the first woman to be inducted into the Hall of Fame. She was the first female typist and stenographer on the Prairies. She was also the first female journalist, and the first journalist of either sex to write crop reports. She devised a system through which she contacted individual elevator operators for crop-yield data, making it possible for her to accurately forecast the size of each Prairie grain crop.

When the board of the Manitoba Agricultural Hall of Fame needed a large wall upon which to display the growing collection of coppertone portraits, they had them mounted in the Extension Centre's dining hall. Today these portraits are silent reminders of the brave men and women who developed Manitoba agriculture to its present level. They exemplify the Hall of Fame's credo: "From the past we draw wisdom; the present tests our strength; and our future is the bearer of all our hopes and dreams." Those whose portraits grace that wall are honoured for their wisdom, their strength, and their aspirations.

MINING AND EXTRACTIVE INDUSTRIES IN MANITOBA

16

Harvey R. Young

The earth's crust provides a wide range of metallic and nonmetallic minerals and fuels that have commercial value and that are essential to a modern technological society. Materials from the earth are used in the manufacture of a wide range of consumer goods; they provide energy for transportation and home heating; they are the basis of some agricultural fertilizers; and they are used as construction materials.

Canada is an important producer and exporter of mineral products. It is the world's largest producer of uranium and zinc concentrate; second in the production of nickel, gypsum, potash, and asbestos; and third in the production of aluminum, the platinum-group metals, sulphur, and molybdenum. Canadian production of cobalt, silver, copper, lead, cadmium, and gold also rank in the top five in the world.[1] In 1983–92 the annual value of mineral production in Canada exceeded $30 billion (Figure 16.1); in 1992 the figure was $35.4 billion.[2]

The value of production of metallic minerals, fuels, and industrial minerals (nonmetallic minerals and structural materials) varies greatly by province and territory (Figure 16.2). In 1992 Manitoba ranked sixth in Canada in total value of mineral resources produced (Table 16.1) — $1.136 billion for all metallic-mineral, industrial-mineral, and crude-oil production. Metals (mainly nickel, copper, and zinc) accounted for approximately 84 percent of this total, industrial minerals 8 percent, and petroleum products 8 percent. Mining is Manitoba's second-largest primary-resource industry, after agriculture. The decline in total value of mineral production since 1989 (Figure 16.3) reflects the difficult economic conditions that the extractive industries have been experiencing.

Manitoba's mineral and energy resources are an important component of the province's wealth. These industries provide not only direct employment for many but also indirect benefits related to the provision of goods and services for resource-development activities. Indeed, many communities — such as Flin Flon, Leaf Rapids, Lynn Lake, Snow Lake, and Thompson — owe their existence and livelihood directly or indirectly to mining.

This chapter focuses on the three main sections of the extractive industries in Manitoba: metallic minerals, industrial minerals, and petroleum. This grouping emphasizes the intended use of these commodities. Metallic minerals are a source of the metals employed in a wide range of applications. Industrial minerals are used in a variety of chemical and manufacturing industries and in the construction industry. Petroleum provides fuel for transportation and home heating, and is a source of lubricants.

MANITOBA: GEOLOGICAL SETTING

The geology of Manitoba is described in Chapter 2 and is illustrated in Figures 2.1 and 2.2 (on pages 13 and 14). Recall, however, that rocks of most geological ages from Precambrian to Tertiary (Table 2.1 on page 12) are present in the province. Precambrian rocks occur at the surface in the eastern and

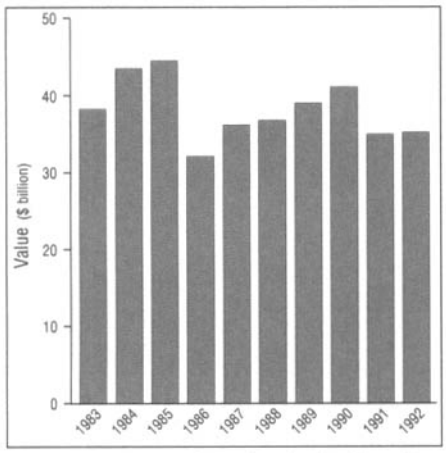

Figure 16.1 Mineral Production in Canada, 1983–92

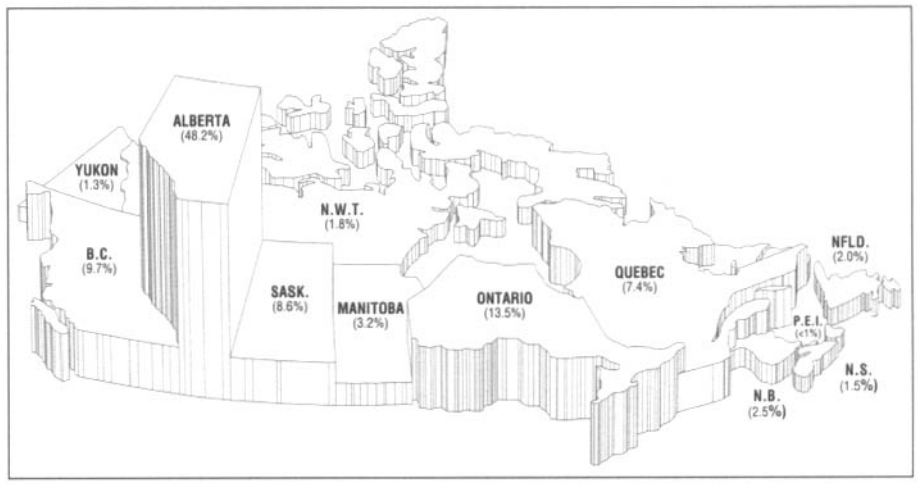

Figure 16.2 Value of Mineral Production (Metallic and Nonmetallic Minerals, Structural Materials, and Mineral Fuels) by Province / Territory in 1992

northern part of Manitoba (approximately 60 percent of the province), an area that is part of the Canadian Shield.

The Canadian Shield in Manitoba is divisible into two geological or structural provinces: the Superior Province, which contains rocks older than 2.5 billion years, and the Churchill Province, composed of younger (1.8–2.0 billion years) Precambrian rocks. The Precambrian surface is inclined towards the southwest, where it is buried beneath younger Paleozoic and Mesozoic deposits (Figure 2.2 on page 14), reaching a depth of more than 2,300 m below the surface in the extreme southwestern part of the province.

Paleozoic strata underlie both the Hudson Bay Lowlands and the Manitoba Lowlands. Bedrock is composed primarily of limestone, dolomitic limestone, and dolostone, a sedimentary rock composed of the mineral dolomite, $CaMg(CO_3)_2$. Mesozoic rocks, which total nearly 1,100 m in thickness, are confined to the southwestern part of the province and are composed mainly of sandstone and shale. Tertiary deposits are known only in the Turtle Mountain area in the south.

METALLIC-MINERAL DEPOSITS IN MANITOBA

In 1992 the value of metallic-mineral production in Canada was approximately $10.2 billion;[3] Manitoba ranked fourth among the provinces/territories with 9.4 percent of the total (Table 16.1, Figure 16.4). During 1992 Manitoba mines produced 34 percent of Canada's nickel, 20 percent of its cobalt, 8 percent of its copper, 7 percent of its zinc, and 1.6 percent of its gold. The entire Canadian output of tantalum was mined in southeastern Manitoba.[4]

Table 16.1 Canadian Mineral Production (in Thousands of Dollars) by Province or Territory, 1992

Province/Territory	Metals	Fuels	Industrial Minerals	Total for Province/ Territory	% of Total
Newfoundland	697,565	-	37,737	735,302	2.00
Prince Edward Island	-	-	3,414	3,414	0.01
Nova Scotia	402	367,330	172,181	539,913	1.50
New Brunswick	568,207	32,000	285,616	885,823	2.50
Quebec	1,629,749	-	1,000,692	2,630,441	7.40
Ontario	3,562,432	74,528	1,143,492	4,780,453	13.50
Manitoba	956,456	87,078	92,495	1,136,029	3.20
Saskatchewan	407,985	1,795,431	849,239	3,052,655	8.60
Alberta	464	16,691,427	386,756	17,078,647	48.20
British Columbia	1,447,125	1,600,734	399,827	3,447,686	9.70
Yukon Territory	462,648	-	5,223	467,871	1.30
Northwest Territories	476,160	170,397	6,750	653,315	1.80
Total	10,209,192	20,818,925	4,383,431	35,411,548	100

Source: *The Northern Miner Magazine*, March 1993.

The value of these metals — primarily nickel, copper, and zinc — exceeded $945 million in 1992. Other metals — such as gold, the platinum-group elements, cobalt, silver, lead, and so on — were recovered as by-products of smelting operations and account for approximately 10 percent of the total value of metal production in the province (Figure 16.5).

Significant expenditures are made each year in searching for new mineral deposits. Mineral exploration may involve the use of airborne geophysical surveys to locate prospective targets. Follow-up ground work may require additional geophysical surveys, detailed mapping and sampling, or diamond drilling. Although exploration expenditures have fallen since the all-time high of approximately $50 million in 1987 (Figure 16.6), they still exceeded $35 million in 1991.[5]

Although traces of metallic minerals are widespread in the rocks of the Canadian Shield in Manitoba, workable concentrations are quite rare. The term "ore" is used to describe naturally occurring deposits from which a mineral, or minerals,

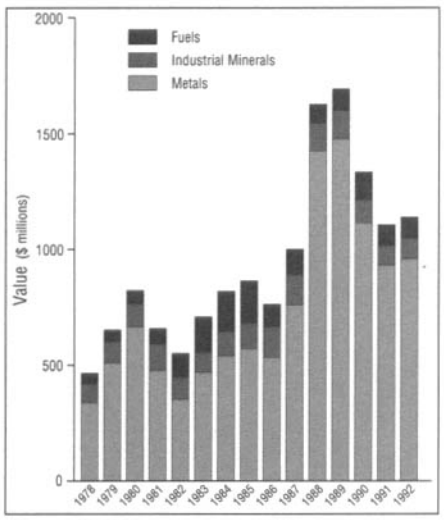

Figure 16.3 Components of Mineral Production in Manitoba, 1978–92

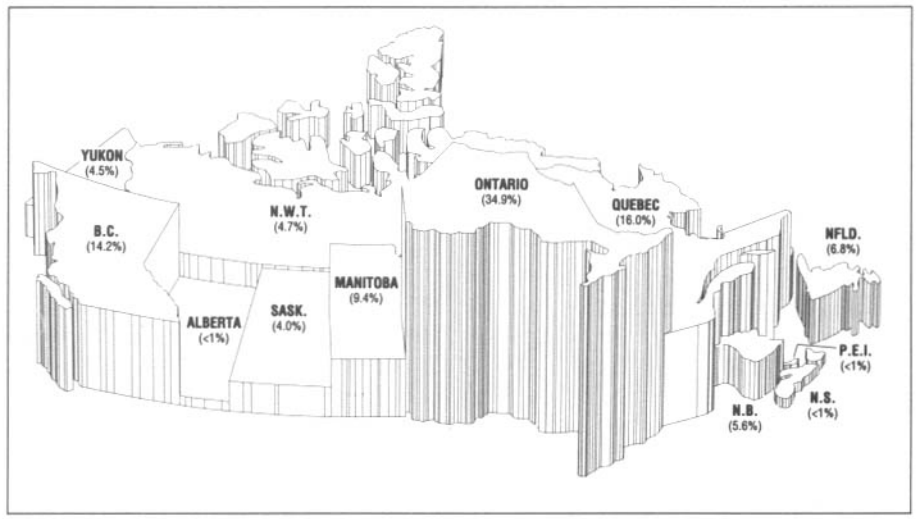

Figure 16.4 Value of Metallic-mineral Production by Province / Territory, 1992

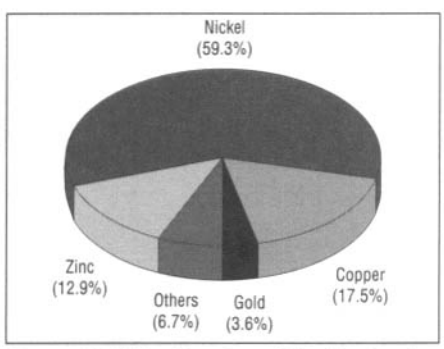

Figure 16.5 Metallic-mineral Production in Manitoba, 1992

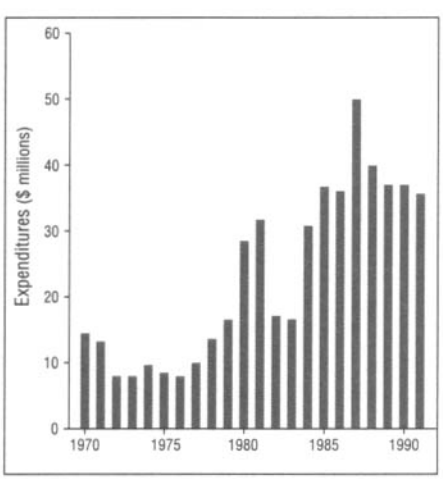

Figure 16.6 Expenditures for Mineral Exploration in Manitoba, 1970–91

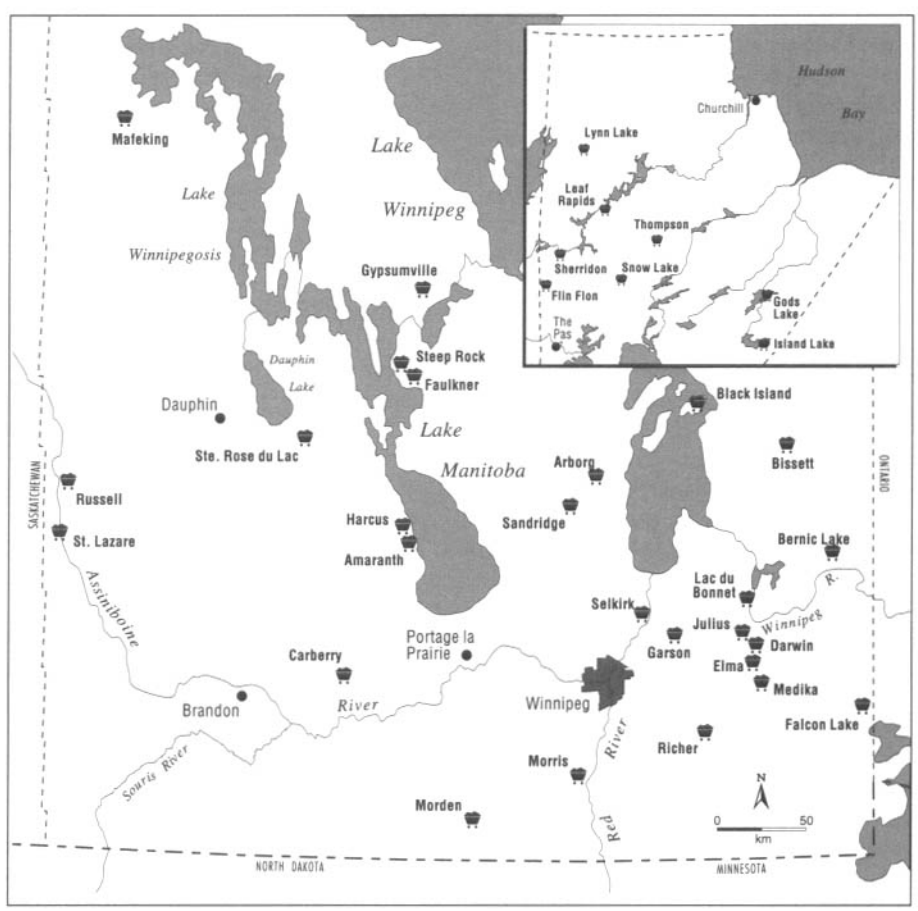

Figure 16.7 Location of Mineral Deposits in Manitoba

of economic value can be extracted at a profit. The concentration of a particular mineral that is required to qualify a deposit as an orebody varies from metal to metal and depends on technology and economies of scale. Ore grade may be expressed as a percentage of the metal present or, in the case of gold and silver, in ounces per ton or grams per tonne.

The term "precious metal" is used to describe metals such as gold, silver, and those of the platinum group. "Base metal" generally refers to metals such as copper, lead, and zinc that are neither precious (hence of lower value) nor alloyed with iron.

Metallic-mineral deposits of economic value occur in Precambrian rocks in four main areas in the province: (1) the Thompson Nickel Belt of north-central Manitoba, (2) the Flin Flon–Snow Lake Belt, (3) the Lynn Lake–Leaf Rapids area, and (4) eastern and southeastern Manitoba (Figure 16.7).

Thompson Nickel Belt

The northeast-trending Thompson Nickel Belt, which contains some of the most important nickel deposits in the world, is situated in a narrow (10–35 km wide) belt along a 125 km segment of the boundary zone between the Churchill and Superior Provinces of the Canadian Shield. Currently nickel ore is mined from open-pit (surface) and underground mines at Thompson and at the Birchtree Mine, 5 km southwest of Thompson. During the 1970s ore was also produced at several other mines (Pipe Mine, North and South Soab Mines, and Manibridge Mine) located along the nickel belt southwest of Thompson.

High-grade nickel ore was initially discovered in the area in 1956 by the International Nickel Company of Canada Ltd. (Inco), in the vicinity of what is now the city of Thompson. Shaft sinking and construction of surface facilities began in 1957, and initial production commenced in 1960. Inco's Thompson operation is fully integrated, with all stages of nickel production, from mining of the ore to refining of the nickel, carried out at one location.

The Thompson ore contains the minerals pentlandite (a nickel-iron sulphide), pyrrhotite (an iron sulphide), and chalcopyrite (a copper-iron sulphide). Electrolytically refined nickel, containing 99.9 percent nickel, is the main product at Inco's Thompson complex. Nickel is the most important primary metal produced in Manitoba, and in 1992 more than 64 million kg of the metal, valued at more than $566 million, were produced. This represents approximately 34 percent of Canadian production, with Ontario producing the rest.

Besides nickel, the Thompson complex also produces high copper-nickel matte,[6] cobalt oxide (which is shipped to the United Kingdom for further refining),[7] pentlandite concentrate, and small amounts of the platinum-group metals.

The economic impact of nickel production on the Manitoba economy is substantial. Over 1988–92 the average value of nickel production in Manitoba was more than $780 million. Commenting on Inco's announcement that it would proceed with further development at the Thompson and Birchtree orebodies, *The Northern Miner* (5 November 1990) stated: "This investment will also bring to more than $1.0 billion the amount that Inco has invested in the Thompson facilities over the 30 years since the discovery of the orebodies."

Flin Flon–Snow Lake Belt

Base-metal production in Manitoba is associated with linear areas of the Canadian Shield referred to as greenstone belts. These are areas of largely volcanic rocks that have been subjected to deforming forces and elevated temperature (metamorphism) within the earth's crust. Rocks of greenstone belts are typically fine-grained and greenish in colour because of the abundance of the minerals chlorite, epidote, and amphibole, formed during low-temperature (400–500°C) metamorphism.

The Flin Flon–Snow Lake greenstone belt, up to 50 km wide, extends from east of Snow Lake into Saskatchewan west of Flin Flon (Figure 16.7). To the south it is concealed by rocks of Ordovician and Silurian age. Total mineral production in the Flin Flon–Snow Lake area, one of the most productive Precambrian mineral districts in Canada,[8] exceeds that of any other greenstone belt in Manitoba.

Although several gold deposits have been mined in the region, the Flin Flon–Snow Lake belt is best known for its volcanogenic massive sulphide (VMS) deposits. In this type of deposit the minerals are inorganic compounds composed of sulphur and some other element(s) such as copper, zinc, iron, or lead. VMS deposits are believed to be chemical sediments that formed when hot-water vents on the seafloor discharged metal-rich brines, causing minerals to precipitate from solution. Such occurrences, termed "black smokers," have been observed along fracture zones on the floors of modern oceans.

The Flin Flon–Snow Lake area has been actively explored for gold and base-metal deposits since the early 1900s. Gold was discovered near Snow Lake in 1913, the Flin Flon sulphide orebody was staked in 1915, and the Mandy Mine, 5 km southeast of Flin Flon, began production as the first base-metal mine in the province in 1916. More than 20 base-metal deposits have been developed in the Flin Flon–Snow Lake area, primarily by the Hudson Bay Mining and Smelting Company Ltd. (HBMS) (Figure 16.8).

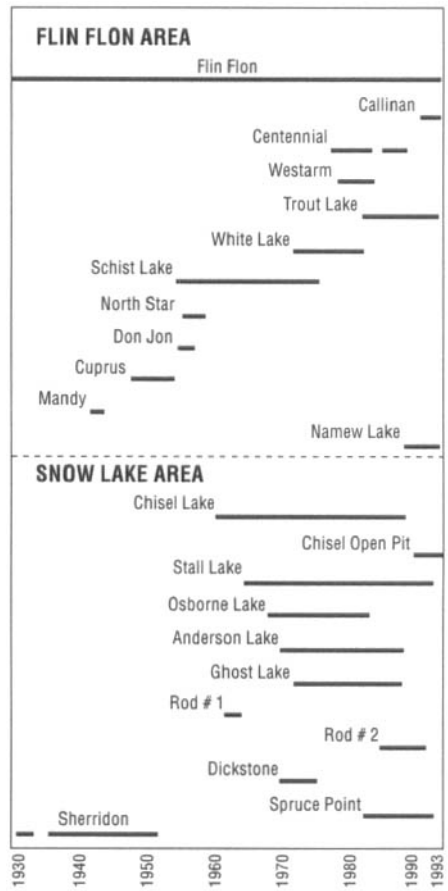

Figure 16.8 Duration of Mine Operations in the Flin Flon-Snow Lake Area, 1930–93

The Flin Flon deposit is the largest in the area, having produced more than 68 million tonnes of ore since 1930.[9] The ore, containing the minerals chalcopyrite ($CuFeS_2$) and sphalerite (ZnS), grades 2.2 percent copper, 4.1 percent zinc, and 2.6 grams of gold per tonne. Other mines in the area are considerably smaller than the Flin Flon mine, with average tonnages of 2.2 million and metal values ranging from 0.5 to 7.2 percent copper and 0.1 to 10 percent zinc.[10] The Namew Lake Mine, 70 km south of Flin Flon, produces nickel, which is shipped to Thompson and to Fort Saskatchewan, near Edmonton, for processing.

Figure 16.9(a) Hudson Bay Mining and Smelting Complex at Flin Flon; (b) Headframe, South Main Mine, Flin Flon. (Photographs: H. Young)

HBMS operates a metallurgical complex at Flin Flon (Figure 16.9). Copper and zinc are the main metals produced, and variable amounts of gold, silver, cadmium, lead, selenium, and tellurium are obtained as by-products. The principal products from HBMS facilities are anode copper, refined zinc, refined cadmium, and lead concentrate.[11]

Although at present the largest source of gold in the Flin Flon–Snow Lake Belt is the gold associated with VMS deposits (the Flin Flon deposit alone has produced more than 160,000 kg of gold),[12] several lode (vein)[13] gold mines have operated in the region in the past. The first gold discovery, made in 1914 in the Snow Lake region, led to production in 1917 from the area's first lode gold mine, the Ballast-Moosehorn Mine. Although a number of other mines, such as the Laguna and the Ferro, were developed in the Snow Lake area, only the Nor-Acme Mine was a major gold producer, producing more than 19,000 kg of gold and more than 1,500 kg of silver from 1949 to 1958.[14] Gold has also been produced in the Flin Flon district from the Gurney Mine (1937–39) and Tartan Lake Mine (1987–89).

Two formerly producing mines, one gold and one base metal, are located immediately north of the Flin Flon–Snow Lake greenstone belt. This area, referred to as the Kisseynew gneissic belt, is composed of complexly folded and metamorphosed sedimentary rocks.

In the Sherridon area, 65 km northeast of Flin Flon, Sherritt Gordon Mines Ltd. brought a VMS base-metal mine into production in 1931 — the Sherridon Mine, which operated from 1931 to 1932 and from 1937 to 1951. The ore, containing 2.4 percent copper and 2.0 percent zinc with associated gold and silver, was shipped to Flin Flon for processing. When the ore reserves were exhausted in 1951, much of the mining equipment and housing were moved north to the developing town of Lynn Lake.

A gold deposit, the Puffy Lake deposit, was discovered 12 km southeast of Sherridon in 1979 and produced ore from 1987 to 1989. Production plus reserves were estimated to be 603,000 tonnes of ore, with an average grade of 6.5 grams of gold per tonne.[15]

Lynn Lake–Leaf Rapids Area

Manitoba's first nickel-copper mine was discovered in 1950 by Sherritt Gordon Mines Ltd. at what is now Lynn Lake, 250 km north of Flin Flon. The A, EL, and Farley Mines were subsequently brought into production in the area. During 1953–76, more than 20 million tonnes of ore were mined, containing 167 million kg of nickel, 95 million kg of copper, as well as cobalt, gold, and silver.[16] The nickel concentrate was shipped to the Sherritt Gordon nickel refinery at Fort Saskatchewan for processing.

Later the former Fox Mine, located 45 km southwest of Lynn Lake, was discovered by Sherritt Gordon in 1961. This mine, which

was in production from 1970 to 1985, produced copper and zinc with gold and silver as by-products.[17]

The Ruttan Mine, located 20 km east of Leaf Rapids, was discovered by Sherritt Gordon in 1969 using airborne electromagnetic surveys. Production from this deposit, a copper-zinc massive sulphide deposit, began in 1973. Initially, from 1973 to 1979, open-pit methods were used to mine ore from what are known as the East and West Lenses; underground mining of the deposit came into full operation in 1979.

In 1987 HBMS purchased the Ruttan Mine and concentrator from Sherritt Gordon. Reserves at the Ruttan Mine have been estimated at 12.6 million tonnes, grading 1.46 percent copper and 1.68 percent zinc,[18] and its life will be extended by several years by the discovery of the "West Anomaly" deposit, 1 km west of the present mine, from which production began in 1991.[19] Ore is concentrated at the Ruttan Mine, and shipped by truck to Lynn Lake and then by railroad to Flin Flon. The concentrate, containing approximately 51 percent zinc and 27.5 percent copper, is treated at the HBMS metallurgical complex to produce anode copper and slab zinc.

With the closure of the Farley Mine at Lynn Lake in 1976, mining activity in the immediate vicinity of the community, which had grown to approximately 2,500, ceased. However, the area had been the site of gold exploration since the 1940s, and a number of gold occurrences had been located. In 1986 the MacLellan Mine (formerly called the Agassiz Mine), located 8 km northeast of Lynn Lake, was brought into production. From 1986 to 1989 it produced 3,530 kg of gold from 785,000 tonnes of ore, with an average grade of 5.89 grams of gold per tonne.[20] Currently a number of companies are exploring in the Lynn Lake area for base-metal deposits and gold.[21]

Eastern and Southeastern Manitoba

Although eastern and southeastern Manitoba are currently best known for their industrial-mineral production, greenstone belts within the Superior Province of the Canadian Shield have been the site of both base- and precious-metal production. In fact, the first recorded gold discovery in Manitoba was staked in 1890 in the vicinity of Falcon Lake in southeastern Manitoba. Four mines were subsequently developed in the area in the early part of this century, but the amount of gold produced was very small.[22]

Approximately 150 km north of Falcon Lake, in the Bissett region, gold mineralization is associated with rocks of the Rice Lake greenstone belt, where gold occurs in quartz veins and stringers that occupy fractures within the rocks. Most of the deposits were staked between 1911 and 1926.[23] Thirteen mines located in the region supplied more than 65 percent of Manitoba's primary gold to the end of 1986, and one mine, the San Antonio gold mine at Bissett, was the largest in the province in terms of gold production. It operated from 1932 to 1968 and again from 1982 to 1983, producing more than 42,000 kg of gold, more than half of the primary gold production in the province and more than 25 percent of *all* gold produced.[24]

Two other areas in central eastern Manitoba have also produced gold in the past. The Gods Lake Mine on Gods Lake (Figure 16.7), 560 km northeast of Winnipeg, operated from 1935 to 1943,[25] producing nearly 5,000 kg of gold valued at more than $5.9 million. The Island Lake Mine, 470 km northeast of Winnipeg on Mine Island in Island Lake, produced small quantities of gold during 1934–35.

Further south, the Bird River greenstone belt at Bernic Lake, 60 km northeast of Lac du Bonnet, hosts two former nickel-copper mines, the Dumbarton Mine and the Maskwa West Open Pit, which operated from 1969 to 1976, as well as the Tanco Mine. The latter, operated by Tantalum Mining Corporation of Canada (Tanco), is North America's only producer of tantalum. Here a multimineral pegmatite deposit hosts major quantities of tantalum, lithium, and cesium ores — materials that find application in specialized manufacturing, including the ceramics industry. The nickel-copper ore from the Dumbarton Mine and the Maskwa West Open Pit was shipped to Werner Lake in western Ontario for milling.[26]

Uses of Metals

Metals are an indispensable component of modern technology, and it is difficult to imagine modern life without them (Table 16.2).

Table 16.2 Uses of Metals Mined in Manitoba

Metal	Uses
Nickel	To produce stainless steel and coins
	For electroplating
Copper	In electrical equipment, plumbing, roofing, and cooking utensils
	For heat exchangers and auto radiators
	In coins, statues, and jewellery
Zinc	For zinc coatings, zinc alloys, and zinc castings
	In galvanized iron and steel
	In paint, ointments, and creams
Lead	In batteries and ammunition
	For use in the chemical and construction industries
Cobalt	To produce alloys
Cadmium	To produce nickel-cadmium batteries
Gold	In jewellery, electronics, dentistry, and coins
Silver	In jewellery, photographic materials, and electrical products
Tantalum	In computers, telecommunications equipment, metal-cutting tools
	For artificial joints and surgical pins
Lithium	For glass and cookware

INDUSTRIAL MINERALS

The term "industrial mineral" is used to describe a broad category of earth materials that are used in the construction, manufacturing, chemical, and agricultural industries. Industrial minerals include such commodities as aggregate for concrete and asphalt production, dimension

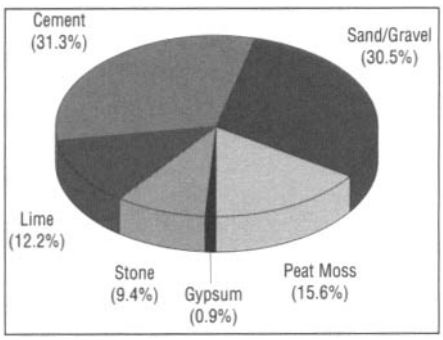

Figure 16.10 Industrial-mineral Production in Manitoba, 1992

stone, agricultural fertilizers, and material for the manufacture of wallboard, cement, glass, and paper.

The importance of industrial minerals to the Canadian economy is demonstrated by their daily use in virtually every economic activity in the country. They are essential, either directly or indirectly, to nearly all modern industries and to the standard of living enjoyed by Canadians. The value of industrial-mineral production in Manitoba in 1992 surpassed $90 million and represents approximately 8 percent of the total value of all metal, industrial-mineral, and petroleum production in the province.

Cement

In 1992 the value of cement production in Manitoba was more than $28 million, approximately 30 percent of the total value of all industrial-mineral production (Figure 16.10). The manufacture of Portland cement involves heating a specific mixture of high-purity limestone, clay, sand, and iron oxide to a high temperature (1,500°C) in a kiln. Gypsum, for quick setting, is added to the resulting "clinker," and the mixture is ground to a fine powder.[27]

Before 1989 two cement plants, Inland Cement Ltd. and Canada Cement Lafarge Ltd., operated near Winnipeg. Both plants used Devonian, high-purity limestone, quarried by Canada Cement Lafarge at Steep Rock, 240 km northwest of Winnipeg (Figure 16.7). Inland Cement also quarried high-calcium Devonian limestone north of Mafeking to supply its Portland cement plant in Regina.

When Inland Cement closed its primary cement operations in both Winnipeg and Regina in 1992, primary cement production in Manitoba ended, resulting in the closure of the Steep Rock and Mafeking quarries.[28] Inland Cement now trucks cement "clinker" from Alberta to Winnipeg. It is then ground locally and mixed with gypsum mined at Harcus, west of Lake Manitoba, for use in concrete.

Lime

Lime production, the value of which exceeded $11.2 million in 1992, is associated with the cement industry. High-calcium lime produced from high-calcium limestone is a major constituent of Portland cement, and if pure enough can be used in chemical applications. High-magnesia lime ("dolime") is produced from dolostone. Lime is used in the construction industry, in steel processing, in the pulp and paper industries, and in water and sewage treatment.[29] The replacement of some cellulose by lime in the pulp and paper industry may create an increased demand for this product.

High-calcium and high-magnesia lime are produced by Continental Lime Ltd. at their plant near Faulkner (Figure 16.7). Also high-calcium limestone deposits are, or have been, exploited along the eastern side of Lake Manitoba (Lily Bay, Spearhill, Steep Rock, Faulkner), and large new reserves have been identified in the Basket Lake region, north of Lake Manitoba.[30]

Aggregate Resources

The term "aggregate" is used to describe material such as sand, gravel, and crushed rock that is mixed with cement or bitumen to produce concrete and asphalt, or is used alone for road and railway construction, fill, and so on.[31] Aggregate resources are nonrenewable, and under current engineering technology have no suitable substitute for most end uses. They are characterized by low intrinsic value, high volume, and a price that is highly sensitive to transportation costs.[32]

The value of sand and gravel production in Manitoba in 1992 was $28.2 million, making it one of the most important industrial-mineral categories (Figure 16.10). Approximately half the sand and gravel used in the province is for road construction or maintenance.[33] Other uses include production of concrete and asphalt, as fill for sewer and water-line excavations, and as backfill for mined-out space. Large-scale engineering projects such as the construction of flood-control dams or hydro-electric projects also use large quantities of sand and gravel.

The extensive natural deposits of sand and gravel throughout Manitoba are generally related to processes associated with the deglaciation of Manitoba at the end of the last Ice Age (Chapter 2). During deglaciation, sand and gravel accumulated in moraines, eskers, delta complexes, and beach deposits, and along meltwater channels.

For example, the Birds Hill esker-delta complex northeast of Winnipeg is the main source of sand and gravel for the city. The sand hills of the Carberry area represent part of a large delta of the ancestral Assiniboine River that formed in an embayment along the western margin of glacial Lake Agassiz. Coarse gravels deposited at the apex of the delta, just east of Brandon, are a local source of high-quality aggregate, as are the Agassiz beach ridges, such as the Arden Ridge near Neepawa (Chapter 2).

Although many northern centres of population have adequate supplies of sand and gravel, others have deposits of only limited thickness and extent, or supplies have already been depleted. Similarly, in some parts of the Interlake region, the thinness of the overburden lying on bedrock limits the availability of sand and gravel. In such areas, quarrying and crushing the local bedrock provides an alternative supply of necessary material. A variety of igneous and metamorphic rocks, limestone, dolostone, and shale may be employed.

Although most crushed rock is suitable for road construction, not all types can be used for concrete aggregate, asphalt aggregate, or railway ballast. Much of the aggregate used in Winnipeg and surrounding areas has been supplied from the Interlake region and localities immediately northwest and northeast of the city.

In areas adjacent to urban centres, land-use conflicts and environmental problems may lead to high-quality sand and gravel deposits being taken out of production (sterilization). This will lead to higher local construction costs because of increased hauling distances required when exploiting new deposits,[34] thereby demonstrating the need to identify and protect conventional aggregate resources.

Peat Moss

Peat moss is currently harvested from several bogs in southeastern Manitoba. The peat, composed of the remains of a variety of plants, ideally sphagnum moss, is employed primarily in horticulture as a soil conditioner. As a soil additive, peat helps soils retain moisture (sphagnum moss will absorb 18– 26 times its own dry weight),[35] and helps break up heavy clayey soils.

Peat has also been used as poultry and stable litter; as packing material for perishable items such as fruit, vegetables, and cut flowers; and, most recently in Quebec, in the production of sanitary napkins. Peat is also being tested as a filtering agent for the treatment of certain liquid wastes.[36] The value of peat moss production in Manitoba in 1992 was $14.4 million.

Production of peat moss in Manitoba began in 1941 from the Julius Bog, approximately 30 km southeast of Beausejour. Currently Fison Horticulture Inc. operates four bogs in the Julius-Elma area, approximately 70 km east of Winnipeg. Premier West Peat Moss produces peat from the Giroux Bog, south of the Trans-Canada Highway near Richer, and from the southeastern bog of the Caribou cluster of bogs, approximately 35 km south of Falcon Lake. Both companies produce specialty value-added products by adding fertilizer or other materials to the peat, making it ready to use for horticultural purposes.

Large reserves of high-quality horticultural sphagnum peat have been identified along the western side of Lake Winnipeg,[37] but they have not yet been exploited.

Building Stone

Building stone, or dimension stone, is naturally occurring rock that is quarried and then shaped to specific dimensions. The material produced may be used for facing stones in construction; in monuments, curbs, and paving blocks; or as tiles for decorating walls and floors. Currently there are four major dimension stone quarries and several test quarries operating in southern Manitoba. In the past, several small quarries operated in southeastern Manitoba, and in the 1930s an ornamental dolostone, known locally as "marble," was quarried along the Hudson Bay Railway northeast of The Pas. In 1992 more than 1,700 tonnes of building stone, valued at $8.7 million, was quarried in Manitoba.

The distinctive mottled pattern of the fossil-bearing Tyndall stone, an Ordovician dolomitic limestone, makes it Manitoba's best-known

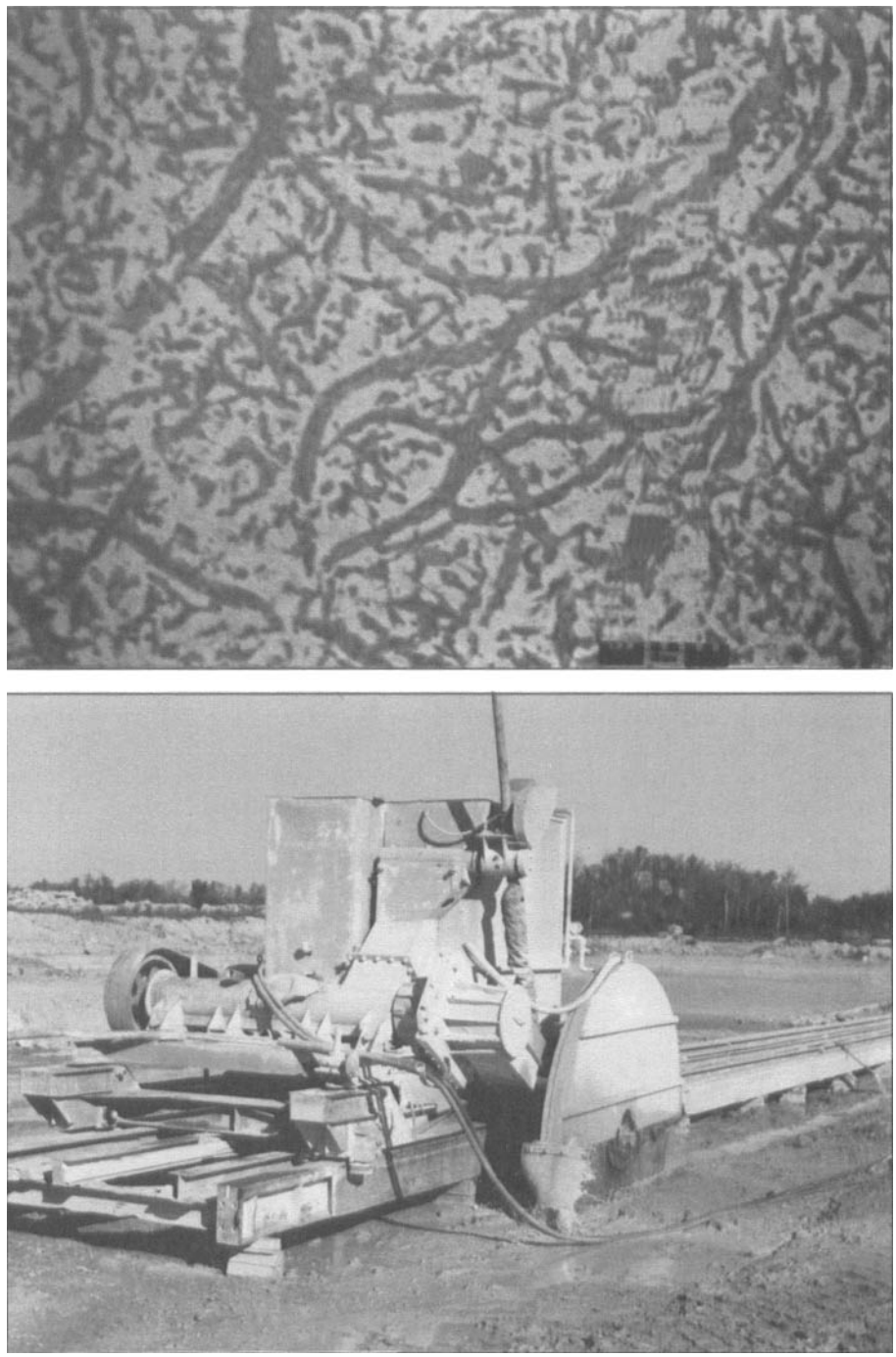

Figure 16.11(a) The Distinctive Mottled Pattern of Tyndall Stone; (b) A Saw Cutting Tyndall Stone, Gillis Quarries Ltd., Garson, Manitoba (Photographs: H. Young)

building stone (Figure 16.11). It was first quarried along the Red River in 1832 to build Lower Fort Garry, and production began in the Garson area in the latter part of the 19th century, perhaps as early as 1894.[38] The name "Tyndall stone" is derived from the name of the railway shipping point, approximately 3 km east of Garson, from which the quarried material was originally shipped.

Today Gillis Quarries Ltd. operates a quarry and finishing plant at Garson, 25 km northeast of Winnipeg, where Tyndall stone is prepared for market. It has been widely used in commercial and public buildings across Canada, notably the Parliament Buildings in Ottawa, the Museum of Civilization in Hull, Quebec, and the Legislative Buildings, Art Gallery, City Hall, and Convention Centre in Winnipeg.

Precambrian granite is quarried at Lac du Bonnet, Darwin, and Medika in southeastern Manitoba. Cold Spring Granite (Canada) Ltd. quarries a pink-red granite 10 km southwest of Lac du Bonnet. Although some finishing is done at the quarry site, most is done at the Minnesota plant of the parent company. Shield Quarries of Canada Ltd. operates a granite quarry at Darwin, 13 km northeast of Whitemouth. Rough stone is sold directly from the quarry or sent to Quebec for finishing. Canital Granite Ltd. quarries granite near Meditation Lake in Whiteshell Provincial Park and near Medika, approximately 80 km east of Winnipeg. It also operates a finishing plant in Winnipeg where polished granite tiles, slabs, and blocks are produced.[39]

Whiteshell Quarries Ltd. has intermittently quarried a product called "flagrock" from a site in the Bird River region northeast of Lac du Bonnet, near the Manitoba-Ontario border. The rock has a distinctive reflective finish because of an abundance of mica flakes on the fracture surface. It has been employed as a facing stone for homes, office and commercial buildings, and fireplaces, and as flagstone in walkways and patios.

Trade in dimension stone is normally undertaken at the local or national level because of the high transportation costs. Manitoba granite has been used in a number of commercial and public buildings in Canada, the United States, and even Japan. Canadian sales of rough and finished granite to Japan rose sharply in 1992.[40]

Gypsum

Gypsum is a common and important building material, used mainly for the production of wallboard or gyproc. It is also used as an additive in Portland cement, as a filler in paint, and as a soil additive to neutralize saline conditions. When heated or calcined, gypsum yields plaster of Paris.

Historically, three areas — Gypsumville, Amaranth, and Silver Plains — have supplied Manitoba with gypsum. A number of quarries operated in the Gypsumville area from 1901 to 1984.[41] Manitoba's first underground mine was opened just south of Amaranth in 1929 and produced until 1963; a second one operated from 1967 to 1970. In 1964 Westroc Industries Ltd. brought an underground gypsum mine into production at Silver Plains, near Morris. Mining continued until 1975, when artesian water broke through the floor of the mine, flooding it and causing the mine to be abandoned.

Current gypsum production in Manitoba, valued at $883,000 in 1992, comes from two quarries at Harcus, 16 km north of Amaranth. The quarries, operated by Westroc Industries Ltd. and by Domtar Construction Ltd., supply wallboard plants in Winnipeg and Saskatoon. Some of the gypsum is also used as an additive in the manufacture of Portland cement.

PETROLEUM RESOURCES IN MANITOBA

Geological Setting

Geologically, southwestern Manitoba is situated on the northeastern flank of the Williston Basin, a major geological basin that underlies southwestern Manitoba, southern Saskatchewan, North and South Dakota, and eastern Montana. In Manitoba, Paleozoic, Mesozoic, and Cenozoic rocks are inclined towards the southwest, towards the centre of the basin located in western North Dakota (Figure 2.2 on page 14). The sedimentary section also thickens in a basinward direction, and in the extreme southwestern corner of Manitoba up to 2,300 m of sedimentary rocks overlie Precambrian "basement."[42] Paleozoic rocks in southwestern Manitoba occur only in the subsurface, and consist predominantly of limestone and dolostone. In contrast, Mesozoic and Cenozoic rocks are primarily shale with minor associated sandstone.

Oil production in Manitoba is obtained from the Mississippian Bakken, Lodgepole, and Mission Canyon formations and the Jurassic Amaranth formation (Table 2.1 on page 12). The depth to producing formations varies from as little as 600 m in the Virden area to more than 1,000 m at Waskada and Pierson. Because of the cost of drilling, depth to the producing horizon is a major factor in determining the cost of bringing a well into production. Costs typically range from $200,000 to $320,000 per well.[43]

Oil in reservoir horizons in Manitoba oil fields occurs in small openings between rock particles. The volume of pore space ranges from 9 to 14 percent for limestone and dolostone reservoirs, and from 13 to 17 percent for sandstone reservoirs.[44] The oil produced in Manitoba originated far from its present location. It formed in the deeper parts of the Williston Basin, where sedimentary rocks rich in organic material, called source rocks, were heated sufficiently to cause the organic material to be transformed into oil. The oil then migrated along zones of interconnected pore space, for distances of 150–250 km, until further movement was prevented and it accumulated to produce the oilfields of southwestern Manitoba.

History of Exploration

The search for oil and gas in Manitoba began in 1877, when the Manitoba Oil Company drilled a well 20 km southwest of Dauphin. During the late 1800s and early 1900s, a number of shallow (400 m) wells were drilled in the search for petroleum; while most were unsuccessful, they provided useful information

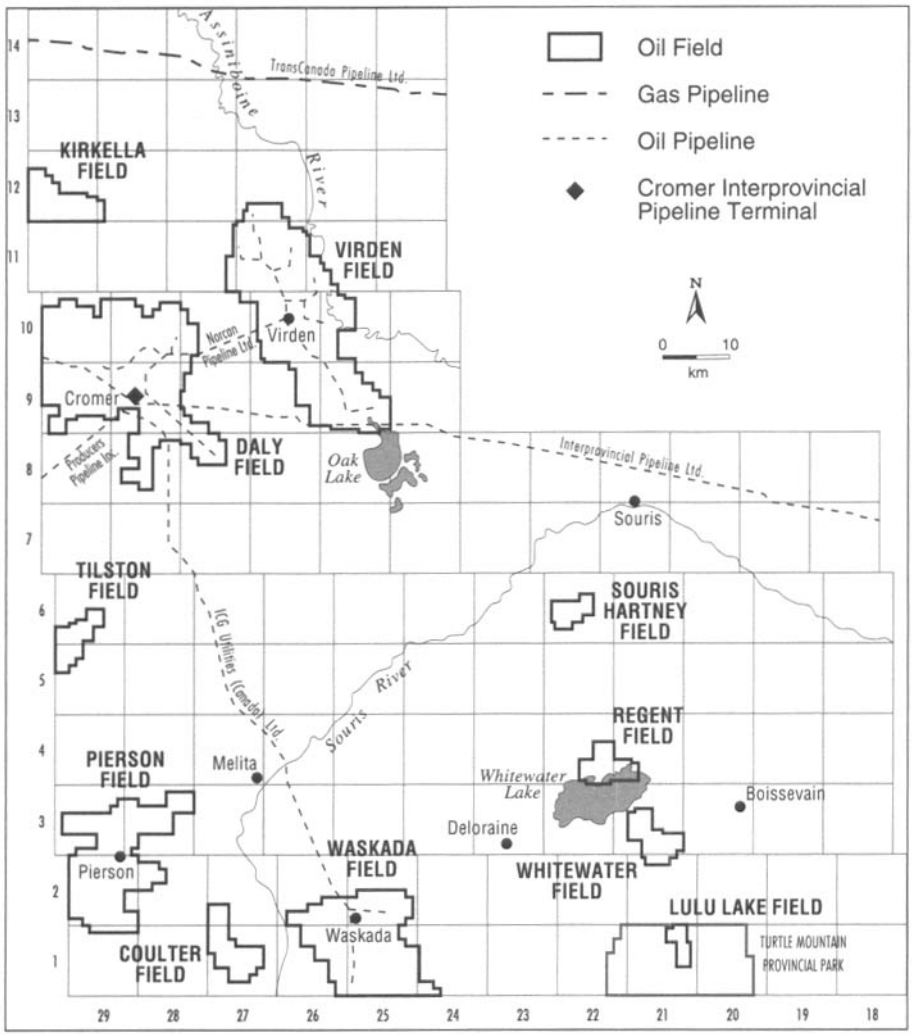

Figure 16.12 Oil Fields of Southwestern Manitoba

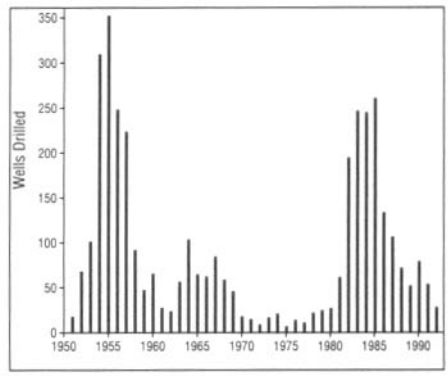

Figure 16.13 Oil Wells Drilled in Manitoba, 1950–92

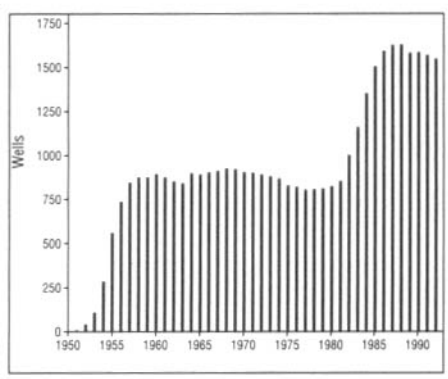

Figure 16.14 Wells Capable of Producing Oil in Manitoba, 1950–92

on the subsurface geology of southwestern Manitoba. Shows of natural gas were reported during the drilling of some wells, and in the Melita-Waskada area several wells provided enough gas for local cooking and lighting.[45] Between 1930 and 1950 the search for oil accumulations continued, and by the late 1940s wells deeper than 1500 m were being drilled across southwestern Manitoba.

In November 1950 the California Standard Oil Company (now Chevron Canada Resources) drilled a well in the Daly area, 15 km west of Virden. After a period of testing, the well began producing oil in February 1951. This discovery marked the beginning of commercial oil production in Manitoba; as additional wells were drilled, the existence of a significant oil accumulation in what is now known as the Daly field was confirmed. The Daly discovery was also significant in that it was the first discovery in the Williston Basin, later to become one of the major oil-producing areas in North America.

Increased exploration drilling during the oil boom of the 1950s resulted in the discovery of several new fields: Tilston and Waskada in 1952; Virden, Lulu Lake, and Whitewater in 1953; Pierson in 1954; West Butler (now part of the Daly field) in 1955; and Kirkella in 1957[46] (Figure 16.12). All oil produced in these fields was obtained from Mississippian rocks.

The initiation of a second oil boom in Manitoba occurred in 1980, when Omega Hydrocarbons obtained commercial oil production from sandstones of the Jurassic Amaranth formation (Table 2.1 on page 12) in the Waskada field.[47] This was the first non-Mississippian production in Manitoba and sparked a period of active development drilling in which more than 300 wells were drilled in the Waskada field (Figure 16.13). Subsequently, oil production from the Amaranth formation was obtained at both Pierson and Coulter. It was not until 1985 that oil was discovered in the Daly area in the Mississippian Bakken formation, the oldest oil-producing formation in the province.

Petroleum Production

Approximately 3,800 wells have been drilled in Manitoba in the search for oil and in the development of discovered oil pools. Currently there are 11 designated oil fields in the province. A few single-well oil pools occur outside field limits.

In December 1992, of 1,547 wells capable of production, 1,387 wells were actually producing oil in Manitoba (Figure 16.14). Wells in

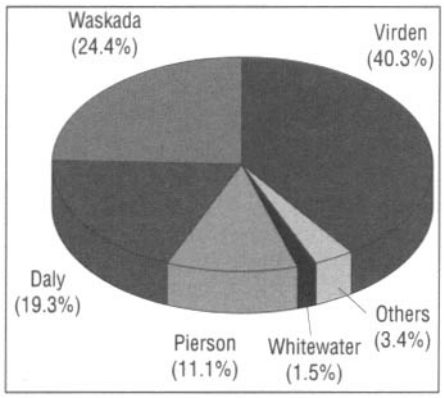

Figure 16.15 Oil Production from Manitoba Oil Fields, 1992

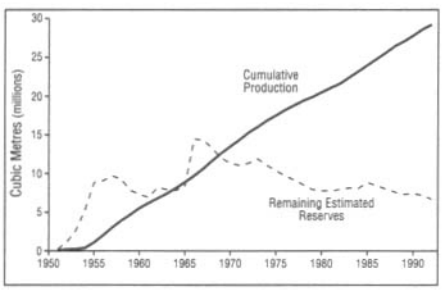

Figure 16.16 Oil Production and Estimated Reserves in Manitoba, 1950–92

the Virden, Waskada, and Daly fields accounted for 40 percent, 24 percent, and 19 percent, respectively, of Manitoba's total production (Figure 16.15), which in 1992 was 656,415 m^3 or 4.1 million barrels.[48]

Average daily oil production in 1992 was 1794 m^3 per day. Since production began at Daly in 1951, more than 29.2 million m^3 (184 million barrels) of oil have been produced in Manitoba. Remaining established oil reserves as of 31 December 1992 are estimated to be 6.695 million m^3 (45.5 million barrels), giving a life index of 10.2 years.[49]

Additions to established oil reserves are directly related to drilling activity (Figure 16.13). During the early 1970s new discoveries did not keep pace with production, so remaining established reserves declined (Figure 16.16). During the 1980s discoveries in the Waskada and Daly fields resulted in increases in remaining established reserves, but after 1990 reserves gradually declined to current levels.

Since the Shell Refinery in St. Boniface closed in 1983, oil has no longer been refined in Manitoba. Instead, it is transported by pipeline or truck from wells in Manitoba to the Interprovincial Pipeline pumping station at Cromer, southwest of Virden (Figure 16.12), where it enters the pipeline for delivery to refineries in eastern Canada or the United States. Manitoba's crude-oil production is equivalent to 25–30 percent of its requirements for refined petroleum products.[50]

There is no production of non-associated natural gas (gas that exists in the absence of oil) in Manitoba. Gases that do occur are dissolved in the oil. Normally the amount is small and comes out of solution as the oil is pumped to the surface. It is then collected and disposed of by burning.

In the Waskada field, however, a gas-processing plant, the only one in Manitoba, recovers propane, butane, and condensate from the solution gas. The dry gas is then reinjected into the producing horizon for possible future use.[51] In 1992 the value of propane, butane, and condensate processed at the Waskada plant was approximately $385,000.[52]

Enhanced Oil Recovery

Several natural mechanisms cause oil to flow into a borehole and upward towards the surface. Two of these, water drive and solution-gas drive, operate in Manitoba oil fields. However, they may be insufficient to force the oil to the surface, so pumps are installed (Figure 16.17).

Oil obtained by water drive or solution-gas drive is referred to as "primary recovery." A number of factors influence the effectiveness of these processes, but typical primary recoveries in Manitoba are only 7–15 percent of the original oil in place.[53] Consequently, oil companies have devised several schemes to increase the productivity of oil wells. One of these, waterflooding, was first used in Canada in the Daly field in 1953, and is now widely used in Manitoba.

Waterflooding involves the injection of water under pressure into the oil-bearing horizon at selected locations. This forces the oil into nearby producing wells, where it is pumped to the surface. Current waterflood recoveries for the Daly and Virden areas are approximately 20 percent and 27 percent, respectively, and ultimate waterflood recovery estimates range from 30 to 35 percent of the original oil in place.[54]

Large quantities of salt water are mixed with the oil in the reservoir horizons of Manitoba oilfields. When this mixture is brought to the surface, the two are separated. The salt water is disposed of by pumping it down saltwater disposal wells or using it in waterflood projects. In 1992 more than 6.7 million m^3 of salt water were produced, approximately 10 times the volume of oil production.

Economic Benefits of the Petroleum Industry in Manitoba

The petroleum industry has a significant impact on Manitoba's economy. The value of Manitoba crude oil sold in 1992 exceeded $86 million, based on an average selling price of $136.46 per m^3 ($20.89 per barrel).[55] That year, the Manitoba government collected approximately $7.1 million in revenues ($2.0 million in Crown oil royalties, $4.9 million in freehold oil taxes, and $0.2 million in Crown lease sale bonuses, rentals, and fees). Industry expenditures, which reached $58 million for 1992, include the cost of geological and geophysical work, land acquisition, drilling of exploration and development wells, maintenance of production facilities and pipelines, payment of royalties to individuals, and Crown and municipal taxes.

In Manitoba approximately 80 percent of the oil rights are privately owned (freehold); the other 20 percent are owned by the Crown. It is estimated that in 1992, $9.4 million in gross royalties were paid by oil companies to freehold mineral owners.[56] Owners of the surface rights of an oil-well lease are also compensated by oil companies when a well is drilled on their property. Normally landowners are paid a first-year bonus for new leases and an annual rental fee. In 1992 owners of surface rights received approximately $3.0 million, of which $2.8 million was for annual rental fees.

POTENTIAL FUTURE RESOURCE DEVELOPMENT IN MANITOBA

The economic viability of natural-resource extraction depends on many factors, including current economic climate, available technology, demand for the product, competition, and so on. Some commodities once produced in Manitoba are no longer exploited. These, along with several others that have never been mined, are being investigated to determine whether it is feasible to extract them here. Besides the commodities described below, the latter category includes talc, garnet abrasives, phosphate, building stone, titanium, and vanadium.

Potash

The term "potash" is used to describe naturally occurring potassium-bearing salts such as sylvite, carnallite, and polyhalite, and products derived from them. Potash deposits occur in the subsurface in extreme western Manitoba in a narrow belt extending southward from Russell to the North Dakota border. Deposits in the St. Lazare–Russell area are correlated with those mined at Rocanville and Esterhazy, Saskatchewan,[57] and occur at a depth of 800–900 m below the surface.

The potassium content of potash is usually expressed in terms of the oxide of potassium (K_2O). Exploration in the Russell area has outlined minable reserves of 16.5 million tonnes averaging 25.4 percent K_2O, very rich deposits by world standards. In a joint venture, the province of Manitoba and Enterprise minière et chimique of France are studying the feasibility of developing this deposit. Although there is currently a world oversupply of potash, increased demand in this decade could necessitate the development of new mines by the year 2000.

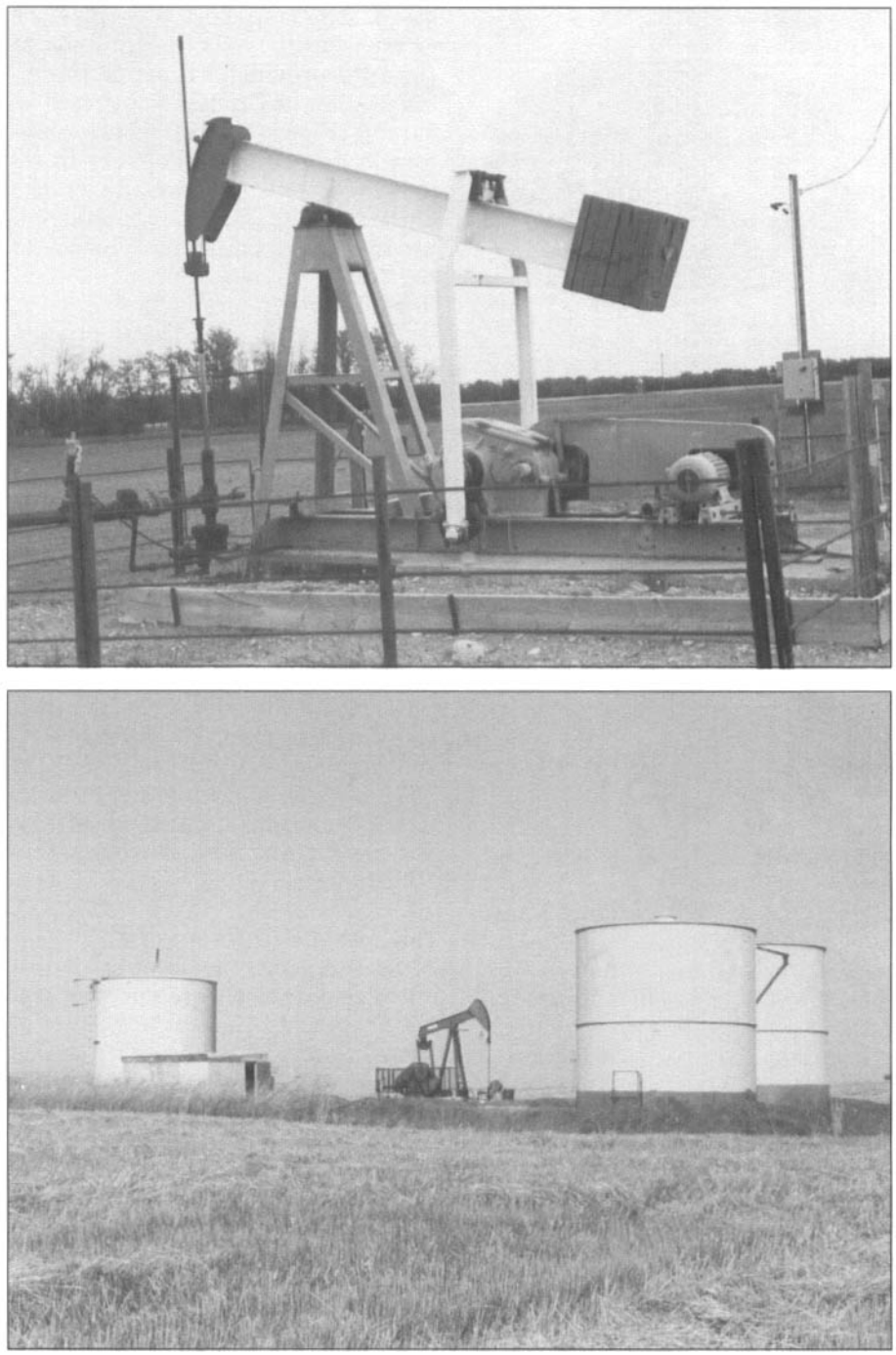

Figure 16.17(a) Oil Well Pump, Virden Area; (b) Oil Well Pump, Oil and Salt Water Storage Tanks, Whitewater Lake Field (Photographs: H. Young)

Magnesium Metal

Although dolostone is currently used as aggregate or in the production of dolomitic lime, it is also a potential source of magnesium metal. When mixed with aluminum, magnesium metal produces a lightweight and corrosion-resistant alloy utilized by the beverage-can and auto industries. The use of magnesium alloys in the auto industry is predicted to increase as auto manufacturers try to reduce vehicle weights significantly by the end of the century.

Exploration in the Sandridge region (approximately 75 km northwest of Winnipeg) has outlined proven and possible reserves of dolostone of 100 million tonnes, averaging 21.6 percent magnesium oxide and 0.23 percent insoluble residue.

The production of magnesium metal from dolostone is an energy-intensive process. However, the combination of large reserves of dolostone of the appropriate composition and low commercial power rates places Manitoba in a very competitive position for developing a magnesium metal industry.

Chromite

Chromite, the ore of chromium, is used in the production of corrosion- and heat-resistant stainless steel. Chromite occurs at Bird River, 30 km northeast of Lac du Bonnet. Although of low grade by world standards, this is one of the largest deposits in North America. Research is currently being conducted into the feasibility of producing a chrome-nickel master alloy, using the Bird River deposit, for use in the stainless-steel and specialty-steel industries. Transportation costs, which can double the price of material from South Africa (a major source of chromite) delivered to North America, may provide an incentive to develop this Manitoba deposit.

Kaolin

Kaolin, or china clay, is formed as a residual deposit from the chemical weathering of igneous rocks. It is used as a raw material in whiteware ceramics (tableware, sanitary ware) and electrical porcelain insulators, and as a filler in the paper, paint, and plastics industries. It is also used as a coating for high-gloss paper.

Deposits of kaolin overlie the Precambrian bedrock surface on Black Island (southern Lake Winnipeg) and kaolin–silica sand deposits occur in buried Paleozoic bedrock channels (e.g., Sylvan Channel) near Arborg.[58] The Sylvan deposit, which has been outlined in the subsurface by geophysical surveys, can potentially provide kaolin for a number of the processes mentioned above.

Kaolinitic shale was quarried south of Ste. Rose du Lac until the summer of 1990. The material was used by Red River Brick and Tile Company at Lockport for tile making until the plant closed in 1991.

Silica

One of the largest uses of silica-rich material is as a flux in the smelting of ores.[59] Silica sand is used in manufacturing glass, silicon-carbide abrasives, and silica-brick furnace linings; as foundry sand to make moulds into which molten metals are cast; and as a constituent of clay bricks and Portland cement.

Although some Pleistocene and Cretaceous sands have the potential to be used, or have been used, in various manufacturing processes, one of the most important sources of pure silica sand is the Ordovician Winnipeg formation on Black Island in Lake Winnipeg. Quarrying of silica sand on Black Island was discontinued in 1993. Previously, unconsolidated washed sand, containing 99.5–99.7 percent SiO_2 (silica) was shipped by barge to Selkirk for stockpiling. Subsequently the material was used in glassmaking, as foundry sand, for sandblasting, and as a filtering agent.

In 1992 Dow Corning Silicon Energy Systems Inc. completed a pilot plant at East Selkirk to evaluate technology for producing silicon metal.[60] Lump quartz and high-purity silica sand are being tested as feedstock.

Bentonite

Bentonite is a claylike material composed mainly of the mineral montmorillonite; it is derived from the alteration of volcanic ash. Acid-activated bentonite is used to decolourize and purify various animal, vegetable (e.g., canola, soybean), and mineral oils. Because of its adsorptive properties, bentonite is also used as pet litter and for floor-sweeping compounds.[61]

Bentonite was quarried along the Manitoba Escarpment near Morden from 1939 to 1990, and treated at a plant in Winnipeg. Although thick layers still exist in the Morden area, most bentonite used in Manitoba now comes from the United States.

Coal

Currently there is no commercial coal production in the province, but small-scale exploitation of lignite deposits at the western end of Turtle Mountain began as early as 1883.[62] Although mining continued in the Deloraine-Goodlands area until 1943, the thinness and discontinuity of the coal seams at Turtle Mountain make future commercial development unlikely, especially in view of the large-scale surface-mining operations at Estevan in southeastern Saskatchewan.

Petroleum

Although there has been extensive drilling in southwestern Manitoba during the past 40 years, there is still some potential for future development in the area.[63] A very high percentage of the wells drilled to date have been drilled only to Mississippian rocks, and many of these wells are either in, or adjacent to, existing fields.

Deeper horizons — such as the Birdbear, Duperow, Dawson Bay, Winnipegosis, Red River, and Winnipeg formations (Table 2.1 on page 12) — known to be productive elsewhere in the Williston Basin have been inadequately explored by deep drilling in Manitoba. To encourage oil companies to explore the deeper horizons in Manitoba, the provincial government has instituted deep-drilling incentive programs.

Some potential for development may also exist in the Hudson Bay Lowlands and Hudson Bay. The basin has been tested by a limited number of wells drilled between 1966 and 1985 at both onshore and offshore locations. While drilling provided useful geological information, no commercial oil accumulations were discovered.[64]

ACKNOWLEDGEMENTS

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Case Study 16.1
The Centennial Mine
Calvert C. Bristol

The Centennial Mine property is located about 12 km southeast of the city of Flin Flon, Manitoba, 1.5 km north of the Flin Flon Municipal Airport, within the Bakers Narrows Recreation Area (Figure 16.1.1). The orebody, a particularly good example of a volcanogenic massive sulphide (VMS) deposit, is now mined out. It was located beneath the waters of the North Arm of Athapapuskow Lake. The location of the mining operation in a populated, attractive recreational area, its proximity to the municipal airport, and the position of the orebody beneath the lake posed problems requiring innovative solutions. This, coupled with the relatively simple geological setting of the orebody, makes the mine suitable for description here.

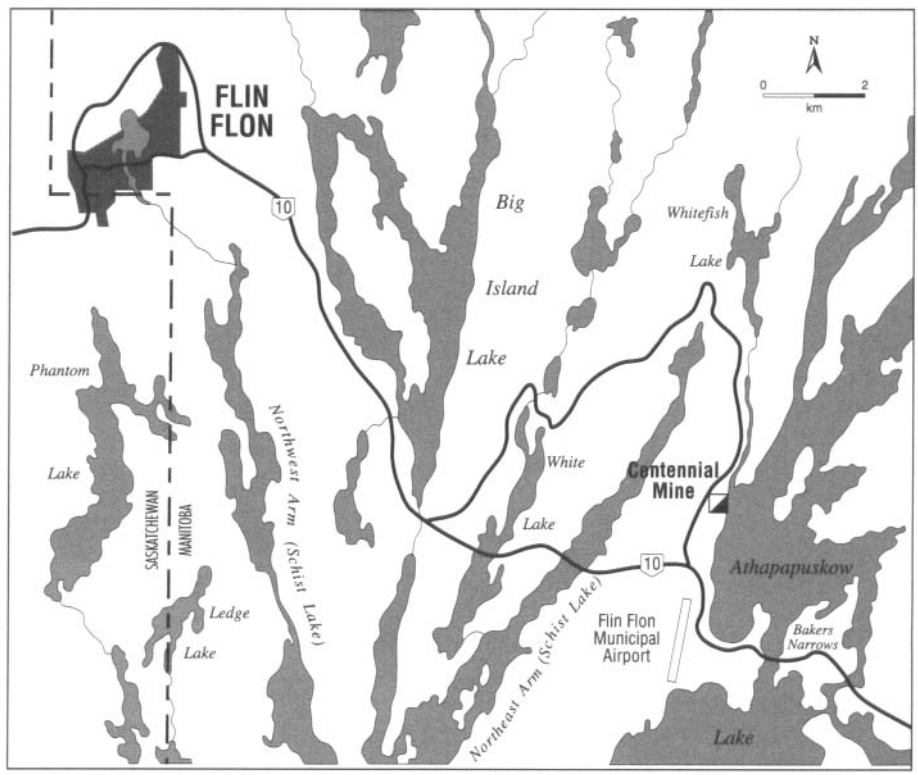

Figure 16.1.1 The Location of Centennial Mine

Discovery

The Centennial orebody was discovered in the winter of 1970 by the Hudson Bay Exploration and Development Company Ltd. Because the discovery coincided with the Manitoba provincial centenary, the mine was named for this event. Earlier geophysical exploration had revealed the presence of an electromagnetic anomaly, trending approximately north-south, beneath the North Arm of Athapapuskow Lake. Exploration drilling from the ice of the lake showed that graphite-bearing rocks were partly responsible, but that there was also copper and zinc mineralization of significant size and value.

Following initial exploration and evaluation, the Centennial property was turned over to the Hudson Bay Mining and Smelting Company Ltd. for development and operation as a producing mine. Access to the orebody and underground development allowing extraction of the ore took place from 1972 to 1974. Full-scale production commenced in 1975 and ended in 1988.

Geology

The Centennial orebody exhibits many of the geological characteristics of copper-zinc massive sulphide mineralization associated with volcanic and volcaniclastic rocks.[1] The orebody consists of a single lens, hosted by felsic volcanic rock characterized by siliceous fragments. This volcaniclastic rock, called "quartz porphyry" in mining terms, is stratigraphically graded; smaller fragments up to 5 mm long occur west of the ore zone in the foot wall,[2] and larger fragments up to 5 cm long are visible in the same rock unit east of the ore zone, within the hanging wall.

A volcaniclastic rock, distinct from the quartz porphyry and containing even larger clasts or fragments, lies stratigraphically lower than, and east of, the quartz porphyry. Except for the conglomeratic and arkosic rocks of the Missi Group, rocks near the orebody are of volcanic origin.[3] A plan and a vertical cross section, respectively, show the geology of the Centennial orebody and the principal mine openings (Figures 16.1.2 and 16.1.3).

Rocks in contact with the stratigraphic foot wall of the ore (those rocks now found east of the orebody)[4] and rocks to the north of the orebody were altered during ore deposition.[5] Theory for the deposition of volcanogenic massive sulphide deposits suggests that such deposits are precipitated by hot (up to 350°C), aqueous, volcano-related springs located in the floors of marine basins. In the Flin Flon area, such basins are related to the volcanism and concurrent with it.[6] In many examples, massive sulphide deposits are reasonably close to their volcanic source.[7]

Chemical reactions between ore-bearing solutions and materials of the basin floor, often of volcanic origin, have altered the latter. Ideally, only the rocks of the stratigraphic foot wall (the basin floor), would be altered, as much of the material of the stratigraphic hanging wall would have been deposited after the ore. In more complex examples, rocks of both the hanging wall and foot wall may be altered.

Wall rock alteration associated with the Centennial orebody is confined to the quartz porphyry volcaniclastic unit, where rocks found east of the orebody are characterized by chlorite-carbonate alteration. This alteration is adjacent to the contact throughout its length, but is particularly

well developed near the north end of the orebody. Quartz-sericite is characteristic of alteration in rocks along the western contact of the orebody, and is also better developed near the north end.

The ore consists of pyrite, FeS_2; chalcopyrite, $CuFeS_2$; sphalerite, (ZnFeMnCd)S; pyrrhotite, $Fe_{1-x}S$; minor arsenopyrite, FeAsS; magnetite, Fe_3O_4; tetrahedrite-tennantite, $(CuFe)_{12}Sb_4S_{13}$–$(CuFe)_{12}As_4S_{13}$; gold; and silver. Centennial ore appears superficially as a solid sulphide mass, but closer examination shows that it is finely but distinctly layered. Layers of chalcopyrite and sphalerite alternate with layers of pyrite, chert, and iron-bearing carbonate (ankerite). Together these minerals impart to the ore a strength that permitted a variety of open-stope mining methods.[8]

As in many massive sulphide deposits, the orebody was zoned. Copper content relative to that of zinc (Cu-Zn ratio) increased towards the east and north, corresponding to the degree of wall rock alteration. Thus, relative zinc values increased westerly, towards the stratigraphic hanging wall.

The orebody and adjacent rocks have been subjected to tectonism and are now slightly overturned, dipping about 75° east (Figure 16.1.3). The stratigraphic foot wall, which underlay the ore at the time of its deposition, is now the structural hanging wall (Figures 16.1.4 and 16.1.5).

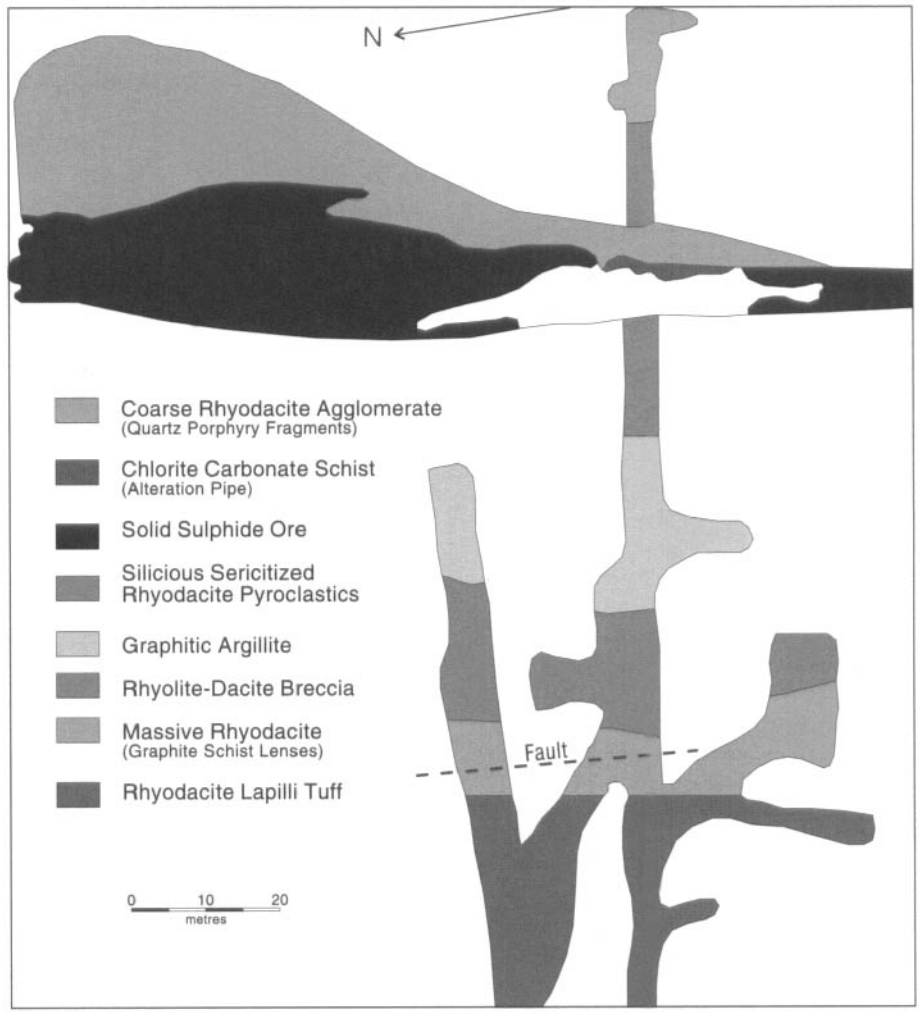

Figure 16.1.2 Plan of the 120 m Mine Level (Source: Adapted from N.M. Provins, "Geology of the Centennial copper-zinc mine deposit, Flin Flon Manitoba," Abstract in Canadian Institute of Mining and Metallurgy Bulletin *73[1980]:56)*

Mining

Proximity of the orebody to flight patterns associated with the Flin Flon Municipal Airport precluded underground access by traditional headframe, vertical shaft, and horizontal crosscut. Underground access to the orebody was achieved using a decline from a position west of the west shore of the lake, intersecting the orebody beneath the lake at the 120 m level (Figure 16.1.3). The use of a decline eliminated conflict between a headframe and air traffic, minimized surface expression of mining in a recreational area, and allowed the use of modern, more efficient, trackless mining methods.

At the 120 m level, horizontal access openings were developed into the orebody before production. After development of the 120 m level, an internal, underground vertical shaft was sunk from the 120 m level to the 480 m level. From this shaft, seven production levels and a crusher station were developed.

Sublevel, longhole open stoping was selected as the mining method for the Centennial operation (Figure 16.1.4). In this extraction method, a block of ore between mine levels and of the same width as the orebody is selected. Within the block sublevel, horizontal openings are developed in the ore at 15–20 m intervals, dividing the block into smaller portions and permitting access for longhole drilling.[9] The sublevel blocks are mined successively upward from the lower level until all smaller blocks comprising the original selected block are mined out. The ore in each sublevel block is blasted, allowing it to fall to the floor of the haulage level, where it is removed by scooptrams (underground front-end loaders).

In 1976 a newly developed method of open-stope extraction was introduced at the Centennial Mine: vertical-crater retreat (VCR) mining (Figure 16.1.5). In VCR mining, large-diameter, nearly vertical holes are drilled downward from one principal haulage level to the next level below (approximately 50 m). Explosives carried in plastic bags are suspended in the holes at appropriate depths so that each blast forms an arched crater on the bottom surface of the ore remaining in the block.

In this way, blocks of ore are mined upward, in a manner similar to normal open-stope, longhole mining but without the expense of developing sublevel openings. VCR mining produces better ore breakage and thus easier handling in

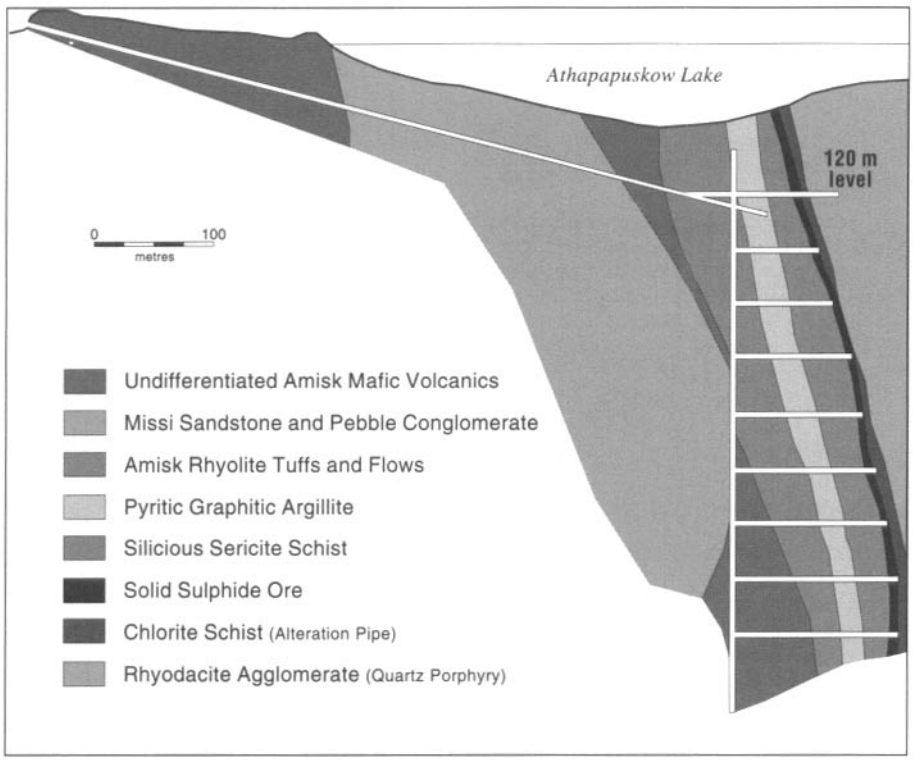

Figure 16.1.3 Cross-section of the Centennial Mine. View is to the north. (Source: Adapted from N.M. Provins, "Geology of the Centennial copper-zinc deposit, Flin Flon, Manitoba," Abstract in Canadian Institute of Mining and Metallurgy Bulletin *73[1980]:56)*

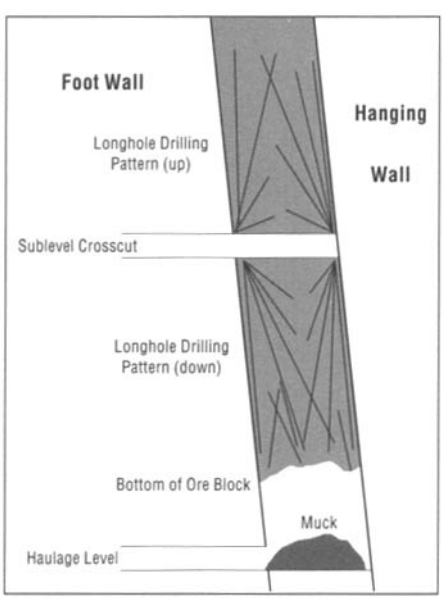

Figure 16.1.4 Cross-section Showing Open-stope Longhole Mining

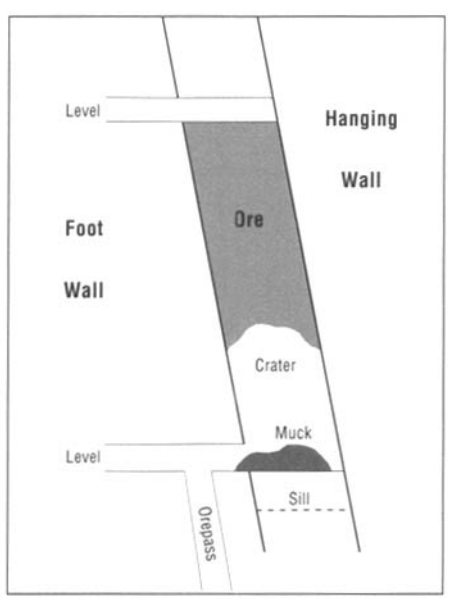

Figure 16.1.5 Cross-section Showing Vertical-crater Retreat Mining

haulage and crushing.

In the Centennial operation, ore passes allowed the ore to fall directly to the crusher station, where it was crushed to a size of less than 15 cm. From the crusher station the ore was conveyed to the loading pocket and then hoisted up the internal shaft to the 120 m level. It was then moved up the decline to the surface by conveyor. The crushed ore was trucked to Flin Flon for further treatment. No milling was done at the Centennial site.

Production

Initial estimates for the orebody were 1.4 million tons of ore containing 2.6 percent zinc, 2.06 percent copper, 0.04 ounces per ton gold and 0.70 ounces per ton silver. Records show that when production ceased in 1988, 1.624 million tons of ore had been mined, containing 2.50 percent zinc, 1.41 percent copper, 0.046 ounces per ton gold, and 0.59 ounces per ton silver. The larger tonnage and slightly lower grades for actual production reflect a slight amount of wall rock dilution, that is, wall rock mined through overbreakage.[10]

Environment

The low profile of the Centennial Mine operations has already been mentioned. Today very little evidence of mining remains at the site, although approximately one-half of the site is still in use. Manitoba Energy and Mines maintains an office in a trailer facility and stores drill core on the site. A local contractor has a small repairshop on the site. The waste rock produced by mine development has been used by the Manitoba Highways Branch and is no longer there. The Hudson Bay Mining and Smelting Company Ltd. has graded the site, trucked in dirt, and sodded the area to provide a base for regrowth of native vegetation.

Acknowledgements

Much of the material on which this article is based was generously provided by the Hudson Bay Mining and Smelting Company Ltd. In particular the generous and pleasant cooperation of Buz Trevor (Chief Mine Geologist), Larry Edel (Senior Mine Project Engineer), Wayne Fraser (Director Environment Control), Ross Conner (Property Acquisitions), Ted Baumgartner (Chief Exploration Geologist), and Don Birak (Vice President Exploration) is gratefully acknowledged. Any errors are the responsibility of the author.

NOTES

1. Volcanogenic massive sulphide ore deposits occur in volcanic terrains, are characterized by metallic sulphide ore mineralization (commonly copper, zinc, and lead, with minor gold, silver, and cadmium), and are often closely associated with aluminum- and silicon-rich (felsic), fragmental (clastic) volcanic material varying in particle size from dust to small boulders. The rocks hosting the ore may have been deposited directly from particle-laden, hot,

gaseous volcanic flows, or by streams washing clastic volcanic material downslope. For details see J.W. Lydon, "Volcanogenic Massive Sulfide Deposits Part 1: A Descriptive Model," *Geoscience Canada* 11(1984):195–202; J.W. Lydon, "Ore Deposit Models No. 14 Volcanogenic Massive Sulfide Deposits, Part 2: Genetic Models," *Geoscience Canada* 15, 1(1988):43–65; J.M. Franklin, J.W. Lydon, and D.F. Sangster, "Volcanic-Associated Massive Sulfide Deposits," *Economic Geology* 75th Anniversary Volume (1981):485–627; N.M. Provins, "Geology of the Centennial Copper-Zinc Deposit, Flin Flon, Manitoba," Guidebook, Canadian Institute of Mining and Metallurgy Fifth Annual District Four Meeting, Flin Flon, Manitoba, 1980, 1–6; N.M. Provins, "Geology of the Centennial Copper-Zinc Deposit, Flin Flon, Manitoba," Abstract in *Canadian Institute of Mining and Metallurgy Bulletin* 73(1980):56; R.R. Large, "Chemical Zonation and Evolution of Massive Sulfide Deposits in Volcanic Terrains," *Economic Geology* 72(1977):549–72; C.D. Spence and A.F. deRosen-Spence, "The Place of Sulfide Mineralization in the Volcanic Sequence at Noranda, Quebec," *Economic Geology* 70(1975):80–101; D.F. Sangster, *Precambrian Massive Sulfide Deposits: A Review,* Paper 72-22 (Ottawa: Geological Survey of Canada, 1972).

2. "Foot wall" is a geological and mining term indicating geological features of rocks located beneath the observer's feet. "Stratigraphic foot wall" indicates foot wall position at the time of rock deposition, not necessarily the present position. "Hanging wall" indicates the position of a feature overhanging or above the observer. "Stratigraphic hanging wall" indicates position in an ordered sequence of deposition, that is, not overturned. In the case of the Centennial orebody, the scene is more complex as the orebody and enclosing wall rocks have been slightly overturned through tectonism subsequent to deposition. Thus the rocks originally deposited as the stratigraphic-footwall rocks now overhang the observer, forming the present hanging wall.
3. A conglomerate is a coarse-grained, clastic, sedimentary rock consisting of pebbles or cobbles larger than 20 mm in diameter, set in fine-grained, clastic material (sand and silt); an arkose is a feldspar-rich sandstone.
4. Those rocks lying beneath the orebody at the time of deposition. See n. 2.
5. E.C. Syme and A. H. Bailes, "Stratigraphic and Tectonic Setting of Early Proterozoic Volcanogenic Massive Sulfide Deposits, Flin Flon," *Manitoba Economic Geology* 88(1988):566–89; Provins, "Geology of the Centennial Copper-Zinc Deposit."
6. Ibid.
7. Lydon, "Volcanogenic Massive Sulphide Deposits."
8. Stope: part of an underground mine from which ore is extracted, as opposed to development openings. An open stope is one without timbering; R. Conner, personal communication, April 1993.
9. A longhole is a 20–30 m drillhole used for blasting in open-stope mining; S.M. Trevor, personal communication, April 1993, June 1993.
10. W. Fraser: personal communication.

MANITOBA'S MANUFACTURING SECTOR

17

Daniel Todd

In the public eye, Manitoba's economic development has decidedly not been associated with manufacturing. Instead of factories and machinery, the public image attributes the province's well-being to a resilient and efficient farm sector, aided by forestry and mining in the northern fringes. Yet we must take pains to dispel this impression for three compelling reasons.

First, the facts simply contradict common perceptions, and at last manufacturing in Manitoba is a force to be reckoned with. In the late 1970s, at the peak of the long period of economic growth following World War II, Manitoba depended on manufacturing to provide 13.4 percent of its jobs, compared with 10 percent provided by agriculture. True, this fell short of the Canadian national percentage of 19.6, but it was substantially higher than in Saskatchewan and Alberta, where manufacturing accounted for only 5.8 percent and 8.4 percent of all jobs, respectively.[1]

The usurpation of agriculture's previously dominant role established manufacturing as the bedrock upon which Manitoba's fortunes would rest in the 1980s and beyond. As elsewhere in the Prairies, manufacturing in Manitoba had its origin in the agricultural economy (Case Study 17.1 on page 262), but food production in the Keystone Province has long been complemented, if not superseded, by a host of activities only tenuously related to agriculture. The simple fact that Winnipeg alone accounts for over 75 percent of the total provincial industrial labour force confirms that modern industry is essentially an urban pursuit, and a metropolitan one at that.[2]

Second, a modest manufacturing presence has for some time given the province a foil against periodic downturns in the volatile primary sectors. Clearly, the bulk of the work force engages in services that are overwhelmingly nonbasic activities. "Basic" in this sense refers to the ability of economic activities to effect export sales — indeed to rely on them for most of their turnover — whereas "nonbasic" applies to activities that thrive chiefly on sales made to domestic (i.e., Manitoba) customers.

Basic activities acquire the income necessary to sustain nonbasic activities, suggesting that the level of services ultimately depends on the fortunes of basic industries. Agriculture and mining long shouldered the burden of providing basic activities, but in recent years the province's export thrust has increasingly shifted to manufacturing. It takes no prophet to appreciate that manufacturing will become increasingly important in the 1990s, as problems affecting farming and mining assume alarming proportions.

Finally, manufacturing is generally acknowledged to be an asset worthy of promotion by any advanced society. At its best, it offers unparalleled benefits, perhaps most strikingly represented by such technical concepts as "income multiplier effect" and "employment multiplier effect," but equally adequately grasped through such evocative notions as good jobs, rewarding careers, and economic ripple-effects sufficient to purchase a spate of services: in short, all the accessories

consistent with a desirable material standard of living.

These benevolent multiplier effects are especially valued when they can be associated with export markets, because they would liberate the province's manufacturing from the limitations imposed by the absence of a large domestic market. Both federal and provincial governments, regardless of political stripe, believe that manufacturing is desirable in regional economies, and all officially proclaim their commitment to husbanding and promoting a healthy manufacturing sector. This firm belief in the merits of an industrial policy, has left its stamp on the province's industrial fabric.

A THUMBNAIL SKETCH

The importance of manufacturing in the province's economy is demonstrated by the garment industry, a longstanding symbol of Prairie manufacturing that bears no relation to the region's resource base. In 1990 this industry was represented by about 85 firms employing about 8,500 people (down from the 1980 peak of 9,500) who were responsible for circulating income of approximately $100 million throughout the local economy.[3] Heavily concentrated in Winnipeg, the clothing manufacturers bestowed on that city a standing in the national industry that compared favourably with Montreal and Toronto.

By virtue of its dominance of the province's urban system and associated infrastructure — for example, it boasts no less than 30 areas expressly zoned for industry — Winnipeg commands the lion's share of Manitoba's manufacturing. This dominance extends far beyond the garment industry, and spans the manufacturing spectrum. Perhaps typical is the C-MAC Industries plant, a medium-sized enterprise that produces digital transmission equipment for Northern Telecom.

C-MAC's Winnipeg factory focuses on three product lines: digital channel banks, digital subscriber carrier systems, and thick-film hybrid circuits. No less than two-thirds of its output is destined for markets outside the province. Started by Northern Telecom itself in 1982 as a $25 million investment, the plant steadily increased its production and work force, the latter growing from a modest 50 to an impressive 440 within five years.[4] The enterprise was sold by Northern Telecom to C-MAC Industries in 1993, joining an organization based in Sherbrooke, Quebec, that operates plants in Britain and the United States.

Figure 17.1 Distribution of Primary-processing Facilities in Manitoba (Source: From an original by Marjorie Halmarson)

Two concepts should be considered at this stage. The first is related to the provincial hinterland, and the second is germane to the dynamics of industrial systems. Although overshadowed by Winnipeg, the province's smaller urban centres frequently serve as locations of factories. As might be expected, these smaller communities customarily hosted industries that processed the rich harvest of resources in the hinterland. They were "materials-oriented" sites, conveniently positioned to avoid the costs that would be incurred in hauling unprocessed commodities to the larger centres.

Flour and feed milling is one such activity, and communities heavily reliant on it include Virden, Niverville, Landmark, Ste. Anne, and Otterburne (Figure 17.1). Agricultural processing extends far beyond flour and feed milling, however. Harrowby and Altona benefit from oilseed-crushing operations. Dairy processing is central to the prosperity of St. Claude, Morden, and Portage la Prairie, while Neepawa depends heavily on its hog-slaughtering plant. Thanks to local supplies of corn, Gimli is host to a major distillery.

Minerals are of prime importance in much of northern Manitoba, of course. Smelting and refining grew up in the immediate vicinity of nickel-ore extraction at Thompson, while Flin Flon enjoyed the presence of a concentrator and zinc-forming plant abutting its copper-zinc mines. Other settlements in the north (such as The Pas) and on the eastern fringe of the Canadian Shield (such as Pine Falls) rely on a

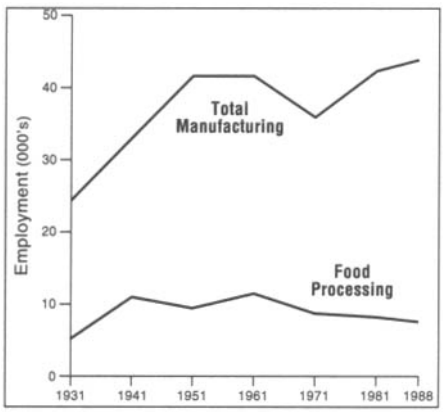

Figure 17.2 Employment in Manufacturing in Manitoba, 1931–88 (Source: From an original by Marjorie Halmarson)

combination of local forest resources and effective railway distribution for their sawmilling and/or papermilling operations.[5]

More recently, however, the smaller towns have garnered a sprinkling of so-called footloose industries. These are not integrated into the primary sector of the locality, and so are largely indifferent to concerns about transport cost. These neophytes seek non-metropolitan locations either because of labour-cost advantages or simply because their founders want to do business in their hometowns, presumably for quality-of-life reasons.

Manitou is an example of the latter. Fired with enthusiasm for the electric-light business, local entrepreneur Jack Lovell established a factory dedicated to producing streetlight transformers and electronic igniter systems. Founded in 1990, the firm set its sights on annual sales of $1.5–2 million; by 1991 it was employing 16 workers in a 418 m^2 facility. Relying on Manitoba Hydro for start-up orders, Lovell was later casting as far away as Britain for export contracts.[6]

Unfortunately, the glow of satisfaction arising from such examples is dimmed by the realities of business cycles and trade downturns. Manitoba was not spared the effects of the recession that gripped Canada at the beginning of the 1990s, and its manufacturing sector bore the brunt of "capacity rationalization" and "employment cutbacks." The need to be alive to the uneven nature of manufacturing conditions constitutes the substance of the second concept worth considering: the dynamics of industrial systems.

Its most arresting aspect is the elimination of factories, a particularly distressing process for smaller communities that must make do with limited job opportunities at the best of times.[7] Many of these places border on being "one-industry towns," and are acutely vulnerable to the injurious effects of business cycles.

A case in point is Morden, which was devastated by the closure in 1992 of the Tupperware plant, its largest employer, with the loss of 160 jobs. At a stroke, $3 million in annual payroll disappeared, with dire consequences for the town's retail sector. Reputedly, the plastics producer was forced to close as an unavoidable cost-cutting measure in a period of difficult business conditions. Moreover, the purported labour-cost disadvantage in Manitoba compared with the company's other plants in Tennessee and South Carolina does not augur well for a revival of manufacturing employment even in better times.

Another American firm that abandoned Manitoba as a production base, allegedly because of eroding viability, was the Campbell Soup Company, which closed its Portage la Prairie plant in 1991. However, any speculation on the vexatious question of the viability of plants is meaningless when done out of context and without a proper investigation of the relevant statistics.

STRUCTURE AND SIGNFICANCE

We rely heavily on government statistics, but sadly they are not immune to defects. In particular, it is difficult to accurately infer trends from the beginning of manufacturing in the province because of inconsistencies in data collection, changes in industry definitions, and variations in the degree of disclosure. However, long-term trends can be established for the period extending 1931–88, for which the data are tolerably complete.

Manufacturing employment climbed from 24,193 at the bottom of the business downturn in 1931 to 41,459 at the onset of buoyant economic conditions in the western world in 1951 (Figure 17.2). Perversely, the work force stayed close to this level for a long time, even dipping at the beginning of the 1970s before reverting to its earlier plateau. Indeed, although the manufacturing work force at the end of the 1980s was the largest in the province's history, it was not substantially greater than in 1951.

Aggregate figures can be misleading, however, because they mask the inexorable drive by manufacturers to mechanize and automate industrial production, which enhances the capital intensity of manufacturing at the expense of numbers of workers. In short, an increase in work force numbers in the 1970s and 1980s, during which the labour forces in other industrial societies were shrinking, speaks well for the dynamism of the manufacturing sector in Manitoba during those years.

Although the proportion of total employment ascribed to manufacturing fell slightly to 12.8 percent in 1988 compared with the 1978 peak of 13.4 percent, this compares favourably with the even steeper decline of agriculture: from 10 percent to 7.5 percent. Equally noteworthy, this vibrancy occurred in the face of both absolute and relative erosion in the scale of the work force devoted to food processing, the traditional bulwark of provincial manufacturing.

Accounting for 4,722 workers in 1931, this industry reached a high of 9,647 employees in 1961 (Figure 17.2); the number slipped to just above 7,000 by 1981 and was 6,359 by 1988. The industry had accounted for 19.5 percent of total manufacturing employment in 1931 and peaked at 29 percent in 1941 (when the statistics are questionable owing to wartime restrictions). Since 1961, it has suffered an appreciable decline, dropping to 14.2 percent in 1988. By that year, food processing had not only been passed by clothing as Manitoba's leading manufacturing industry but was also being strongly challenged by other industries.

Figure 17.3 shows the relative performance of other critical industries compared with the food-and-

beverages mainstay. The striking decline in the manufacture of transportation equipment is immediately apparent. In 1931 this industry had an even larger work force than food processing, but this can be attributed to the Great Depression, when the railways continued to function despite the collapse of the agricultural sector. The decline of the railways in the years that followed destroyed the commanding position of the industry. The emergence of a flourishing aircraft-manufacturing component did not compensate, in strictly numerical terms, for the disappearance of railway-engineering jobs. By 1988 the industry had declined to a fraction of its former size.

In contrast, clothing employment more than doubled between 1931 and 1988, and the electrical- and electronic-products (EEP) industry expanded threefold during 1961–88. The growth in these two sectors offset much of the shrinkage in the food-and-beverages and transportation equipment sectors. In addition, primary metals — the linchpin of heavy industry — secured a niche that accounts for about 5 percent of Manitoba's manufacturing labour pool.

While the five principal players in Manitoban manufacturing contribute strongly to the overall direction of industrial development, they do not necessarily comprise the bulk of manufacturing employment. They employed one-half of the total manufacturing work force in 1988, less than their 1931 proportion of 54 percent but more than the 47 percent in 1951.

An instant and vivid appreciation of the changes that have taken place in the industrial composition can be gained from the construction of Lorenz Curves, in which cumulative employment is plotted against industries. Perfect diversification, in which each industry enjoys an equal share of total employment, is represented by a straight 45° line (Figure 17.4). Any deviation from the 45° line represents a move away from perfect diversification towards increasing specialization. Indeed, the greater the divergence of the curve from this line, the more specialized is the regional economy.[8]

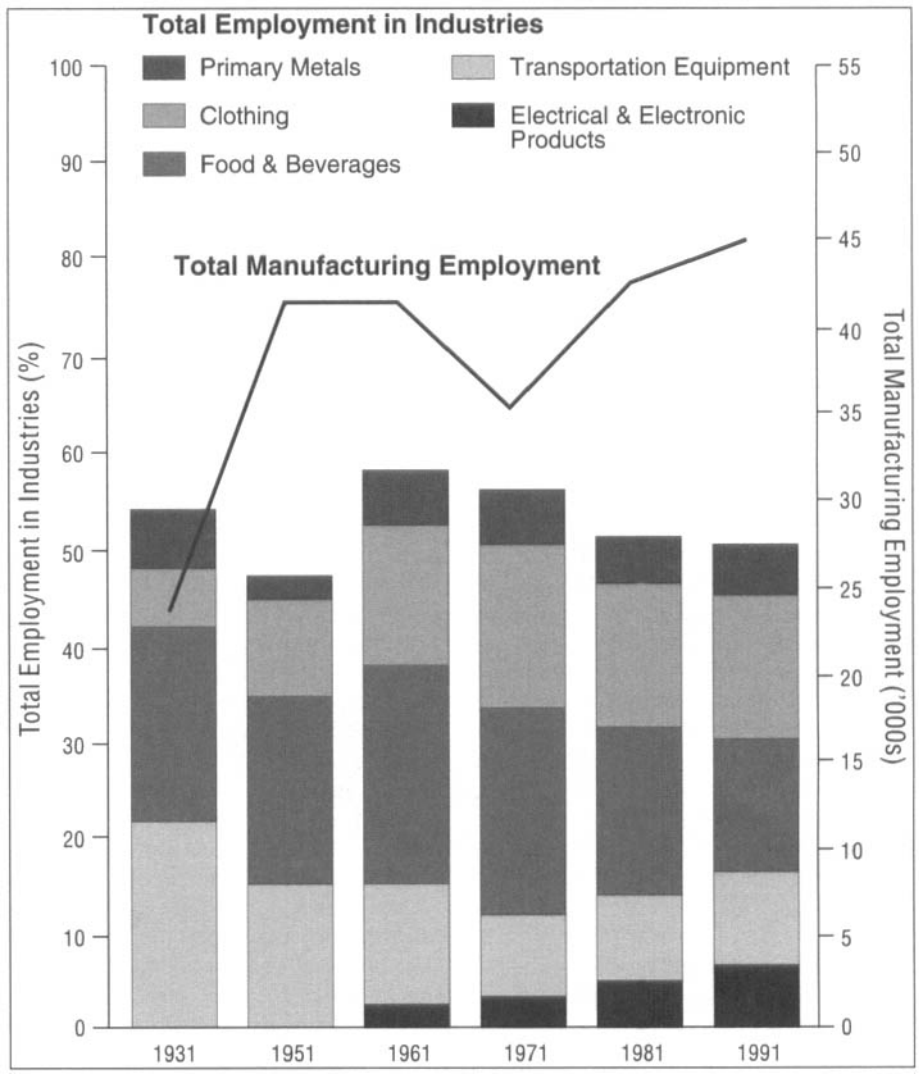

Figure 17.3 Employment in the Principal Manufacturing Industries in Manitoba, 1931–91 (Source: From an original by Marjorie Halmarson)

Figures 17.4 and 17.5 permit us to generalize the evolution of Manitoba's manufacturing between 1931 and 1988. Three findings stand out. First, Manitoba was decidedly specialized in 1931 but has become discernibly less so in the years since (Figure 17.4). Second, this trend towards diversification should not be overstated, as it pales in comparison with the performance of Alberta (Figure 17.5). In 1931 both Alberta and Saskatchewan were much more specialized than Manitoba; by 1988, however, Alberta had become more diversified than Manitoba while Saskatchewan remained considerably less diversified (Figure 17.5). Third, Figure 17.5 emphatically confirms that, these changes notwithstanding, Manitoba's economy remains noticeably more specialized than that of Canada as a whole, but the difference is less than it used to be.

While important, employment numbers mask the structure of industries, and this is a serious deficiency. Industrial structure is tied to the interrelated questions of market maturity and the technical development of the production processes used by manufacturers. The structure of an industry determines to a large extent its future well-being. All industries progress through a life cycle that links their formative stages to old age (senescence) by way of infancy, adolescence, and maturity. Mature and senescent activities are past their heyday (well past in the latter case); as a result, they have little likelihood of future expansion and a high probability of decline and extinction.[9]

Conversely, infant and adoles-

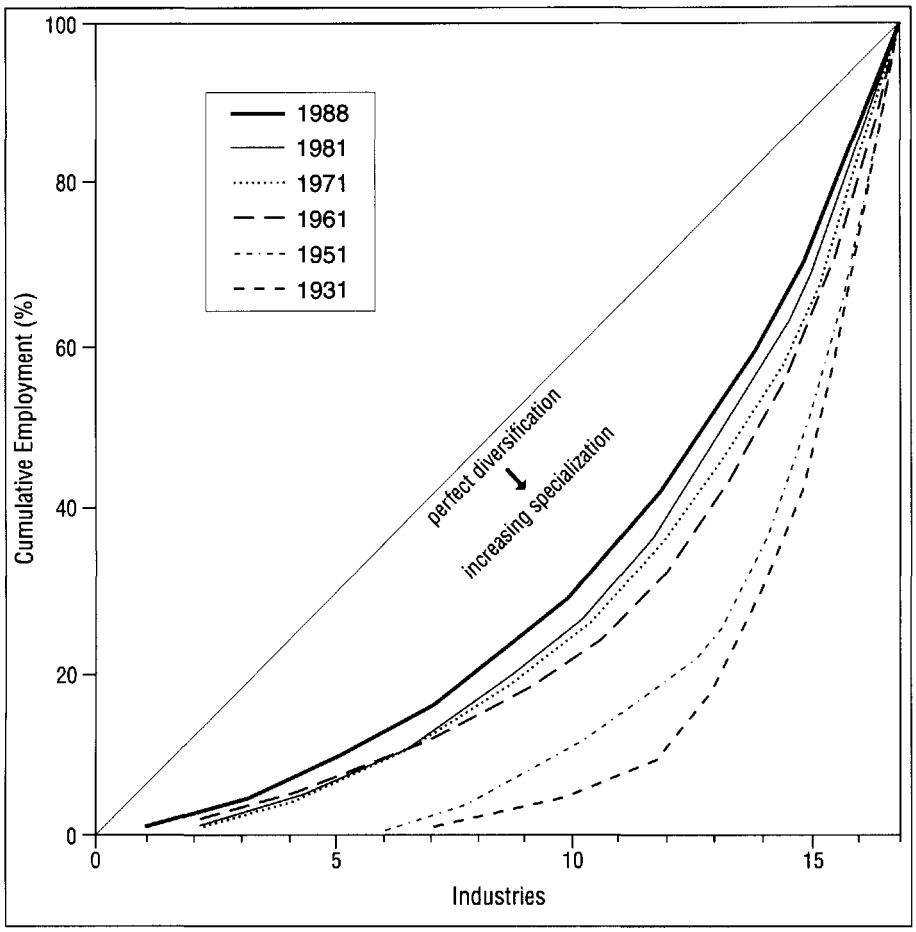

Figure 17.4 Specialization of Manitoba's Manufacturing 1931–88. By convention, when curves are plotted for different times for one location, they are shown below the 45° line for perfect diversification. (Source: From an original by Marjorie Halmarson)

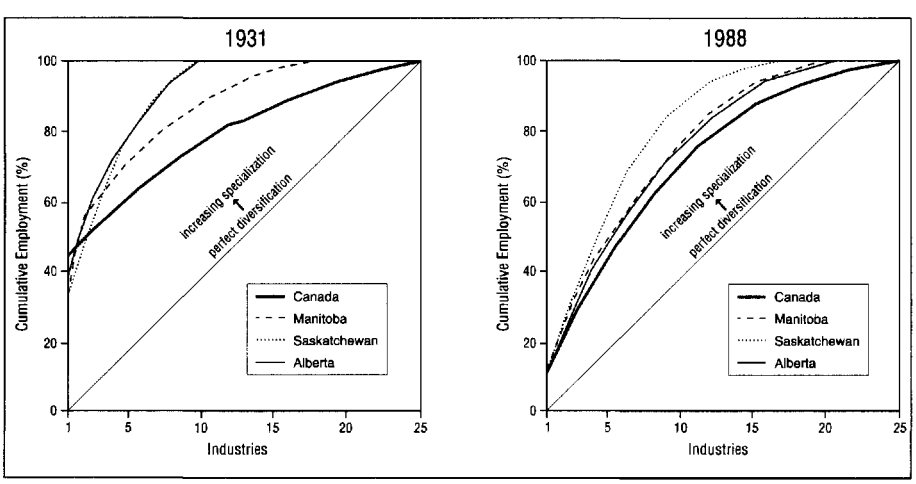

Figure 17.5 Relative Specialization in Manufacturing: National, Regional, and Provincial, 1931 and 1988. By convention, when curves are plotted for several locations at a specific time, they are shown above the 45° line for perfect diversification. (Source: From an original by Marjorie Halmarson)

cent activities are still forging new process technologies and introducing new product lines, both of which help to open up fresh markets at home and overseas. Such activities promise a prolonged period of expansion and the prospect of an improved economic fabric for their host communities, with all that this entails in terms of income and employment multiplier effects.[10] Technology-intensive activities, otherwise known as high-tech industries, are by their very nature conducive to innovation, to the generation of new products and markets, and to the spawning of new enterprises to make them.

How does the issue of industrial structure impinge on Manitoba's manufacturing sector? To varying degrees, the food-and-beverages, clothing, primary-metal, and transportation equipment industries all fall into the mature and senescent categories, even while looming large in Manitoba's contemporary economic profile. Their conspicuous presence in the provincial economy guarantees them a place in any list of Manitoban benchmark industries, that is, industries vital to the province's economic well-being.

At the other end of the life-cycle spectrum, Manitoba is solidly represented by two classic high-tech activities: the EEP (electrical and electronic products) industry and the aerospace industry. In the eyes of statisticians, much of the aerospace industry is seen as an integral part of the transportation equipment industry, a fact that obscures its performance but improves the case for including transportation equipment in the list of benchmark industries.

Location quotients are standard tools of regional analysis, formulated to gauge the importance of provincial employment in a particular industry compared with the national importance of the industry concerned. The quotient rests on the proposition that, all things being equal, provincial representation of any given industry should correspond in importance in the local economy exactly with the industry's standing in the national arena. Any quotient greater than 1 implies a greater-than-proportionate share of that industry in the province; any value below 1 indicates a less-than-proportionate share.[11]

On this basis, the food-and-beverages industry has been overrepresented in Manitoba throughout the period 1931–88, although the extent has varied (Table 17.1). In striking contrast, transportation equipment, flagrantly overrepresented in 1931, had become marginally underrepresented by 1988, a testament to the decline of railway engineering even in the face of an

expanding aerospace industry. Clothing, a major mature industry, stubbornly registered quotients greater than 2 after 1951; in contrast, the mature primary-metal industry persistently fell below 1 during the same period.

The EEP industry offered perhaps the best omen. From small beginnings, its modest quotient of 0.32 in 1961 grew steadily to 0.89 by 1988 — still below 1, to be sure, but with a rising trajectory unmatched by the others. Besides reflecting the growth prospects of electronics operations in particular and high-tech manufacturing in general, the EEP record owes something to government efforts to foster an environment amenable to industrial development ("industrial policy").

Table 17.1 Location Quotients of Benchmark[1] Industries, 1931–88

Industry	Year					
	1931	1951	1961	1971	1981	1988
Food and beverages	1.27	1.81	1.57	1.71	1.41	1.29
Clothing	0.97	2.06	2.00	2.29	2.42	2.11
Primary metal	-	0.53	0.88	0.84	0.77	0.84
Transportation equipment	3.93	1.76	1.48	0.93	0.98	0.85
Electrical and electronic products (EEP)	-	-	0.32	0.48	0.57	0.89

Note:
1. For definition see text.

Source: Calculated from Statistics Canada data.

INDUSTRIAL POLICY

Many measures can be included under the heading of "industrial policy," but since few have brought tangible results, I shall concentrate on current initiatives. The discussion will be blended with a case study of an actual industry, one that is a byword for high technology, judged capable of ushering Manitoba manufacturing into the next century: the aerospace industry. First, however, it is necessary to present some background regarding the general approach to regional industrial development.

The Fund for Rural Economic Development (FRED), a joint federal-provincial program, was in effect for a decade after 1966. It touched Manitoba with respect to the Interlake area and, besides other endeavours, attempted to implant industrial enterprises in such communities as Selkirk and Gimli. A brave albeit doomed venture paralleling the FRED thrust, undertaken with the backing of the then Manitoba Development Corporation, was the bid to establish aircraft manufacturing in Gimli.[12]

Less-focused regional development schemes devolved to the federal Department of Regional Economic Expansion (DREE), which after 1974 pressed the provincial authorities to cooperate in formulating General Development Agreements. Envisaged as flexible frameworks, these agreements failed to live up to expectations on a number of issues, not least of which was industrial development. The successor agency, the Department of Regional Industrial Expansion (DRIE), attempted to make amends after 1982, but its efforts were scarcely under way before the department succumbed to bureaucratic reorganization.

In due course, DRIE's Manitoba responsibilities, including those involving industrial promotion, were assumed by a separate federal agency dedicated to administering the so-called Western Development Fund. This was yet another attempt to achieve the elusive objective of tailoring economic development to the needs of particular regions, in this instance Manitoba.[13] All this was a prelude to the present-day situation, in which the remnants of longstanding federal initiatives aimed at fostering manufacturing across the board have been complemented by provincial measures geared towards encouraging specific industries.

Canadian regional industrial development policy has been roundly criticized for its diffuse aims and lack of attention to technology-intensive sectors.[14] Conceding the point, governments in recent years have stressed the vital importance of high-tech activities and, with varying degrees of success, have embraced measures designed to promote them.[15] Not to be outdone, Manitoba has devised its own package of promotional aids. Under the auspices of the Department of Industry, Trade, and Tourism, the package is a blend of provincial and federal instruments conveniently divided into financial programs, manufacturing adaptation (helping firms adopt new technologies), technology commercialization (facilitating the transfer of technology from the laboratory to the production line), business-start programs (boosting entrepreneurship for start-up enterprises), and support for feasibility studies.

Financial programs consist of a number of schemes administered with a view to encouraging research and development (R&D); especially noteworthy are investment tax credits, the Industrial and Regional Development Program, the Defence Industry Productivity Program, and the Technology Support Through Procurement Scheme. They can be supplemented by supports for direct productive investment such as loan guarantees, interest subsidies, and equity holdings, which bracket together federal development goals (expressed through the Western Diversification Initiative) and provincial high-tech manufacturing objectives.

Aerospace has been earmarked for prime consideration, and an Aerospace Technology Program has been established to coordinate public and private industrial aid. Having designated aerospace one of Manitoba's five priority development sectors in 1978, the government justifies its commitment on two counts.

First, in keeping with industry life-cycle theory, the industry offers good growth prospects: sales grew from $92 million in 1978 to about $500 million in 1991, while employment rose from 2,400 to nearly

5,000. Moreover, the planners believe that the prospects in commercial aviation are so propitious as to counter declining military markets. A conservative estimate indicates that sales will equal $630 million by 1995. Second, the economic impact of aerospace — as monitored through multiplier analysis — is outstanding, and decidedly superior to the manufacturing average.[16] In light of these sterling characteristics, the industry's presence in Manitoba warrants treatment in more detail.

Dating from 1930 with the founding of MacDonald Brothers Aircraft, a branch of a Winnipeg sheet-metal shop, the aerospace industry began in a small way, confining itself to the repair and later the fabrication of aircraft floats and other components.[17] Profiting greatly from war work, MacDonald entered air-frame manufacturing and operated a government-built plant at the Winnipeg airport that by war's end employed some 4,500 workers. The war was also instrumental in inducing Standard Aero to initiate air-engine repair operations at the same site, thus establishing the core of a future Winnipeg-centred industrial complex.

The inevitable defence cutbacks after 1945 caused much instability, and employment initially plummeted. However, beginning in the 1950s, a semblance of stability returned and, along with it, slow but steady growth. In effect, the complex was integrated into the international industry as a result of acquisitions (e.g., MacDonald was taken over by the British Bristol firm and became part of Rolls-Royce, whereas Standard became a division of the United Kingdom's Hawker Siddeley, later part of British Tyre and Rubber) and the erection of subsidiary factories (e.g., Boeing Canada Technology and Unisys Canada Defence Systems).

Consisting of nine main firms in Winnipeg and a larger group of subcontractors both inside and outside the city, the Manitoba aerospace industry engages in everything from aircraft overhaul to the manufacture of rockets and aviation electronics. For example, Bristol Aerospace produces rocket propellants at its Rockwood plant, 35 km north of Winnipeg. In fact, the aerospace industry is so diverse as to fall within the formal Statistics Canada definitions of both EEP and transportation equipment, thus neatly including two of the classic high-tech industries. Particularly useful is the fact that two-thirds of its output by value is destined for export markets, especially those in the United States.

In addition, as a major user of automated, computerized production techniques, the industry is prized for its pathfinder role, enhancing the status of Manitoba's manufacturing sector at large. The combination of advanced technology and an international outlook, so evident in the aerospace industry, raises the question of the future of Manitoba manufacturing in an era of increasing international competition.

THE FUTURE OF MANUFACTURING IN MANITOBA

With the dawning of the 1990s, Canada's manufacturing sector found itself operating under the Free Trade Agreement (FTA) with the United States (Case Study 17.2 on page 264), suddenly confronting unbridled competition from American rivals. Furthermore, as part and parcel of the FTA, Canadian industry was given notice that it would be progressively deprived of government subsidies: regional industrial development grants were outlawed in principle and, for the most part, would be phased out.

In Manitoba the policy-makers will be obliged to honour legally binding clauses of the FTA both in letter and in spirit. The option of bailing out uncompetitive industries by government fiat is eliminated, and firms must reconcile themselves to an environment in which efficiency dictates price-competitiveness, which in turn determines survival.

This stark message is consistent with industry life-cycle theory, which states the terms to which all manufacturing firms are subject. In entering into a market, the firm thrives on the merits of its product in the first place (the reward for innovation), but in the second place thrives increasingly on profits from savings accrued in labour, capital, and transport costs (reflected in price-competitiveness), as the product and its affiliated processes become standardized. Mature firms, dependent on standard products and processes, are especially sensitive to factor costs such as labour and transport.

In both respects, Manitoba has disadvantages, demanding higher wages for its work force than is customary in many parts of the United States and, because of its relatively remote location, imposing higher transport costs on its firms than areas located close to major markets. These problems, already working to the disadvantage of hinterland industry, are likely to become more severe once the North American Free Trade Agreement (NAFTA), which includes Canada, the United States, and Mexico, takes root (Case Study 17.2 on page 264).

Some pundits gloomily proclaim that Canada will fare badly in such a context, losing mature industries to sites south of the Rio Grande, which offer much lower labour costs and which promise, once standard process technology is transferred, equivalent productivity rates. It takes little forethought to appreciate that the key Manitoba industries of clothing and food processing would be vulnerable to intensified competition from newly established Mexican rivals. As we have seen, these industries are disproportionately represented in Manitoba, even though the province's relative dependence on them has decreased over the years with the push to industrial diversification.

Fortunately, much of that diversification has occurred because of the development of high-tech industries, which are far less likely to forsake the province for labour-cost advantages elsewhere. Moreover, spurred by the recession and the FTA, government and industry favour cultivating the existing high-tech base. In their view, encouragement of R&D does not contravene the NAFTA ban on direct industrial subsidies, but it does suffice to provide a vital ingredient for dynamic technology-intensive industries.

High-tech industries not only promise to provide the province with replacement jobs for possible losses in mature industries but also promise well-paying jobs because of the high-value nature of technology-intensive products. This combination of high incomes and high-value products generates strong multiplier effects, producing a strong basic sector capable of sustaining an enlarged nonbasic sector. In addition, high-tech industries have a growth potential that extends far into the future: they can evade pressures to seek cheaper labour that pervade industries marked by mature, standard technologies.

On the strength of arguments such as these, planners have marshalled support for ventures variously denoted as science parks, technology parks, or innovation centres.[18] Manitoba is fully committed to cultivating industries such as aerospace and EEP, and has also embraced the science-park idea. A $21 million biotechnology R&D centre, commissioned in 1992, is clear testimony to the official belief that new enterprises will be spawned by sponsoring innovation.[19] In its own inimitable style, Manitoba is facing up to the challenges of the future by gambling on novel technologies and the industries that may emerge from them.

NOTES

1. *Financial Post,* 24 November 1979, C14.
2. According to Statistics Canada, Winnipeg employed 78.4 percent of the province's industrial work force in 1986 while producing 71.3 percent of the value of its industrial shipments.
3. *Winnipeg Free Press,* 27 October 1990, 46.
4. *Winnipeg Free Press,* 28 November 1987, 37.
5. M. Appana, "An Analysis of Factors Influencing the Location of Manufacturing Industries in the Prairies" (M.A. thesis, University of Manitoba, 1975).
6. *Winnipeg Free Press,* 17 August 1991, 15.
7. J.S. Brierley and D. Todd, *Prairie Small-Town Survival: The Challenge of Agro-Manitoba* (Lewiston, NY: Edwin Mellen, 1990).
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Case Study 17.1
Brandon's Manufacturing: The Agricultural Connection

Paul J. Curtis

Brandon's initial advantage over its immediate neighbours as the manufacturing centre of western Manitoba was due more to historical accident and the technologies of the 1880s than to geographical factors. The fuel and water requirements of the steam-driven locomotives of the day necessitated a divisional point for these commodities approximately every 200 km. This coincided with the distance between Brandon and Winnipeg, the point from which western railway expansion began. A dispute over land prices in the established community of Grand Valley on the north bank of the Assiniboine caused the Canadian Pacific Railway to locate its divisional point approximately 3 km west of Grand Valley, which quickly resulted in that settlement's demise and the rapid expansion of the new settlement, Brandon.

Brandon possessed nothing that made it inherently attractive as a manufacturing site – neither raw materials nor market. Its *raison d'être* was purely as a service centre, and as such its situation was much more important than its site. This statement is as true in the 1990s as it was in the 1890s. During the past century no raw materials have been discovered to attract large-scale manufacturing, while population growth both within the city and in the surrounding hinterland has not been sufficiently large or rapid to promote industrial expansion. This has resulted in a relatively weak manufacturing sector compared with Canada as a whole, and in recent years there has been a marked drop in the percentage of the labour force involved in manufacturing (Table 17.1.1 and Figure 17.1.1).

The one source of raw materials that has been constant is agriculture. Manufacturing within the city has always reflected this fact; over the period 1931–81 the percentage of Brandon's manufacturing labour force engaged in the food-and-beverages industry ranged between 22.6 and 40.4. Information distributed by the city in attempts to attract industry always lists agricultural products as sources of raw materials, and gives the acreages of various crops, the total number of various animals, and other agricultural information about the surrounding area.

Table 17.1.1 Percentage of Labour Force of Brandon and Canada Engaged in Manufacturing

Labour Force	1931	1941	1951	1961	1971	1981	1991
Brandon	10.5	11.2	10.6	11.1	9.0	10.0	6.8
Canada	16.0	21.4	15.8	21.7	19.6	19.1	14.4

Source: Dominion Bureau of Statistics/Statistics Canada.

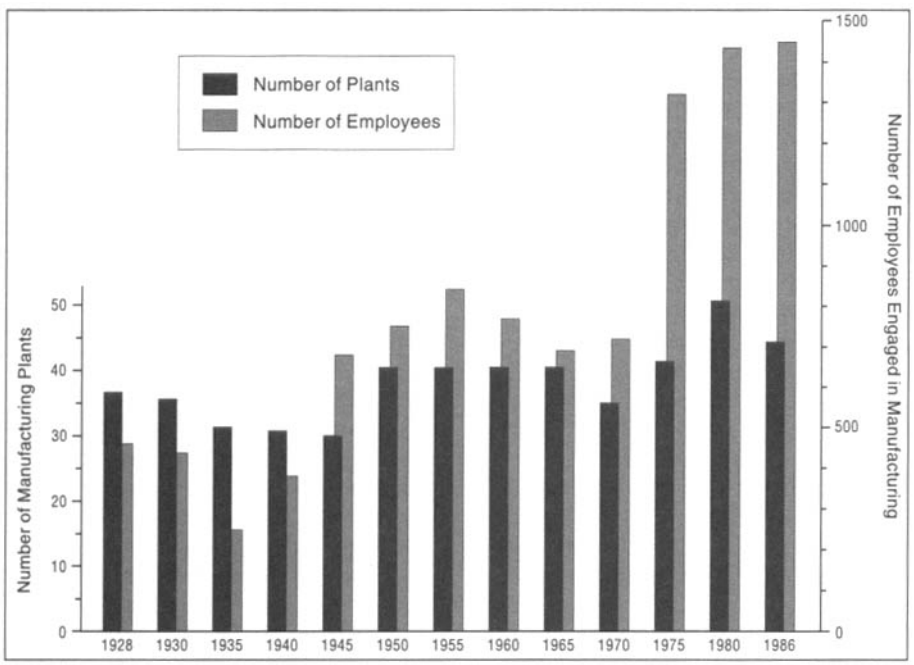

Figure 17.1.1 Number of Manufacturing Plants and Employees in Brandon, 1923–86 (Source: 1930–57, The Financial Post Business Yearbook *[Toronto: The Maclean Publishing Company]; 1958–80,* The Financial Post Survey of Markets *[Toronto: Maclean Hunter Ltd.]; 1982–86,* Canadian Markets *[Toronto; Maclean Hunter Ltd.])*

Moreover, agriculture is not only a source of raw materials for manufactured products but also the market destination of the products. While early records and publications refer to flour mills, rolling mills, breweries, and meat-packing plants, today's industries include specialized meat-processing plants such as Macey Foods, which is engaged in the production and processing of waterfowl, and feed mills such as Cargill Nutrina Feeds and Feed Rite Ltd. These companies obtain their raw materials directly from the hinterland, process them, and then return them as finished products to the hinterland, which now acts as a market.

The situation has changed little over the past 30 years. Of 18 major enterprises established in Brandon between 1965 and 1968, 10 were directly related to the agricultural base. For example, Pool Packers Ltd., the McCabe Grain Livestock Yard and Auction Market, and Metev Woollen Mills processed agricultural raw materials, whereas others, such as Simplot Chemicals and Dryden Chemicals, made products for use in the agricultural industry.

Not all manufacturing industries receive their raw materials from the Brandon region, but even when raw materials are brought from further afield, it is the agricultural market that is the main location factor. For example, Behlen Industries, which makes agricultural machinery, metal grain bins, and grain boxes for farm trucks, imports metals that are then processed in the city.

Another characteristic of Brandon's manufacturing is the importance of the small locally owned and operated establishment. An example of such a small "family industry" is the Cancade Company Ltd. Started in 1920 in Belleview, Manitoba, by Pierre Cancade as a blacksmith and garage business, the company originally manufactured a variety of products from granaries to windows to coffins. In 1945 it moved to Brandon and concentrated on meeting the needs of the agricultural hinterland, producing such items as binder-drive conversions, grain cleaners, chaff savers, harrow bars, wagons, wagon boxes, and truck boxes. Today, Cancade Company continues to adapt to the ever-changing markets, listing among its products grain boxes, hoists, roll tarps, hopper bottom trailers, and truck decks.

Typical of such small family-based firms is the relationship between management and employees, who almost take on the status of extended family members. Such firms with such relationships have provided the backbone of Brandon's small but constant manufacturing base.

While the contemporary manufacturing scene in the city is dominated by a few large employers, with Simplot Chemical, Hooker Chemicals (formally Dryden Chemicals), Behlen Industries, and Inventronics each employing over a hundred employees, the backbone and the stability of the manufacturing scene lie in establishments employing 25 or fewer persons. In 1985, 25 of the 48 manufacturing firms in Brandon had fewer than 25 employees, and the situation is little different today. Although there has been a slow, steady growth in the number of manufacturing firms in the city, this simply reflects a similar growth of population within the city limits and the surrounding hinterland.

Distance to major markets has been a drawback to large-scale manufacturing in Brandon. Although located directly on both the Trans-Canada Highway and the main Canadian Pacific rail line, Brandon is nevertheless unable to attract large-scale manufacturing to the area (Figure 11.2.1 on page 164). Assembly costs for raw materials and distribution costs for finished products are too great to make large-scale manufacturing viable. Unable to gain effective access to national and international air routes, high-tech footloose industries that are less tied to raw materials and distribution

costs continue to find the city inaccessible.

What was true of Brandon's manufacturing scene in the past is likely to remain true for the foreseeable future. Unless the city gains access to a locally produced raw material vital to a particular industry but unavailable elsewhere, or unless it gains cheap and reliable access to the major North American markets through improved transportation links, it is probable that manufacturing in the "Wheat City" will remain small in scale and tied to its agricultural base, both servicing and being serviced by the hinterland.

Case Study 17.2
The Effect of the North American Free Trade Agreement on the Manitoba Economy
John Ryan

From our earliest history, free trade has been a very divisive issue for Canadians. Although most Canadians opposed the Free Trade Agreement (FTA) in the 1988 election, the opposition parties split the vote; with only 43 percent support, the Conservatives formed a majority government and enacted the trade agreement on 1 January 1989. Opposition to the FTA increased, but in the summer of 1992, the federal government concluded a draft of the North American Free Trade Agreement (NAFTA) with the United States and Mexico.

During the federal election of 1993, the Liberals promised that if elected they would renegotiate NAFTA, and if this were not possible, that they would abrogate the agreement. They were elected with a massive majority. The Liberal government's attempt to renegotiate NAFTA was firmly rebuffed by the United States, but instead of taking steps to abrogate the treaty, the government quickly ratified it with no changes whatsoever. NAFTA went into effect on 1 January 1994. Most of the features of the FTA are included in NAFTA, which now supersedes the FTA.

The effect of the FTA and NAFTA on the economy of Manitoba is ongoing, and at this stage it is still difficult to quantify. Because of their overall effect on Canada, Manitoba cannot be considered in isolation. Since 1989 the Canadian economy has been devastated by a major recession, the causes of which include the FTA, an accompanying recession in the United States, and federal-government policies of high interest rates, a high Canadian dollar, and gradual abandonment of universal social programs. Before assessing the FTA/NAFTA, it is essential to understand its underlying purposes and objectives.

The federal government, big-business interests, and most of the media have portrayed the FTA/NAFTA as being an instrument to eliminate tariffs and to increase trade with the United States and Mexico. An examination of the texts of both the FTA and NAFTA reveals that the major emphasis is not on tariffs and trade per se but limiting the powers of the nation-state to intervene in the economy.[1] An extra feature of NAFTA includes intricate "rules of origin" requirements designed to keep out foreign competitors while favouring American-based multinationals. NAFTA also includes protection for "intellectual property," such as software, patents for seeds and drugs, and so on. Provisions such as these insure that American-based corporations control the technology of the future. Canada is now unable to launch any type of industrial strategy (a key feature of Japan's success), and corporations can challenge environmental regulations, health and safety requirements, and the like as "unfair restraint of trade."[2]

Although it is still too early to comment on the effects of NAFTA, there is substantial evidence of the effects of the FTA on the Canadian economy, and on Manitoba in particular. In matters of trade, both the United States and Canada increased their exports of goods and services to each other after the FTA, but the United States far more so than Canada; for example, the United States trade deficit with Canada in 1987 was $11.3 billion but by 1991 it was only $6.0 billion.[3] In the two years before the FTA, Canada's current-account balance with the United States had a surplus of $5.8 billion, but after two years of the FTA, Canada had a deficit of $2.8 billion.[4] During the years of the FTA, Canada had the highest unemployment of all G-7 countries.[5] Canada's manufacturing jobs have decreased by 23 percent since 1989, compared to a loss of only 6 percent in the United States.[6]

Manitoba's trade deficit with the United States has increased since the FTA came into effect, and manufacturing jobs have decreased. Also, in 1991 Manitoba was last among the provinces in terms of economic growth.[7] However, it is difficult to assess the exact role of the FTA in the overall economic downturn.

In Manitoba, the garment industry represents 15 percent of the manufacturing work force. Producers report that they are losing a significant share of the Canadian market to American imports because of the FTA; but at the same time, except for only one producer, they are not making gains in the American market. Most garments manufactured in Manitoba are made from foreign fabrics, but NAFTA's "rules of origin" will now subject the industry to massive tariffs. The industry claims that the provisions of NAFTA will result in a job loss of about 35 percent within five years.[8]

With the FTA/NAFTA, Canada is being restructured into a north-south alignment, to the detriment of Manitoba. As a result of deregulation and the FTA, 30 percent of Canada's trucking firms have failed, and in Manitoba the industry has seen a 20 percent drop in revenue and a 25 percent drop in distance travelled. The Canadian railway industry has experienced a major decline in revenue as well, with layoffs in the tens of thousands, many in Manitoba.[9]

To comply with NAFTA and pressure from American-based drug industry multinationals, the Canadian government enacted Bill C-91 in 1993, which will devastate the generic-drug industry in Canada. Almost immediately, a major expansion of the generic-drug industry in Manitoba

was cancelled.

The United States has long sought to eliminate the Canadian Wheat Board, headquartered in Winnipeg, along with other marketing boards, in order to clear the way for American agribusiness giants such as Cargill. With NAFTA, this may yet come to pass.

Successes of the FTA in Manitoba include a doubling of livestock sales since 1988 and increased exports to the United States of wood products, electrical machinery, plastics, and windows. However, exports have declined in furniture, nonelectrical machinery, meat products, and paper products. Many plant closures, such as those of the Campbell Soup Company plant in Portage la Prairie and the Tupperware plant in Morden, are attributed to the FTA.[10]

The FTA and NAFTA have placed limitations on Canada's sovereignty in a broad range of areas, including the control of our energy and water resources. In fact, as long as NAFTA remains in force, our resources will be "North American" resources.[11]

NOTES

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MANITOBA'S WATER RESOURCES

18

John Welsted

SURFACE WATER

During the 1980s, car license plates in Manitoba referred to the province as the land of 100,000 lakes. While this gives a false impression of the relatively dry south, it is certainly a good indicator of the north, where large-scale maps display a bewildering maze of lakes and rivers. Taking the province as a whole, 15.6 percent of the total area is water,[1] including some very large lakes.

Of 565 lakes in Canada over 100 km^2 in area, 74 are wholly or partly located in Manitoba; among them are Lake Winnipeg (the 6th-largest lake in Canada), Lake Winnipegosis (11th), and Lake Manitoba (13th) (Case Study 1.1 on page 6).[2] These lakes are well known to southern inhabitants — they fish in them, swim in them, sail boats on them, and so on — but some in the north, such as Tadoule Lake and Nejanilini Lake, are virtually unknown despite their large size. Whether large or small, well known or little known, most of Manitoba's lakes are directly or indirectly the result of the most recent glaciation of the province (Chapter 2).

All of Manitoba's waters flow to Hudson Bay, much of the province lying within the drainage basin of two of Canada's major river systems, the Saskatchewan-Nelson and the Churchill (Figure 18.1). All of the more heavily populated area of southern Manitoba lies within the massive Saskatchewan-Nelson drainage basin, which also includes parts of Alberta, Saskatchewan, and Ontario as well as parts of the states of Montana, North Dakota, and Minnesota.

Lake Winnipeg is a giant holding tank, collecting water from the west, south, and east, which then drains north to Hudson Bay by the Nelson River. Major rivers entering Lake Winnipeg include the Saskatchewan from the west, after passing through Cedar Lake; the Red from the south, after it has received the Assiniboine from the west; and the Winnipeg from the southeast (Figure 18.2). Dauphin Lake, Lake Manitoba, and Lake Winnipegosis drain into Lake Winnipeg via the Fairford River. Outside the Saskatchewan-Nelson drainage basin, a large area of the extreme north is drained by the Seal River, and south and east of the Nelson much of the northeast of the province is drained by the Hayes River and its tributaries, the Gods River and the Fox River.

This drainage system results in Manitoba being located "downstream from everyone else,"[3] in that most of the major streams flowing through the province rise in another province or state. Only the Hayes River and the Seal River in the north rise within the province. Equally rare are streams that rise in Manitoba and flow into some other jurisdiction. In the south the Pembina rises near Killarney and flows into North Dakota to join the Red at Pembina, and further east two small tributaries of the Roseau River — Sprague Creek and Pine Creek — rise in Manitoba and flow into Minnesota. In the north, the Thlewiaza flows into the Northwest Territories and on to Hudson Bay.

One obvious disadvantage of this downstream location is that the province is dependent on the use — and misuse — of rivers by other

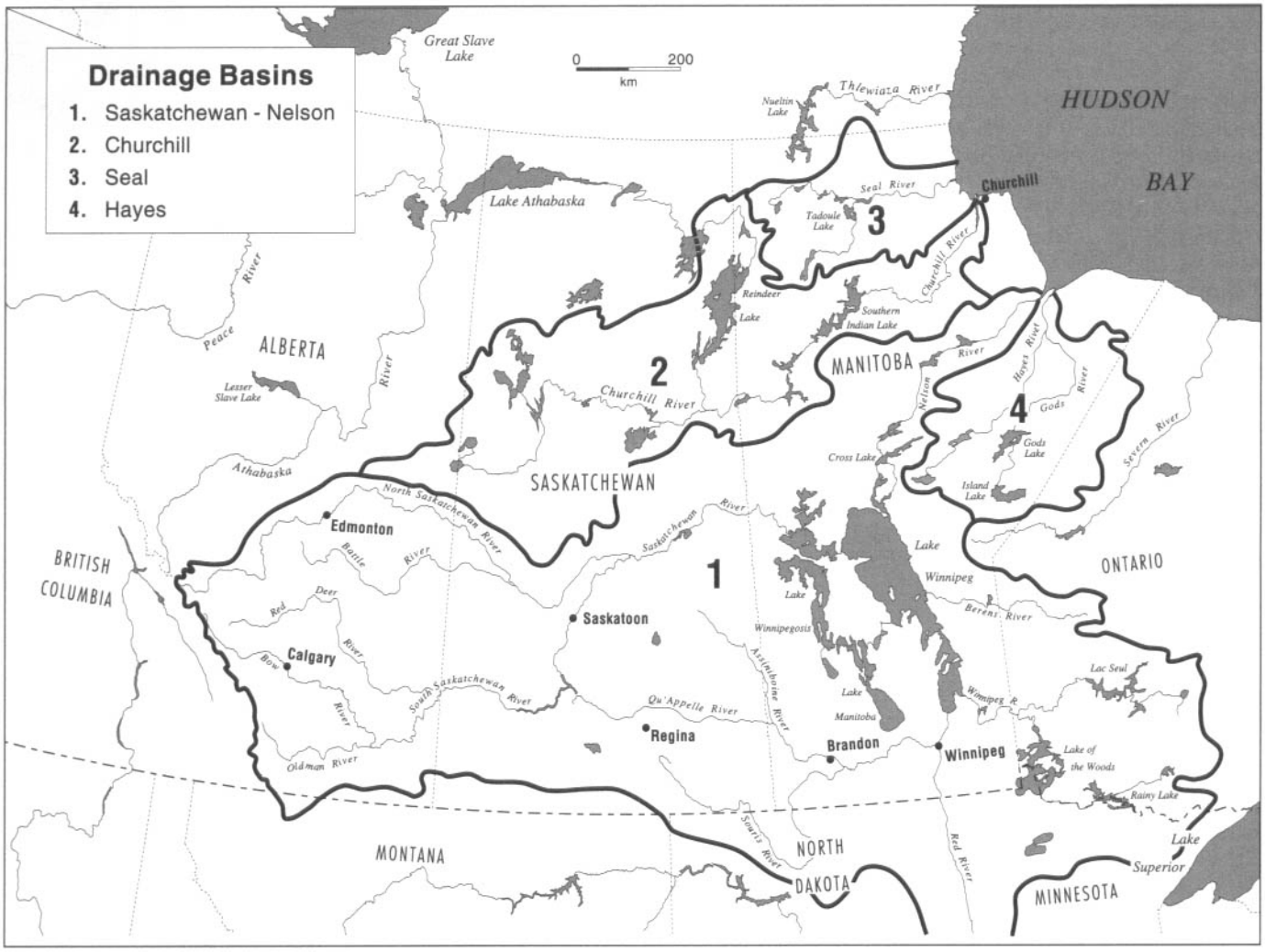

Figure 18.1 Drainage Basins of Manitoba

provinces and states. Virtually all the major rivers flowing into Manitoba have been manipulated for human use, affecting both the quantity and quality of water that reaches the province.

On the other hand, Manitoba usually does not have to consider the effects of its water resource projects on other jurisdictions. The most controversial project in Manitoba during the past 20 years — the diversion of the Churchill into the Nelson for power generation — does not affect provinces other than Manitoba. Had the Churchill been flowing into Ontario, it is unlikely the diversion would have occurred.

GROUND WATER

Documentation of the distribution and amount of ground water is difficult because it cannot be seen and is very unevenly distributed, depending on the underlying geology. However, the Ground Water and Water Well Act of 1962 requires drillers to submit a report of each well drilled, indicating depth to ground water and the amount and quality of water encountered. These data, together with some detailed studies at specific locations, have enabled a picture of the province's ground water — at least in the southern part of the province — to be drawn and displayed on two maps published by the Water Resources Branch of the Manitoba Department of Natural Resources.[4]

The most widespread bedrock aquifer is in carbonate rocks — limestone and dolostone — that extend in a broad band from northwest of Cedar Lake to southeast of Winnipeg. Wells in this aquifer generally yield more than 1.0 L per second, with some high-capacity wells yielding as much as 100 L per second. Although the water is salty in some areas, it is mainly good to fair in quality.

Sand and gravel aquifers are directly or indirectly of glacial origin. Of particular note are those associated with glacial lakes. One of them — the Assiniboine Delta Aquifer — which extends over 3,900 km^2 in south-central Manitoba, was deposited by the Assiniboine into the western part of glacial Lake Agassiz and is the largest unconfined aquifer in the province[5] (Figure 18.3). Further west, the Oak Lake Aquifer is associated with sands and gravels deposited into glacial Lake Hind. One aquifer that did not originate in a lake is the Winkler Aquifer, a buried esker.

WATER USES

Humans have learned to use water for a great variety of purposes, some

of which reduce the total quantity of water in natural sources (the so-called consumptive uses) and some of which do not (nonconsumptive uses). Water use with the water remaining in its natural location is termed "nonwithdrawal" use; in withdrawal use, the water is removed from its natural source.

Transport

One of the earliest nonconsumptive, nonwithdrawal uses of water was for transport. The rivers and lakes of Manitoba have been used as transportation routes since the earliest days of human occupation, starting with the canoe, which was the standard form of transport for the Aboriginals of the area during the summer. In winter, frozen lakes and rivers were among the principal trails followed by the nomadic hunting tribes.[6]

Later, the waterways were used as exploration routes during the initial European penetration and during the fur trade era. "By the early 1600s explorers searching for a North-West passage to India had mapped the estuaries of the Seal, Churchill, Nelson and Hayes rivers on Hudson Bay."[7] A series of forts was built at or near the mouths of some of these rivers. York Factory, located near the mouth of the Hayes River, became the most important. It "became the central shipping and receiving port for the Hudson's Bay trade for over 150 years," and the Hayes River the chief route into what is now central Manitoba.

The Hayes was followed to the beginning of its western arm, where it is close to the valley of the Echimamish River, which flows to the Nelson. "This was the 'York Boat' route followed by boats from York Factory which brought, first, the traders and, later, the settlers to western Canada."[8] It was by this route that Kelsey, Henday, and Hearne began their journeys inland, and this was the route followed by the Selkirk settlers to the Red River (Chapter 6).[9]

The route to the west was via the Saskatchewan River, which flows into the north end of Lake Winnipeg across what was a turbulent 5 km stretch known as Grand Rapids. "Explorers, fur traders, missionaries and settlers all portaged the difficult rapids."[10] This was originally accomplished by pulling the cumbersome York boats over log rollers, but as the boats got bigger, the Hudson's Bay Company (HBC) built a tramway to by-pass the rapids.[11]

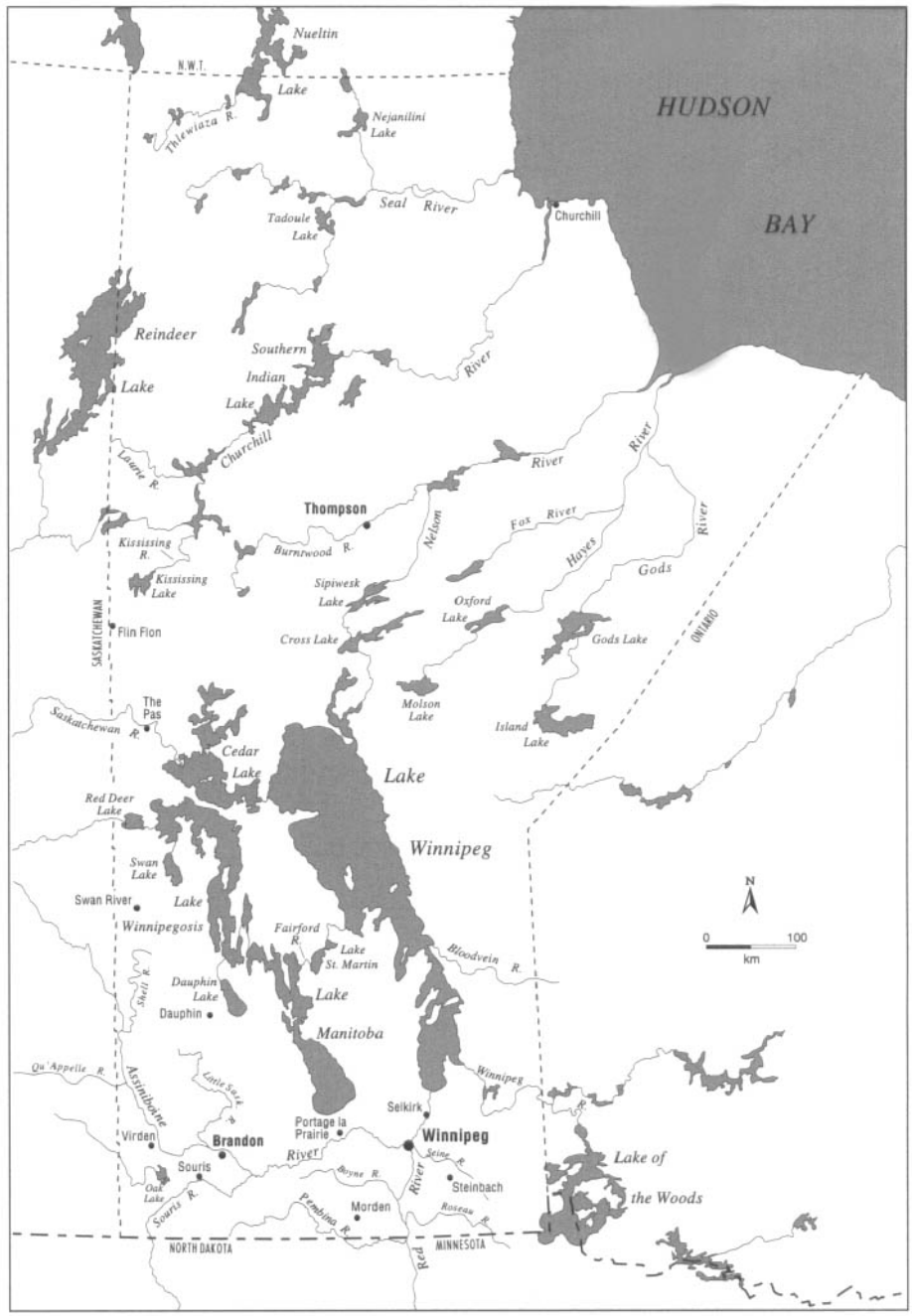

Figure 18.2 Rivers and Lakes of Manitoba

The Hayes and the Saskatchewan were by no means the only routes used for exploration and navigation. La Vérendrye travelled down the Winnipeg River, as did the voyageurs of the North West Company (NWC), despite the fact that at one stage they encountered 10 portages in a single day. They then crossed Lake Winnipeg and followed a route via Grand Rapids to the Churchill River.[12]

The Churchill was used as a route, although not as frequently as the Hayes. Its importance "as a supply route for the fur traders gradually declined with the settlement of the west. However, the route remained of great value to the explorers attempting to reach the Arctic from the interior since it led to the MacKenzie River."[13]

In the south, La Vérendrye fol-

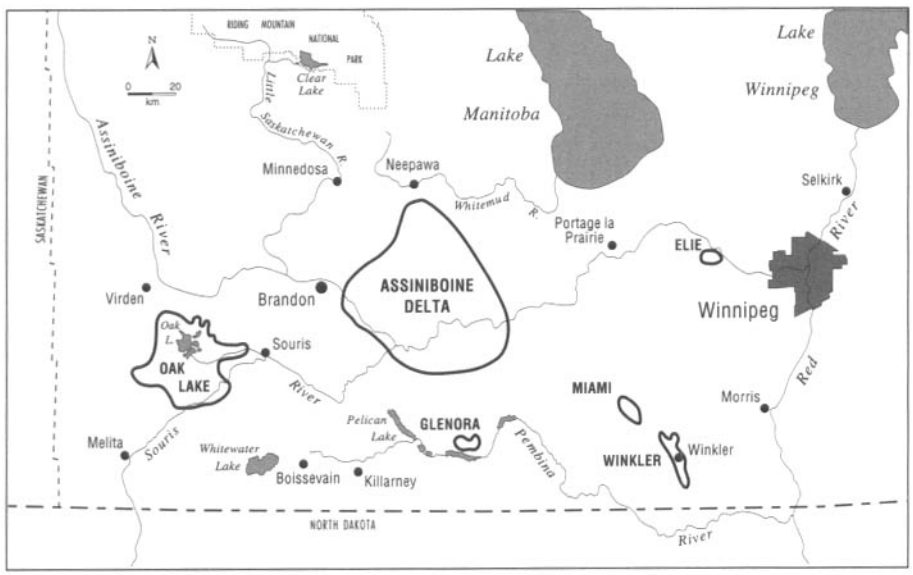

Figure 18.3 Sand and Gravel Aquifers of Southern Manitoba (Source: Modified from A.M. Shady, Irrigation, Drainage and Flood Control in Canada *[Ottawa: n.p., 1989], figure 9.3)*

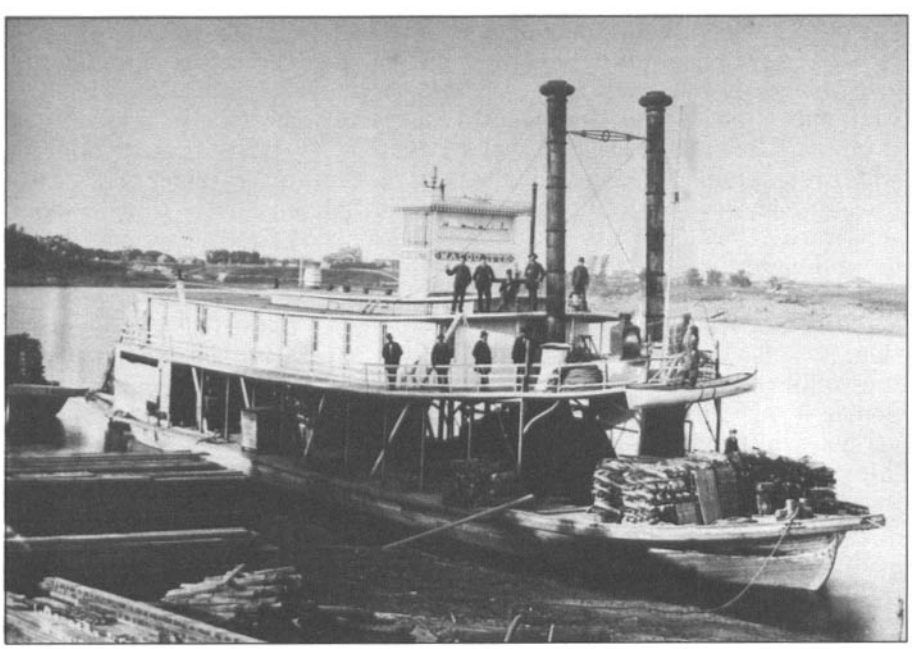

Figure 18.4 The Marquette, *Docked at Winnipeg about 1883. Wood for fuel is piled at the front of the boat. The* Marquette *operated on the Assiniboine River between Winnipeg, Fort Ellice and Fort Pelly from 1879 to 1883. (Photograph: PAM, Collection: Transportation-boat-Marquette)*

lowed the Assiniboine and established Fort La Reine near the present site of Portage la Prairie. Later, both the NWC and the HBC used the Assiniboine as a route and established a series of forts just above its junction with the Souris. Mapmaker David Thompson followed parts of both the Assiniboine and the Souris in his travels.[14]

Steamboats became important in the 19th century, especially on the Red and the Assiniboine, these rivers being mainly free of rapids although their meandering route made travel lengthy and time-consuming. On the Red, the first steamship was the ungainly *Anson Northup,* which first docked at Fort Garry on 10 June 1859.[15] Later a fleet of steamships carried freight and passengers between St. Paul, Minnesota, and Winnipeg.[16]

On the Assiniboine, traffic was initially between Winnipeg and Portage la Prairie, but subsequently ships reached Brandon, overcoming rapids at Currie's Landing just below the present city, and eventually penetrated to Fort Ellice, near the junction of the Qu'Appelle. By 1878 three ships plied the Assiniboine, but "the 'Navy' was busiest in 1881 when the *Marquette* [Figure 18.4] and the *Alpha* were joined by the *Northwest,* the *City of Winnipeg* and the *Manitoba,* in carrying both freight and passengers to the Rapid City Landing (Currie's) and Grand Valley."[17]

Steamboats also operated on Lake Manitoba and Lake Winnipeg, some even ascending the Grand Rapids to work on the Saskatchewan River.[18] But the steamship era was short-lived; by 1882 railway lines could carry goods and passengers to many of the places previously reached by water. Services on both the Red and the Assiniboine declined, with the *S.S. Alpha* being the last steamship to travel through Currie's Landing in 1883.

The use of rivers and lakes for transport other than for pleasure is now almost limited to Lake Winnipeg, although even here commercial shipping has experienced a steady decline.[19] Winter roads across lakes and along rivers are still used extensively and intensively in the north (Case Study 12.2 on page 175).

Municipal Water Use

The availability of a readily accessible surface-water supply for human consumption and other uses was an obvious attraction for human settlement in Manitoba. Even in the driest areas of the southwest, a river, stream, lake, or slough was close by, and initially settlers did not have to worry about obtaining an adequate supply of clean water. However, increased demand associated with population growth, conflicting demands for different uses, and the degradation of both surface and ground water has resulted in a less satisfactory situation, especially in the south-central and southwestern parts of the province.

Municipal water use now includes far more than water used for human consumption, which in fact is a relatively minor element of total use. In this context, it is conven-

tional to divide municipal use into domestic use (about 45 percent in Manitoba), commercial/institutional (16 percent), industrial (18 percent), and system losses and water that is unaccounted for (22 percent).[20]

Industrial water use is a relatively small component of municipal use in most settlements because major industries usually have their own supply; nevertheless, the requirements of even small industries can place a strain on the municipal supply because the water goes through the treatment system even though treatment may be unnecessary. Even worse, the municipality has to cope with the treatment of industrial wastes, which can severely tax the municipal sewage treatment system.

In 1989 municipal water use in Manitoba averaged 329,000 m^3 per day, a large amount until compared with Ontario, which used 4,489,000 m^3 per day.[21] On a world scale these figures are very high: Canadians as a whole use more water than they need. At 360 L per person per day, they are the second-largest water users in the world, behind only the United States.[22]

Municipal water supply sources can be grouped into four categories: rivers, lakes, reservoirs, and ground water. Over 95.6 percent of Manitoba's municipal water is from surface supplies, with the rest coming from ground water.[23] Increasingly over the last decade, problems have arisen with respect to some of these sources. For example, the Red-Assiniboine Basin has been identified as a potential water-deficient area in the future, although this is not entirely the result of municipal use.[24]

Winnipeg does not rely on its rivers — the Red, the Assiniboine, and the Seine — for water supply; since 1919 it has obtained its water from Shoal Lake, an arm of Lake of the Woods, once regarded as an assured source of clean water. Even here, however, the prospect of a cottage development and of mining on the shores of the lake caused concern about pollution of the water and increased treatment costs for the city.[25] Perhaps the assured supply from Shoal Lake has made Winnipeg unconcerned about surface-water quality. Little of the waste water from the city receives treatment before entering the Red River, making the stretch below Winnipeg the most degraded of all Prairie rivers, despite the fact that the Red is a source of drinking water for Selkirk and for vegetable and fruit irrigation in the valley.[26]

Both Brandon and Portage la Prairie take water from the Assiniboine. While the flow of the river has been strengthened by the building of the Shellmouth Dam near Russell, both cities are vigilant about potential changes in the flow. Both were concerned about a proposal to divert water from the Assiniboine near Rathwell — downstream from Brandon but upstream from Portage la Prairie — to improve the water supply for the communities on the western part of the Red River Plain.[27]

Although it has been suggested that operation of the Shellmouth Dam could be modified so that more water is available for release during the summer,[28] the city of Brandon is considering the possibility of a ground-water source as a backup supply. Portage la Prairie, located downstream from the Souris junction, has also been concerned about the influence of projects along the Souris — initially the Garrison Diversion Unit in North Dakota[29] and later the Rafferty-Alameda Project in Saskatchewan.[30]

A few communities that rely on ground water face the prospect of a limited supply. Winkler in particular is mining the Winkler aquifer[31] and is one of several communities that could benefit from the diversion of water from the Assiniboine. However, as of May 1995 Winkler and other Red River Valley communities seem to have switched interest to the Red as a possible water supply.

Water Use in Industry

Water use in industry is complex because so many subsectors are involved and water is used for many different purposes. Despite this, some figures are available. In 1986 Manitoba industries had a gross use (water intake plus recirculated water) of 252 million cubic metres (mcm), a large quantity but small compared to the big three (Ontario, 7,069 mcm; Quebec, 3,646 mcm; and British Columbia, 2,265 mcm).[32] Most of the water for these industries was self-supplied, and most of it was surface water rather than ground water. Across Canada, the big three industrial water users are the paper and allied-products industry, the primary-metals industry, and the chemical-products industry. In Manitoba the food-and-beverages industry is in third place.[33]

Gross water use in the mineral industry in Manitoba in 1981 was 21 mcm per year, less than all other provinces except Nova Scotia, New Brunswick, and Prince Edward Island. Virtually all of this was used in metal mines, and virtually all was self-supplied surface water.[34]

Water Use in Agriculture

Water is an essential ingredient for agricultural production, whether for farm domestic use, livestock production, or plant growth. Most of agro-Manitoba receives enough precipitation most of the time to supply these needs, but the precipitation is variable (Case Study 3.2 on page 41) and measures are needed to augment natural supplies. The farm population has been declining since 1951, but this has been counterbalanced by increased per capita consumption. This, coupled with the consolidation of farms, has resulted in a larger demand at individual farmsteads, causing "more frequent shortfalls at these sites and a more severe problem for farmstead water supply."[35] "Most farm domestic water comes from ground water sources,"[36] with the Prairie Farm Rehabilitation Administration (PFRA) supplying funds for well-drilling for farm water supplies across the Prairies.[37] However, domestic farm use has never been a large proportion of total agricultural-water use.

Water for livestock is drawn largely from ground water,[38] but it is also supplied from dugouts, which in some places provide the main source of farm water supply. "In the past, [dugouts] were constructed solely as an emergency water supply for drought conditions,"[39] but today they are often relied upon

Table 18.1 Distribution of Irrigation Licences in Manitoba, 1989

Drainage Basin	Area (ha)
Assiniboine	6,030
Boyne	492
La Salle	293
Pembina	655
Red	1,679
Souris	1,662
Whitemud	1,300
Total Surface Water	12,111
Ground Water	6,272
Total	18,383

Source: A.M. Shady, ed., *Irrigation Drainage and Flood Control in Canada* (Ottawa: n.p., 1989), 235.

for a continuous water supply, and thousands of them dot the southern Manitoba landscape.

The PFRA is also heavily involved in the construction of small water-retention dams, usually listed as being for stock-watering purposes but in some cases also supplying domestic water. A recent inventory recorded that 479 such dams had been built in southern Manitoba since the PFRA was established in 1937.[40]

Irrigation, both in terms of area irrigated and the amount of water used, is minimal in Manitoba compared with Alberta and Saskatchewan, mainly because the need is less. There are no large irrigation schemes, and dams have not been built primarily for irrigation as in the other two Prairie provinces. Nevertheless, a series of dry years in the 1980s led to a substantial increase in the area irrigated (Table 18.1).

There were approximately 800 irrigators in Manitoba in 1989, and it is estimated that approximately 100 mcm of water are used for irrigation each year. "Crops under irrigation by large irrigators [irrigating between 32 and 300 hectares each] consist mainly of potatoes, corn and forage. . . . Small scale irrigators water anywhere from 2 to 20 hectares; they irrigate mainly for vegetables, strawberries and raspberries."[41]

Irrigation in Manitoba uses both ground and surface water. The principal aquifers used are the Assiniboine Delta Aquifer, the Oak Lake Aquifer, the Glenora Aquifer, and the Winkler Aquifer (Figure 18.3). In recent years, irrigation using the Assiniboine Delta Aquifer has increased, largely associated with the development of a potato-processing industry at Carberry.

"Until the mid 1970s the aquifer was used primarily for small town, domestic and farm water supplies. Over the past decade, however, ground water withdrawals for irrigation have risen to approximately 5,000 acre feet [6,167,000 m^3] per year."[42] This expansion has led to some friction between irrigators and non-irrigators, although it is claimed that at least three times the present 5,000 acres (2,023 ha) of irrigation could be undertaken without depleting the source.[43]

Water Use for Power

The force of running water has been used to drive sawmills and grist mills since the early days of European exploration of Canada. In Manitoba water mills were established first at the Red River Colony. "By 1870 many of the creeks that crossed the colony to one of the major rivers had been dammed, some of them at several places."[44] These mills suffered from the lack of relief in the area that prevented fast-flowing water. Elsewhere in the province, such as on the Shell at Asessippi (Case Study 7.2 on page 103) and on the Little Saskatchewan,[45] this was not a concern, but all encountered the problem that mill dams were frequently washed out in the spring.

Now water is used in Manitoba in two forms of electricity generation: thermal power and hydro power. Only approximately 2 percent of Manitoba's electricity is generated by thermal means at two peaking stations, located at Brandon on the Assiniboine and at Selkirk on the Red. The two rivers supply large quantities of water, mainly for condenser cooling, with small amounts being used for boiler feed and sanitation purposes within the stations. Most of the water is discharged to the original source but at a higher temperature — a form of pollution adversely affecting aquatic life. Water intake at Manitoba thermal stations in 1981 was 56 mcm, a minuscule amount compared with the 14,930 mcm withdrawn by thermal stations in Ontario.[46]

Most of Manitoba's electricity is hydro-generated, and the province has the potential to produce much more. It not only supplies its own needs but also exports to Saskatchewan, Ontario, and the United States.

Hydro development dates back to 1900, when the first station went into operation on — rather surprisingly — the Little Saskatchewan River, 2 km above its junction with the Assiniboine west of Brandon (Figure 18.5). The plant, which operated for only eight months of the year, supplied power to Brandon from 1900 to 1931.[47] The next developments were along the Winnipeg River, which traversed a series of rapids between the Ontario border and Lake Winnipeg (Figure 18.6). The Pinawa Plant, on the Pinawa branch of the river, opened in 1906. It was followed by a series of five other plants, so that by 1951 the full potential of the Winnipeg River was being used (Table 18.2).[48]

Attention then turned to the potential of Manitoba's northern rivers — the Saskatchewan at Grand Rapids; the Nelson, which drops 217 m from Lake Winnipeg to Hudson Bay; and the Churchill. However, the first hydro plants in the north were two small plants on the Laurie River, completed in 1952 and 1958 to supply mining operations at Lynn Lake. The Kelsey generating station, the first station on the Nelson River, was completed in

1961. It was also intended to supply electricity to the north, primarily for the developing industrial complex at Thompson. However, generation of power in the north for use in the south became possible because of the development at about this time of extra-high-voltage transmission techniques.[49] The Grand Rapids project, completed in 1968, was the first station in the north geared, at least in part, towards the southern industrial market (Figure 18.7).

Despite this new-found ability to transmit electricity over long distances, Manitoba Hydro, in studying the potential of the Nelson and the Churchill, decided that, rather than build plants on the Churchill, it would be better economically to divert some of the Churchill's flow to the Nelson (further south), increasing its flow and therefore its production at plants located along it. This diversion would be coupled with regulation of the level of Lake Winnipeg to ensure more constant flow along the Nelson.

The decision to divert the Churchill and to regulate Lake Winnipeg was, and still is, controversial in that little attention was paid to the environmental and sociological impacts of the project.[50] Despite strong opposition from several quarters, it was decided to proceed with the Churchill-Nelson Hydroelectric Development Scheme. By 1976 the control structure at Jenpeg (which also started generating electricity in 1979 using the first bulb-type turbines in North America) and the Churchill diversion project were in operation.

Three large generating stations downstream from the diversion — Kettle Rapids (opened in 1970), Long Spruce (1977), and Limestone (1990) — have since been constructed. A fourth — the Conawapa project — was undergoing an environmental review when Ontario Hydro decided not to purchase more electricity from Manitoba, making the project economically unviable. Even if the Conawapa project is eventually constructed, there will still be much hydro potential in Manitoba, some on the lower Nelson and some along the diversion route between the Churchill and the Nelson on the Burntwood River.

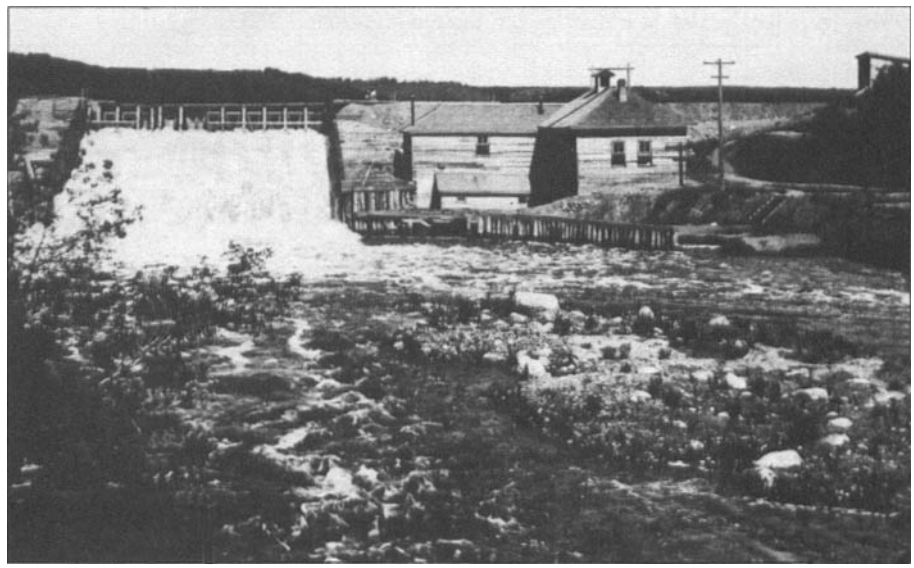

Figure 18.5 The First Hydro-electric Power Station in Manitoba, on the Little Saskatchewan River above its Junction with the Assiniboine. The station supplied electricity to Brandon during the summer months between 1900 and 1930 (Photograph: Manitoba Hydro / L.A. Stuckey collection)

Fishing

Fishing can be divided into two categories: commercial and sport. Commercial fishing in Manitoba's great lakes has a long history (Case Study 18.1 on page 281), and during 1980s it still provided an income and a way of life for over 3,500 people (Table 18.3). The total landed weight ranged from a low of 12,625,100 kg during the 1986–87 season to a high of 16,464,250 kg in 1980–81. The marketed value of the fish was much more variable than the landed weight, ranging from just over $13,374,850 to $28,255,000.

Lake Winnipeg is the largest commercial fishery in terms of employment, landed weight, and marketed value. "Fishing takes place in all seasons with each fisherman's catch governed by quotas set by the Fisheries Branch. Of the 15 kinds of fish harvested, whitefish, walleye, pike, sauger, perch, and lake trout are the most highly valued species."[51]

In the north, several lakes have commercial fisheries, although some of these have been declining. The best known is perhaps that on Southern Indian Lake, which has achieved prominence because of the adverse effects of the Churchill diversion.[52] Aboriginal people in the north have long relied on fish as an element of their diet, and although this has declined with the advent of western society and "imported" boxed and canned goods, subsistence fishing — as well as commercial fishing in some locations — is still important. In the case of subsistence fishing, no figures are available for the amount caught or its economic value.

Attempts at fish farming have been made in several parts of the province, with only limited success.[53]

"Manitoba recognizes two categories of sport anglers: resident and commercial. About 80 percent of fishermen are resident anglers who live in Manitoba and other parts of Canada, and who qualify for 'resident licenses.' Commercial anglers are those who live outside Canada or who use commercial facilities such as sport fishing lodges."[54]

Figures for the value of fish caught do not indicate the value of sport fishing; usually the sport is assigned a value based on the revenue it generates. For example, in the 1990–91 season, 176,004 licenses were issued, generating an income of $1,633,732.50 for the province. In 1985 sport fishermen spent $159 million. Of this, $85 million was used for food, lodging, and transportation, while the remaining $74 million was spent on major

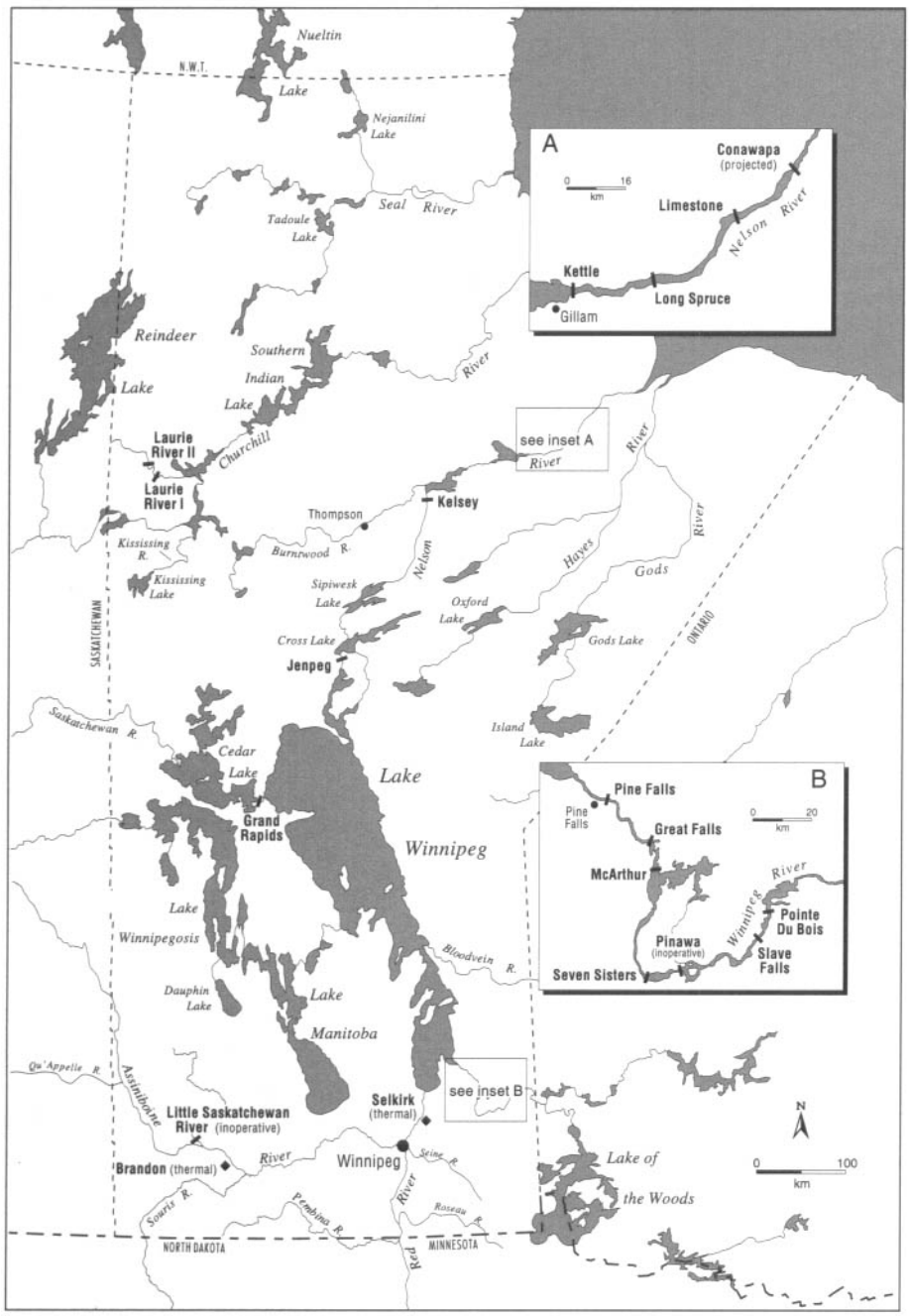

Figure 18.6 Power Stations in Manitoba

purchases such as boats, vehicles, and camping equipment.[55]

In 1989, 121 lodges and 42 outfitters catered to sport fishers in Manitoba.[56] While the expensive tourist operations in the north and east attract most attention, the largest single sport fishery in Manitoba is the Red River, and many of the small rivers and lakes of the south have their own dedicated clientele.

Recreational Water Use

Bodies of water are important for recreation in the province, especially in areas where they are relatively scarce. Cool water and the availability of water-related activities are particularly attractive during a hot prairie summer. Both instream and land-based activities can be adversely affected by variations in quantity and quality of the water, so planners increasingly have to consider recreation when devising water-resource projects.

Although it is now much out of date, a study published in 1982 gives some idea of the importance of water recreation in the province. It concentrated on recreational sites and the activities occurring at them. Sites were considered to be water-based if there was participation in any of the following primary activities: swimming, scuba or skin diving, water-skiing, power-boating or rowing, sailing, canoeing, fishing from a boat, angling, ice fishing, waterfowl hunting, camping at a body of water, or visiting cottages. Secondary activities included picnicking, nature interpretation, hiking, skating, and other activities that could be enhanced by the presence of a body of water but that were not water-based.

Sites were divided into two categories: cottage sites, including groups of cottages or cottage subdivisions; and non-cottage sites, including all other activity areas at bodies of water.[57] Cottage sites are usually privately owned, whereas non-cottage sites are public. In 1979 the part of Manitoba lying within the Saskatchewan-Nelson drainage basin (most of the province) had 765 water-based recreational sites, 75 percent of them non-cottage sites.[58]

Fishing was the most popular activity, followed by canoeing, motorboating and rowing, and camping. None of these activities is limited to the sites surveyed; in particular, fishing and canoeing are found throughout the province. The province publishes a map of 13 canoe routes, with a brochure and a detailed map of each route. Most routes are located in the Shield country of eastern and northern Manitoba.[59]

The Canadian Heritage River System is a cooperative program of the federal government and eight provinces, including Manitoba. Its objectives are to give national recognition to the important rivers of Canada and to ensure long-term management to conserve their natural, historical, and recreational values for the benefit of Canadians. Three Manitoba rivers are part of the system: the Seal and the Hayes, both of which flow to Hudson Bay, and the Bloodvein, which flows to the east side of Lake Winnipeg[60] (Figure 18.2).

SOME WATER-RELATED PROBLEMS

Drainage

A 1:50,000 scale map of parts of the Red River Plain shows a dense network of straight channels of human origin. These are part of an artificial drainage system that has evolved over the past 100 years, the main purpose of which is to remove excess water from the land and thereby increase or sustain its agricultural productivity.

But the Red River Plain is not the only area of poor surface drainage; the problem affects the whole of the Manitoba Lowlands, which have an almost imperceptible slope and an almost impervious subsoil because of glaciolacustrine deposition into glacial Lake Agassiz (Chapter 2). Also, water drains into the area from the Manitoba Escarpment and to a lesser extent from the high land to the southeast. The runoff from the Manitoba Escarpment, called "foreign water" by residents, causes problems during the spring melt.

A more serious problem is the occurrence of flash floods during the summer, which inundate areas at the base of the escarpment as well as deposit shale eroded from the steep-sided valleys of the eastward-flowing streams.[61] A contributing factor has been the clearing of forested slopes, resulting in increased runoff and erosion. One of the most seriously affected areas was the Whitemud drainage basin, but in recent years the trend has been reversed by concentrated conservation efforts.[62]

The problem of excess water in parts of the Manitoba Lowlands "was overcome to a large extent by the construction of drains, dikes, and channels." These "were successful in bringing some 800,000 hectares of inherently wet but fertile land under cultivation between 1895, when the Land Drainage Act was passed, and 1930." But they "were expensive to construct and maintain, and subsequently there was widespread discontent over the apportionment of costs."[63] Particularly problematic was the question of "foreign water." Eventually, un-

Table 18.2 Hydro-electric Power Stations in Manitoba

Name	Location	Date Opened (O) or Completed (C)	Capacity (kw)	Comments
Little Saskatchewan River	Little Saskatchewan River	1900 (O)		Served Brandon until 1931
Pinawa	Winnipeg River	1906 (O)		Closed 1951
Pointe du Bois	Winnipeg River	1911 (O)	72,000	
Great Falls	Winnipeg River	1928 (C)	132,000	Revitalized 1979
Slave Falls	Winnipeg River	1931(O)	68,000	
Seven Sisters	Winnipeg River	1931 (C) 1st stage 1952 (C) 2nd stage	150,000	Dam reconstructed 1979
Pine Falls	Winnipeg River	1952 (C)	82,000	
McArthur	Winnipeg River	1955 (C)	56,000	
Laurie River I	Laurie River	1952 (C) 1st stage 1970 (C) 2nd stage	5,000	
Laurie River II	Laurie River	1958 (C)	5,000	
Kelsey	Nelson River	1961 (C) 1st stage 1972 (C) 2nd stage	224,000	
Grand Rapids	Saskatchewan River	1968 (C)	472,000	
Kettle	Nelson River	1974 (C)	1,272,000	
Long Spruce	Nelson River	1979 (C)	980,000	
Jenpeg	Upper Nelson River	1979 (C)	126,000	
Limestone	Nelson River	1992 (C)	1,330,000	
Conawapa	Nelson River	?	1,390,000	Abandoned indefinitely in 1993

Source: Information principally derived from Manitoba Hydro, *A History of Hydro-Electric Power in Manitoba* (Winnipeg: Manitoba Hydro, 1986), and Manitoba Hydro, *The Hydro Province* (Winnipeg: Manitoba Hydro, 1993).

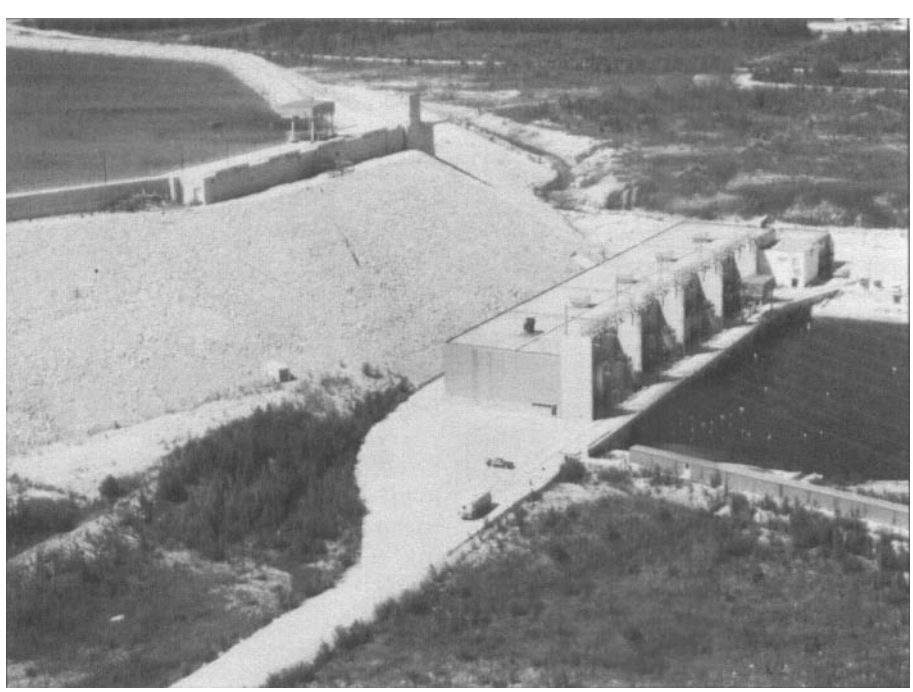

Figure 18.7 Hydro-electric Power Station at Grand Rapids, on the Saskatchewan River West of Lake Winnipeg. This was the first hydro station in "northern" Manitoba and, with a fall of 36.5 m, has the greatest head of any Manitoba station. (Photograph: Manitoba Hydro)

Table 18.3 Commercial Fishing in Manitoba

	Lake Winnipeg		Manitoba Total		
	Weight (kg)	$ Value	Weight (kg)	$ Value	
Year					Total Employment
1980–81	5,652,800	9,066,800	16,446,250	18,635,900	3,659
1981–82	5,929,100	9,935,800	14,648,500	18,518,150	3,767
1982–83	5,446,900	6,963,800	15,467,800	13,374,850	3,826
1983–84	5,502,100	8,871,650	13,205,350	16,377,550	3,737
1984–85	5,950,100	9,870,550	13,750,300	18,984,150	3,811
1985–86	5,521,500	10,304,350	12,829,800	17,869,100	3,660
1986–87	5,559,000	14,191,950	12,625,100	24,896,250	3,609
1987–88	5,879,800	15,545,700	13,059,150	28,255,600	3,594
1988–89	6,099,750	11,936,700	13,783,800	23,559,300	3,638
1989–90	5,917,250	9,636,500	13,511,750	18,134,850	3,689

Source: Manitoba, Department of Natural Resources, *Annual Report 1990–91* (Winnipeg: Department of Natural Resources, 1991), 34.

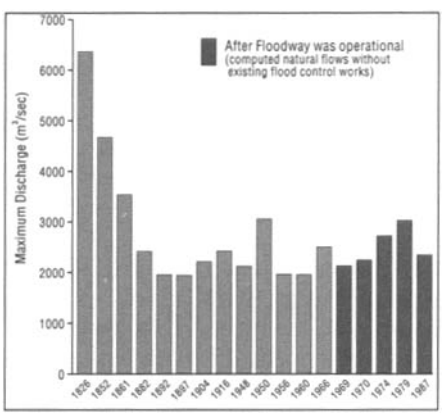

Figure 18.8 Years of Major Floods in Winnipeg (Source: From data in J. Andrews, ed., Flooding *[Ottawa: Environment Canada, 1993], 59)*

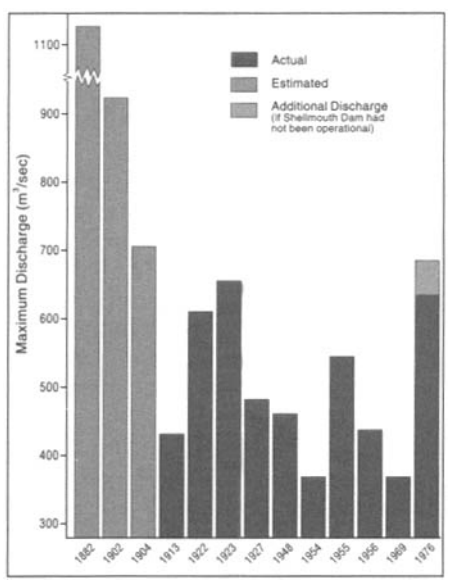

Figure 18.9 Years of Major Floods in Brandon (Source: Environment Canada and Manitoba Department of Natural Resources, Reducing Flood Damage in Brandon *[Regina and Winnipeg: Environment Canada and Manitoba Department of Natural Resources, 1982], 4)*

der an amendment to the Land Drainage Arrangement Act (1952) "the province was to assume two thirds of the cost of the construction and maintenance of drains carrying 'foreign water' and one third of the cost of construction and maintenance of drains intercepting and carrying local water, originating in the drainage district. The amendments also provided for the province to assume 100 percent of the cost of reconstructing major floodways carrying 'foreign water' through the drainage districts of the Red River Valley."[64]

"In 1966 the province instituted the Provincial Waterway System whereby all construction and maintenance costs of designated waterways were assumed by the province; all other costs were to be borne by the rural municipalities."[65] The situation is still not optimal, although "at present 24,700 kilometres of artificial drains and 15,800 kilometres of natural channels are maintained as part of the drainage systems in the province. About 4,400 of the 24,700 kilometres of artificial drains are designated as Provincial Waterways and are under the jurisdiction of the province."[66]

Part of the problem is that municipalities cut across drainage basins. In response, the provincial government has been trying to organize watershed conservation districts, of which there were six in 1991 (Alonsa, Cooks Creek, Pembina Valley, Turtle Mountain, Turtle River, and Whitemud).[67]

Floods and Flood Control

Causes of Floods

Flooding is a severe problem in southern Manitoba, but the problem is not new. Winnipeg experienced floods in 1826, 1852, and 1861, before European settlement was widespread[68] (Figure 18.8), and Brandon's predecessor, Grand Valley, located 3 km east of the present city, was inundated in 1881[69] and 1882[70] (Figure 18.9).

A combination of meteorological, catchment, and human factors produce the flood problem. Although precipitation totals for Manitoba are low, much of the precipitation falls as snow, and when it melts — especially if quickly accompanied by rain, as in the Red River Valley in 1950 — large quantities of runoff feed rapidly into river channels. In addition, the soil is frozen following the severe winter, hindering infiltration of both precipitation and runoff.

Many of the flood-prone settlements are located on extremely flat land on the floor of former glacial lakes (for example, all the settlements of the Red River Plain are on the floor of Lake Agassiz, Melita is on the floor of Lake Souris, and Souris on the floor of Lake Hind) or on the floor of a glacial-lake spillway (such as Brandon and La Rivière). A contributing factor in the case of the Red River is the fact that, as it flows north, upper reaches become ice-free before lower reaches, where a barrier is created.

The effects of human activities on both the frequency and the severity of floods is debatable. It would seem likely that the clearing of natural vegetation for agriculture, the drainage of sloughs, and the construction of drainage channels would increase runoff and cause rapid transmission of water to larger streams, and hence floods. However, there is little documentary evidence to substantiate this idea.

Flood Mitigation

Minor flood-control projects — small dams, dikes, and so on — have existed since humans first built permanent settlements in flood-prone areas. However, the first large-scale flood-control projects in the province were undertaken only after the massive 1950 Winnipeg flood, which flooded about 20 percent of the city of Winnipeg, causing damages estimated at $125.5 million in 1957 dollars ($553.5 million in 1991 dollars) and the evacuation of approximately 60,000 people.[71] A provincial Royal Commission appointed in 1956 to analyse various protection schemes recommended three projects in its 1958 report: a floodway around Winnipeg, a diversion from the Assiniboine River above Portage la Prairie to Lake Manitoba, and a dam at Shellmouth on the Assiniboine River west of Russell (Case Study 18.2 on page 283).

Brandon has been affected by floods in 30 years of its 110-year history, but severe floods have been less frequent (Figure 18.9). The only ones since the completion of the Shellmouth Dam occurred in 1976 and 1995. "Without the operation of the Shellmouth Reservoir, the 1976 peak discharge in Brandon would have exceeded that of 1923."[72]

Additional protection is provided at Brandon by three dikes built to protect commercial property on the Assiniboine floodplain, a residential development in the northeastern part of the city, and part of the city's golf course, although the last of these was overtopped during the 1995 flood. On the Red River Plain, eight small communities are protected by ring dikes built almost entirely around the settlements (Case Study 18.2).

Flooding is caused not only by rivers but also by lakes. For example, under natural conditions Lake Manitoba water levels fluctuated between a low of 809.3 feet (246.7 m) in 1942 and a high of 816.3 feet (248.8 m) in 1955. At the higher levels, "large tracts of land were flooded with meadows and pasture land reverting to marsh."[73]

A project to regulate the water level between 811 feet (247.2 m) and 813 feet (247.8 m) was completed in 1961. The Fairford Dam on the Fairford River, between Lake Manitoba and Lake St. Martin, controls the flow of water from Lake Manitoba to Lake Winnipeg. Similarly, the control structure at Jenpeg, on the Nelson River, limits the level of Lake Winnipeg to a range of 711–715 feet (216.7–217.9 m). Before regulation it varied by 10 feet (3 m); since regulation began in July 1976, levels have remained in the range of 4 feet (1.2 m). Although the regulation is designed principally to ensure regular flow through the hydro stations on the Nelson River, it is claimed that it benefits navigation, property owners, and recreational users.[74]

There is growing recognition that massive structural methods are a costly and sometimes ineffective method of dealing with floods. The Canada-Manitoba Flood Damage Reduction Program, a joint agreement between the federal government and the province, recognizes this and seeks to reduce flood damage by other means.[75]

The approach is to identify flood-risk areas and to discourage flood-vulnerable development within those areas. Where existing development warrants, remedial measures are considered, such as ring dikes around the Red River Plain communities. Detailed maps are drawn on which a floodway (the area most prone to flooding) and a floodway fringe (where flooding is less likely) are indicated.

WATER-RESOURCE STUDIES

The water resources of Manitoba have been the subject of a large number of studies, and because most of Manitoba's major rivers start in some other jurisdiction and flow into the province, the studies have been international and interprovincial as well as national and provincial in scope.

Several studies have resulted from "applications" or "references" to the International Joint Commission (IJC). This is a joint organization of Canada and the United States dating from 1906. Each country appoints three commissioners, and each has a co-chairperson. The IJC scrutinizes projects that have an effect or a potential effect on international rivers (rivers that flow across the border) and boundary waters (lakes and rivers along which the boundary lies).

In the case of an application, the developer (state, province, municipality, or individual) asks for permission from the IJC to proceed; in the case of a reference, there is a dispute between Canada and the United States, and the IJC is asked for a judgement, which the two countries then usually accept (Table 18.4).

The Roseau, Pembina, Red, and Souris have all been the subject of investigations by the IJC. One of the best known was the reference by Canada concerning the construction of the Garrison Diversion Unit, a huge multipurpose water-resource scheme in North Dakota. Canada was concerned that the project in its original form would have adverse impacts on both the quantity and quality of water flowing to the Souris and the Red, and that fishing, particularly in the Manitoba Great Lakes, would be adversely affected. The issue was referred to the IJC, which, in its report in 1977, concluded that the project would have detrimental effects in Canada and recommended that "those portions of the Garrison Diversion Unit which could affect waters flowing into Canada not be built at this time."[76]

Despite its small size, the Souris is a much-studied river. Quite separate from the deliberations of the IJC, in 1978 the Souris River Study Board — a joint organization of Canada, Manitoba, and Saskatchewan — reported on water use within the Canadian part of the river basin.[77] More recently, controversy, principally involving the federal government and the government of Saskatchewan, has arisen over the building of two dams in Saskatchewan: one on the upper reaches of the Souris (the Rafferty Dam) and the other on Moose Mountain Creek, a tributary of the Souris (the Alameda Dam).[78]

Following a decision by the Federal Court of Canada directing the federal Minister of the Environ-

Table 18.4 Some Applications and References to the International Joint Commission Relating to Manitoba

Date	Application (A) or Reference (R)	Title	Action
1912	R	Lake of the Woods levels.	Completed. Resulted in the 1925 convention.
1913	A	Greater Winnipeg Water District — 100 million gallons per day from Shoal Lake for Winnipeg water supply.	Approved. No board
1929	R	Roseau River drainage.	Completed.
1939	R	Souris River apportionment.	Governments approved interim measures recommended by the IJC.
1944	A	Ontario and Minnesota Pulp and Paper Company — Ash Rapids Dam in Lake of the Woods.	Approved but not built.
1948	R	Souris and Red Rivers — further uses and apportionment of water.	Completed. International Souris-Red Rivers Engineering Board still reports on its ongoing activities.
1959	R	Rainy River and Lake of the Woods pollution.	Completed. Rainy River still under active surveillance by the International Rainy River Water Pollution Board.
1962	R	Pembina River — cooperative development of water resources.	Completed. Recommendations not acted upon
1964	R	Red River pollution.	Completed. Active surveillance by the International Red River Pollution Board.
1969	A	Metropolitan Corporation of Great Winnipeg — additional diversion from Shoal Lake.	IJC action deferred at applicant's request.
1975	R	Garrison Diversion project.	Completed. Recommended against elements of the project that would affect return flows to Canada.

Source: International Joint Commission, *International Joint Commission Activities 1987–1988* (Ottawa and Washington, DC: International Joint Commission, n.d.), 32–42.

ment to apply the existing federal Environmental Assessment and Review Process to the project, an initial environmental evaluation was conducted, and a report in three volumes was published in 1989.[79] Although the Souris flows many miles from Saskatchewan to Manitoba, via North Dakota, projects in Saskatchewan can clearly influence the flow of the river in Manitoba.

The Qu'Appelle, another small Prairie river, flows across southern Saskatchewan, where it is an important element of a semiarid region, and enters the Assiniboine at St. Lazare (Figure 18.2). Although less than 15 km of the river is in Manitoba, developments along it are of interest to Manitoba because it enters the Assiniboine below the Shellmouth Dam. Flow along the Qu'Appelle in Saskatchewan has effects downstream in Brandon, Portage la Prairie, and Winnipeg. For example, the joining of the Assiniboine and the Qu'Appelle resulted in severe flooding at St. Lazare in 1995. Thus the Qu'Appelle Basin Study Board included representatives from the federal government and both Saskatchewan and Manitoba. Its report, with 64 recommendations, was published in 1972.[80]

One of the earliest studies was the large *Saskatchewan-Nelson Drainage Basin Study* in 1972, a joint venture between the three Prairie provinces and the federal government.[81] The report included details of all dams and diversions in the Prairie provinces that were considered feasible from an engineering point of view.

Another massive study was the *Lake Winnipeg, Churchill and Nelson Rivers Study Board Report* (1975).[82]

Following the decision by the government of Manitoba to authorize the Nelson River hydroelectric development program, attention focused upon the major changes that could be expected to affect all direct and indirect users of these waters. Consequently, in August 1971, the federal and provincial governments entered into an Agreement to undertake a comprehensive study of the effects of the regulation of Lake Winnipeg, diversion from Churchill River and the development of the hydroelectric potential of the Diversion Route.[83]

This eventually resulted in a technical report with 11 appendices. Unfortunately the report came after the fact: the decision to proceed with the Nelson River hydroelectric development had already been made, no matter what the study concluded. Nevertheless, it contains a wealth of information about water and related resources in the Churchill and Nelson basins of northern Manitoba.

Besides these major studies, there are several studies of more local interest. The Whitemud River Watershed,[84] Dauphin Lake,[85] Oak Lake and Plum Lakes,[86] the Assiniboine–South Hespeler area,[87] and a water-supply strategy for the Pembina Valley[88] have been the subject of studies, all of which contain useful information on the water

resources of the areas concerned. At the time of writing, the Assiniboine Basin Study Board was preparing a report on water use within the Manitoba part of the basin.

WATER LEGISLATION

Manitoba's downstream location means that it is not "master of its own house" as far as river flow is concerned. Few if any of the major rivers entering the province do not have some form of water-control structure along their courses before entering the province. Consequently both the quantity and quality of river flow in Manitoba are governed by several national and international laws, without which the province would be in dire straits.

At the international level, the 1909 Boundary Waters Treaty is the major piece of legislation. Besides considering applications and references, the IJC, which was set up as part of this treaty, "often has ongoing responsibilities with respect to applications by monitoring compliance with the terms and conditions set forth in its Orders of Approval which follow from applications."[89] For example, an engineering board checks on both the quantity and quality of Souris River water crossing the border. Since the first reference in 1912, 11 applications and references have had some influence on Manitoba (Table 18.4).

The principal agreement governing the amount of water flowing to Manitoba from the west is the Prairie Provinces Water Apportionment Agreement, which dates from 1969 and provides for the equitable apportionment of all eastward-flowing rivers among the Prairie provinces. This and subsidiary agreements ensure that 50 percent of the flow of rivers in Saskatchewan is passed on to Manitoba. On the whole, the agreement has worked well, although there have been complaints about the limited flow of some small rivers entering southwestern Manitoba from Saskatchewan.

On the other side of the province, the Lake of the Woods Control Board (LWCB), a purely Canadian board, has been managing water levels and flows in the Winnipeg River Basin for over 70 years.[90] However, as Lake of the Woods is a boundary water, a Canada–United States treaty signed in 1925 created the International Lake of the Woods Control Board (ILWCB). Lake of the Woods is normally regulated by the LWCB, but the outflow from it is subject to the approval of the ILWCB in extreme conditions.

Although not concerned exclusively with water resources, the Prairie Farm Rehabilitation Act of 1935 has had a major impact on the management of Manitoba's water resources. Over the years the Prairie Farm Rehabilitation Administration has played a key role in a number of major water-related projects, including seven major dams.[91] It has also been involved with the construction of thousands of dugouts, wells, and small dams throughout southern Manitoba.[92]

THE FUTURE

If predictions of increasing dryness on the Prairies are correct, pressure on Manitoba's water resources can be expected to increase. Water supply for municipal, industrial, and agricultural use will be stressed. In particular, the concentration of population and associated industry in a few urban centres will increase the strain on the resource for municipal and industrial use. Communities and groups without an adequate assured source of water will be at a disadvantage. This was the basis of the desire to divert water from the Assiniboine aquifer north to the Westlake region,[93] the controversial plan to divert water south from the Assiniboine to the Morden-Winkler area, and the request by the town of Souris to extract water from the Oak Lake aquifer rather than rely on the Souris River as a source.

Water pollution does not reduce the amount of water available, but it restricts use or increases the cost of use. The treatment of sewage discharges into the rivers of Manitoba has not reached a high level of efficiency,[94] and the low flow of many Manitoba rivers, coupled with their variability, makes them unsuitable for dilution of large quantities of sewage. Although the cost of complete sewage treatment is large,[95] the cost of nontreatment is probably larger. Pressure on the supply of water reaching the province from the west and south will increase as it is used more and becomes more polluted.

The province is committed to hydro development in the north. Even though the Conawapa project has been shelved, it will probably be completed sometime in the future. Most of the environmental damage has been done with the creation of the Churchill diversion, so the main obstacle is economics — whether there will be a market for the electricity in Ontario or the United States. The after-effects of the Churchill diversion are likely to remain for a long time. The Northern Flood Agreement of 1977 has not been completely settled,[96] and it has been suggested that the town of Churchill might petition the government for lost revenue resulting from reduced flow along the Churchill River.

Fortunately, some of the painful lessons of the Churchill diversion have been learned. The Federal Environmental Assessment and Review Process should safeguard against hasty and unwise development, as the process applies to proposals "that are to be undertaken directly by the government; to which the government makes a financial commitment; that are located on federally administered land, including offshore; that may have an environmental effect on an area of federal responsibility."[97] It is hard to imagine a water development of any size that does not fall under one of these categories. Hopefully the federal government will have the political will to ensure that the necessary reviews are carried out.

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39. See PFRA, *Dugouts for Farm Water Supplies* (Winnipeg: PFRA, n.d.), 1.
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Case Study 18.1
Fish on the Prairies?
A Colonial Resource Economy

Frank J. Tough

Freshwater fish are a significant natural resource for Manitoba.[1] Aboriginal people, fur trade employees, and many early settlers relied upon the food fisheries. Until a hundred years ago, sturgeon and goldeye could be easily caught at The Forks of the Red and Assiniboine rivers.

The economic geography of Manitoba fisheries follows a pattern of development similar to other Canadian resource industries: communities were established for the production and export of a staple; foreign ownership and external markets created a highly unequal distribution of the benefits between fishermen and buyers; resource-management problems were common; and after the heyday of economic growth, the government assumed responsibility for trying to maintain employment in a declining industry.

Lake Winnipeg was the largest fishery, and it was here that many fishing communities and fishing stations developed (Figure 18.1.1). Commercial fishing for an export market began in the 1880s on Lakes Winnipeg and Manitoba. By 1898 the Lake Winnipegosis whitefish fishery was being intensively exploited, and it was eventually depleted. Figure 18.1.1 shows the plans to protect the Lake Winnipeg fishery that were suggested after only a few years of commercial fishing.[2]

Driven by the high value of sturgeon and caviar, commercial fishing spread up the Saskatchewan River and down the Nelson River after 1900. The demise of sturgeon, a very important resource for Aboriginal people, contributed to Aboriginal economic hardship in the post–fur trade era. Government efforts to protect this fishery were an utter failure. By the 1920s, the remaining sturgeon fisheries, on the remote Hayes, Fox, and Churchill rivers, had been found and exploited. The use of airplanes permitted any lake in northern Manitoba with a sizable

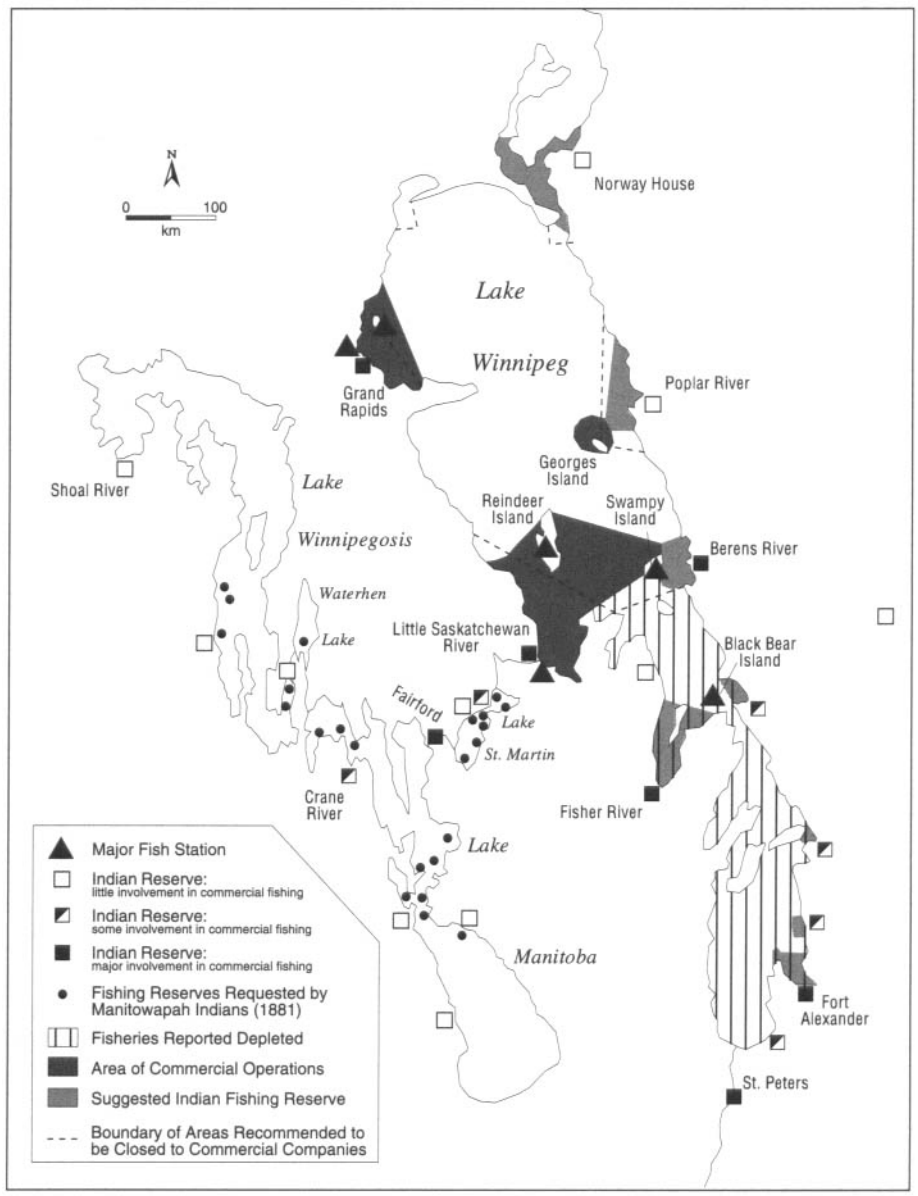

Figure 18.1.1 Early Fisheries on Manitoba Lakes

fishery to be exploited, if only for a few seasons.

For many decades gill nets, sailboats, and steam tugs (Figure 18.1.2) were the main means of harvesting, but during the 1930s steam and sail were replaced by gas boats. Winter fishing was also quite feasible, and better prices were obtained in this season. The ice jigger allowed fishermen to set nets under the ice efficiently, and special horse trains, involving many adaptations to the environment (snowploughs, sledges), permitted fishermen to transport winter-caught fish (Figure 18.1.3). Even distant fisheries, 240 km from the railhead, could be exploited.

The industry began with a rapid commercialization that eroded and threatened Aboriginal subsistence fisheries.[3] Treaties between Indian bands and the Crown failed to anticipate the loss of this resource. While Icelanders have been associated with this primary industry, Aboriginal labour was always required to open up a commercial-fishing frontier.

In order to move fresh fish from the north end of Lake Winnipeg, large investments in steamboats and freezer plants were required. By the turn of the century, a monopoly had

consolidated the industry. The activities of local interests, fronting for the Booth Fish Company of Chicago, caused smaller firms and independent fishermen to be marginalized. During the Depression, New York fish buyers formed a combine, so the economic hardships of the time were borne directly by the fishermen.

Although fishermen fished as "independent" commodity producers, most required financing at the start of each season; because prices were kept low, fishermen often remained in debt to the fish companies. Again in the 1950s, declining yields and debt peonage adversely affected the livelihood of fishermen.

American ownership of the industry and the unequal trade resulting from dependence on external markets meant that fishermen had low incomes. Five major government investigations (1890, 1909, 1933, 1954, 1965) reflect periodic crises in the development of the industry. Ultimately the government's inability to manage this resource for the benefit of the province and the fishermen stemmed from an unwillingness to alter the structure of the industry.

Not until the creation of the Freshwater Fisheries Marketing Corporation (FFMC), a federal Crown corporation with the right to buy and export fish, did any progressive change to the structure of the industry occur. The FFMC was designed to strengthen, through a monopoly, the position of fishermen with respect to export prices. Although there were many start-up problems, since its inception in 1969 the FFMC has helped sustain a declining industry. Because fishermen receive a larger share of the market price of the fish than when dealing with private buyers, and because the FFMC helps with input costs, some positive redistribution of income has occurred.

While a desire to change the marketing structure had existed for decades, public-sector involvement came only after the most productive fisheries had been overexploited. The spread between the consumer's price for fish and the price paid to fishermen has increased in recent years. Also the centralizing role of the FFMC has tended to restrict lakeside processing and stifle local marketing of freshwater fish.

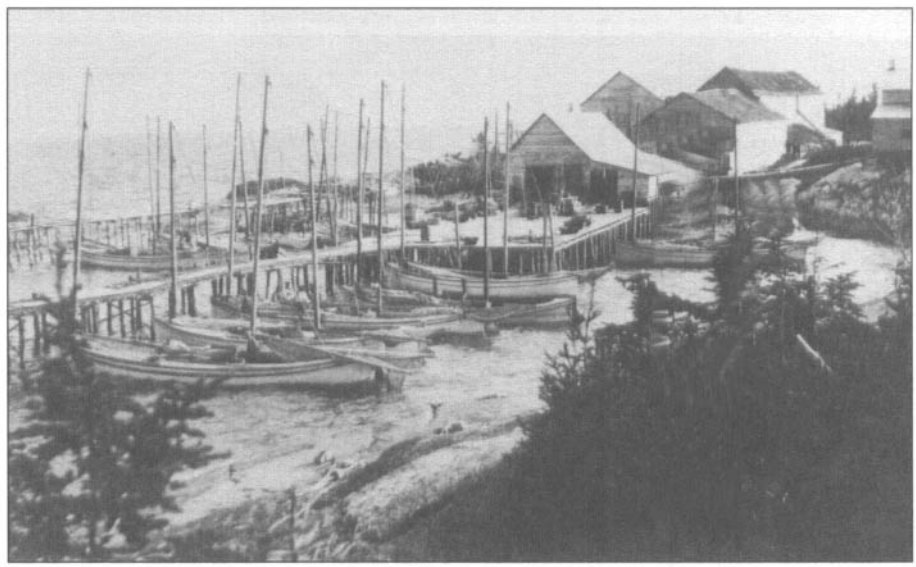

Figure 18.1.2 Fishing Station and Sail Boats on Lake Winnipegosis about 1920 (Photograph: PAM, Collection: transportation-boat-20)

Figure 18.1.3 Freight Gang Hauling Fish to Riverton, 1920 (Photograph: PAM, Collection: Manitoba Natural Resources Series 11-130)

Until the 1940s government conservation efforts were relatively straightforward. Early methods for controlling production and sustaining yields included closed seasons to protect each species during spawning times, restrictions on mesh size and the length of gill nets, and lake limits. Resource management was largely an effort to match production to the disorderly and chaotic external markets.

While the market was initially interested in whitefish and sturgeon, eventually every major species was commercialized. In fact, the industry sustained itself by harvesting a series of species. For most species, production figures display a single marked peak followed by a decline.

Taken as a whole, the province's historical production of the major species peaked in the following sequence: sturgeon (1900), whitefish (1904), northern pike (1910), goldeye (1926), tullibee (1927), perch (1940), sauger (1941), and pickerel (1951). Recently new peaks have been set for whitefish (1980),

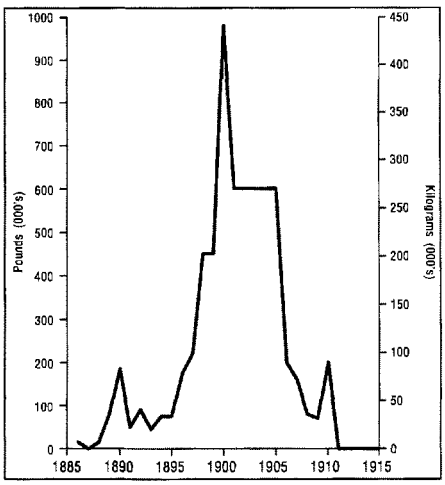

Figure 18.1.4 Sturgeon Catch for Manitoba, 1895–1915

northern pike (1982), and perch (1989). The sturgeon fishery was the most overexploited and has not recovered (Figure 18.1.4). For the long term, the pickerel fishery of Lake Winnipegosis and the whitefish fishery of Lake Winnipeg, both supported by hatchery programs, have relatively stable yields.

In the post–fur trade era, a commercial fishery developed along the lines of a classic Canadian staple industry.[4] In fact, Manitoba's commercial-fishing industry was the first major enterprise in the Prairies to be taken over by American capital. The industry catered to the external market and became extremely dependent on it; in the process the local market was destroyed.

In the early years, government agencies chose not to restrict the pace of commercialization or to regulate foreign ownership. Later, however, state involvement increased in order to sustain fishing communities. In the long term, a historical geography of this colonial economy demonstrates that the techniques of fisheries management and the approaches of resource geography are really subordinate to the problems of foreign ownership and the constraints of producing for an external market.

NOTES

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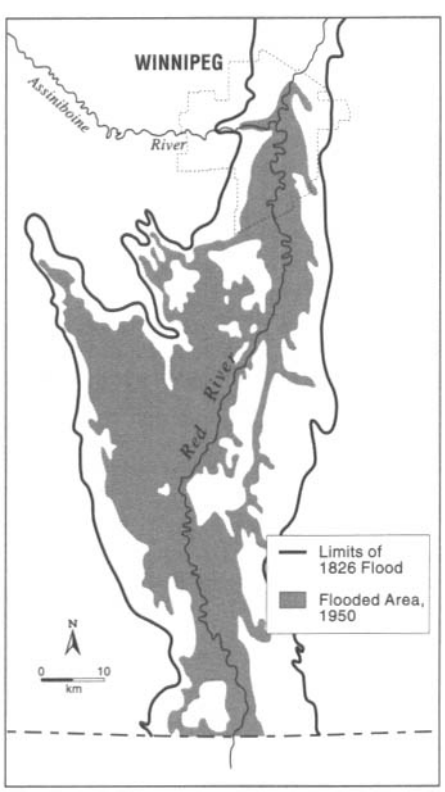

Figure 18.2.1 Extent of Red River Flooding in 1826 and 1950 (Source: Royal Commission, 1958)

Case Study 18.2
Flooding and Flood Protection on the Red River Plain

W.F. Rannie

From the beginning of written records, flooding has been a major hazard for the occupants of the Red River Valley. Accounts from the Red River Settlement period describe numerous floods, and those of 1826, 1852, and 1861 exceeded any that have occurred since (Figure 18.8). Ironically, however, because most of Manitoba's population growth occurred during a long period of little flooding, by 1950 few people were aware of the potential threat. That spring, one of the greatest natural disasters in Canadian history provided an overdue reminder and became a milestone in Winnipeg's history.

In that flood, almost 1,700 km² along the river were inundated and all towns were evacuated (Figure 18.2.1). In Winnipeg, 10,500 homes were flooded and more than 100,000 people relocated, despite the seven-week diking operation by thousands of military and civilian personnel. Had the water level risen by another 0.4 m, the entire population of 350,000 would have faced evacuation. Direct costs of flood fighting and damage claims were about $30 million, and true costs may have exceeded $100 million.

Immediately following the 1950 disaster, federal and provincial agencies began studying the history and causes of flooding and possible ways to reduce the hazard. In 1956 a provincial Royal Commission was appointed to determine the most effective combination of measures to combat floods. Its report, issued in 1958, became the basis for the most ambitious flood damage–reduction program in Canada.

At the heart of the protection system are three major structural elements (Figure 18.2.2). The largest is the Red River Floodway, a 47 km excavated channel that can divert up to 1,700 cubic metres per second (cms) around the city. (The peak flow of the 1950 flood was 2,930 cms at Winnipeg.) A second channel, the Assiniboine Diversion 3 km west of Portage la Prairie, can divert up to 700 cms from the Assiniboine River to

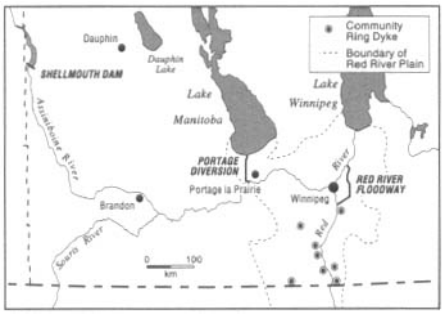

Figure 18.2.2 Flood Control Structures in Southern Manitoba

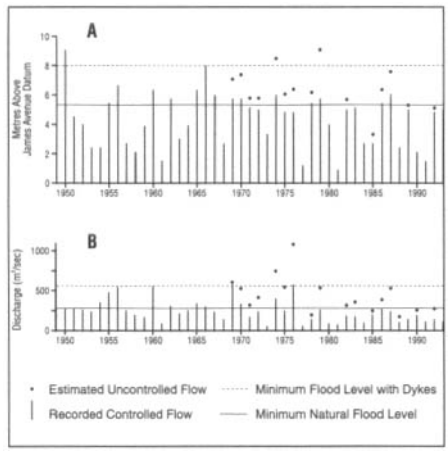

Figure 18.2.3 Annual Peak Water Level of the Red River at Winnipeg (A), and Annual Peak Discharge of the Assiniboine River at Headingley (B), 1950–93

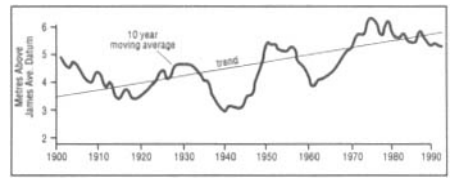

Figure 18.2.4 Water-level Trend, Red River at Winnipeg, 1900–90

Lake Manitoba, relieving stress on the Red River through Winnipeg and providing protection along the lower Assiniboine. Finally, the Shellmouth Dam and reservoir on the upper Assiniboine offer protection to Brandon, further control the amount of water in the lower Assiniboine, and provide a supply of water to maintain flow in dry years.

The other elements protect property by controlling the spread of flood water from the Red. In Winnipeg, much of the diking system from the 1950 flood was made permanent and new dikes were built, to a total length of nearly 100 km. All these measures combined to protect Winnipeg from discharges up to 4,800 cms, a flow almost 70 percent larger than the peak discharge recorded in 1950, with a return period of about 230 years.

In the Red River Valley, where comprehensive diking along the river was impractical, ring dikes were constructed around eight communities (Brunkild, Dominion City, Emerson, Letellier, Morris, St. Adolphe, St. Jean Baptiste, and Rosenort), protecting them against floods up to the 1950 level (with a return period of about 45 years). As a measure of the magnitude of the project, the cost of these elements ($103 million) was about 40 percent more than the total revenues of the provincial government when the Royal Commission reported in 1958. Thus, even though about 55 percent of the costs were borne by the federal government, the decision to proceed placed a considerable burden on the people of Manitoba.

The main elements of the program were completed between 1968 and 1972, and almost immediately began to repay the investment. From 1969 to 1979, mean annual maximum discharge of the Red River was 80 percent higher than the 1913–68 average, and without the control structures the water level in Winnipeg would have exceeded minimum natural flood state in 9 of the 11 years (Figure 18.2.3). In 1974 and 1979, flows approaching that of 1950 were recorded, and the entire cost of the projects was more than recovered in reduced flood-fighting costs and damage claims.

The Assiniboine Diversion was even more critically tested in 1974 and 1976, when flows were 140 percent and 230 percent higher than the maximum recorded since records began in 1913. As with the Red River, damage from these floods would have exceeded the total cost of the Assiniboine elements of the program.

The 1979 flood on the Red River demonstrated the need for a more comprehensive program in the valley south of Winnipeg. Under a Special Flood Damage Reduction Agreement, the federal and provincial governments assisted individuals to raise, terrace, ring-dike, or move nearly 1,100 buildings within the flood-prone area, and to elevate the community ring dikes. These measures effectively floodproofed the valley to the 100-year flood level, a standard all subsequent construction must meet.

The time series of annual peak water level in Winnipeg and trends in maximum flow of the Red River at Emerson show a strongly cyclic pattern around a rising trend (Figure 18.2.4). It is likely that both climatic factors and human modification of the watershed are responsible for this. The underlying climatic cause is shown both by the cyclic component and by the close correspondence between flow of the Red River and storage changes in Devil's Lake, North Dakota, a large closed basin within the Red River watershed that reflects long-term water balance. Human factors that may contribute to the trend include land-use changes and the construction of agricultural drainage systems that reduce natural storage and increase effective drainage area. Regardless of the cause, however, the decision to proceed with such a costly program was clearly justified by the events of the 1970s.

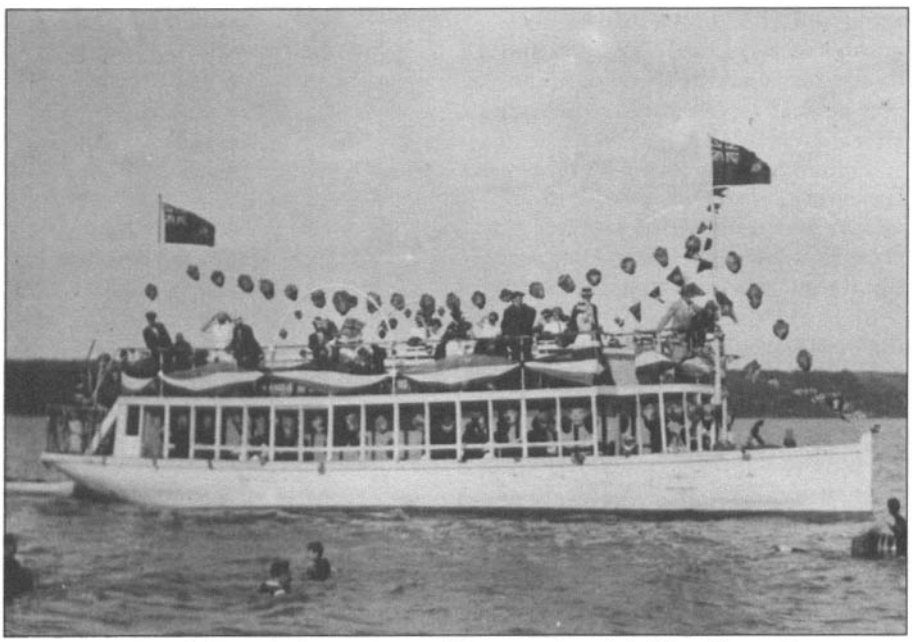

Figure 18.3.1 People from the Sanatorium at Ninette on Board the Marathon, *a Steam-powered Boat on Pelican Lake (Photograph: Western Canada Pictorial Index, University of Winnipeg, 1503-50079)*

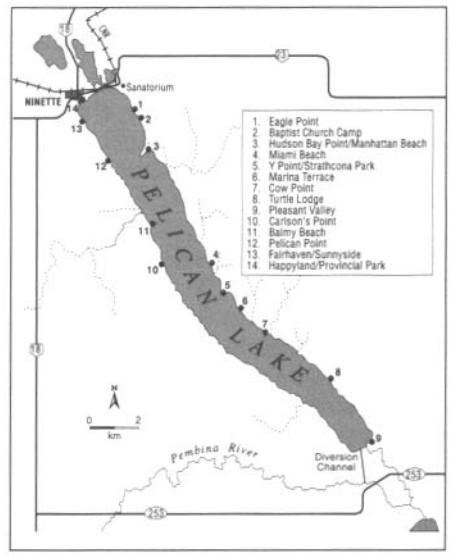

Figure 18.3.2 Location of Cottage Developments around Pelican Lake (Source: Modified from R. Gowing "Summer Cottage Development on Pelican Lake 1889–1989" in The Path of the Pioneers, Belmont and District 1889–1989 *[Belmont, MB: Belmont History Committee, 1989], 17)*

Case Study 18.3
The Changing Fortunes of Pelican Lake

John Welsted

History

Pelican Lake is part of the Pembina drainage basin. It empties into the Pembina River, which flows through southern Manitoba into the United States to join the Red River (Figure 18.2). The Pembina River does not flow through Pelican Lake, which is in effect a backwater. The absence of through flow and the shallowness of the lake (maximum depth 4.5 m)[1] have influenced its popularity as a resort area.

People who settled in the area in the 1890s soon recognized the potential of the lake, but after a promising start it has had a checkered history as a recreational location. By 1906 a company was operating a 60-foot (18.3 m) double-decker steamer, two 40-foot (12.2 m) boats, and 100 rowboats and canoes on the lake, and soon after, another company started up with two more 40-foot (12.2 m) boats (Figure 18.3.1). The boat companies maintained regular passenger service to all beaches around the lake because the steep-sided valley made access by land difficult.[2]

Tourists came by rail on day trips from Brandon and Winnipeg, arriving at the north end of the lake. They prompted the building of a "large" hotel at Ninette,[3] and summer cottages were built at Happyland, Fairhaven, and Balmy Beach (Figure 18.3.2). The YMCA bought land in 1905 and operated a summer camp at "Y point" for the next 45 years. Another area, Manhattan Beach, changed hands twice before being bought in 1939 by the Pentecostal Church, which has operated a summer camp there ever since.

On the whole, however, after the initial burst of activity in the first decade of the century, interest in the lake as a recreational resort declined, mainly because of a period of very low lake levels. The steamboats were removed, and by 1920 beaches were deserted and cottages had been abandoned or removed. The decline continued during the dry 1930s as lake levels continued to fall.

Following World War II, the fortunes of the area improved. A succession of developments took place on the shores of the lake (Figure 18.3.2). In 1950 the rural municipality of Strathcona purchased "Y point" and established Strathcona Memorial Park; cottages were built at Cow Point, Pleasant Valley (where a golf course was later built), Turtle Lodge, Marina Terrace, and Miami Beach. A Baptist church camp was also established. On the west shore, cottages were built at Sunnyside (the old Fairhaven), Pelican Point, Balmy Beach, and Carlson's Point.

By 1990 the lake was being used for swimming, power-boating, water-skiing, canoeing, and sailing; there were three campgrounds and approximately 800 cottages on the lakeshore.[4] However, all of these activities, and the economic fortunes of the village of Ninette, were adversely affected by low lake levels and poor water quality, principally in the form of algae. Fishing, including the once-popular ice fishing during the winter, was curtailed by a severe winter kill a few years earlier.

Regulation of Lake Level

The level of Pelican Lake has varied considerably over the past century. Moreover, because the lake is shallow, small height differences profoundly influence the location of the shoreline. Levels were high during the first decade of this century, but

fell from 1912, resulting in the first attempt to regulate the lake. In 1919 the Dominion Department of Public Works constructed a timber control dam on the Pembina River and a diversion channel from above the dam to carry water to Pelican Lake. The dam was soon damaged, so in 1926 an earthfill dam was constructed. However, this too fell into disrepair and the lake level fell during the dry 1930s.[5]

Conditions were also relatively dry during the 1950s, at the time of the postwar boom in cottage development, resulting in demands for a system to raise lake levels. Wet conditions returned during the 1960s, and high water levels caused erosion and flooding along the shore. Interest in lake regulation was renewed, now with the aim of keeping water levels down.

By this time the existing diversion works had been transferred to the province of Manitoba, which became responsible for maintaining the diversion channel.[6] In 1972 the Pelican Lake Level Advisory Committee was established by the provincial government to consider lake regulation. It recommended that levels be held within the range 1,351–1,351.5 feet (411.78–411.94 m) during the recreational season, but no action was taken.[7] Later, a series of dry years and falling lake levels prompted agitation for reconsideration of the 1972 plan. A review, completed in 1980, proposed both inlet and outlet channels to control the level of the lake.[8] Again no action was taken, but in 1990 increased local pressure prompted another scheme for lake-level regulation.

This last project is an overhaul and improvement of the existing but badly deteriorated system, with the aim of keeping the lake within the range 1,350–1,351.5 feet (411.48–411.94 m).[9] It has both an inlet and an outlet component (Figure 18.3.3). A weir on the Pembina River is designed to divert water into a channel leading to Pelican Lake, while ensuring some flow down the Pembina at all times. At high flows the Pembina River will overtop the weir. In essence, the plan is to divert water into Pelican Lake when the lake level is low and to allow water out of the lake when it is high.

Proponents claimed that the project would increase the recreational potential of the lake by deepening it and freshening it, and that it would safeguard against erosion of recreational developments along the shore.

Opponents expressed a number of concerns. Farmers who live "down valley" were concerned that increased flow from Pelican Lake would flood their land and that pollutants from the lake would be washed downstream. The Swan Lake Indian Band was concerned about the effects of the project on Swan Lake, downstream. Some biologists believed that the project would do little to relieve the algae problem. Other environmental and jurisdictional concerns were expressed at a Manitoba Clean Environment Hearing in March 1990, although surprisingly little attention was paid to the fact that the Pelican River is an international river and is the therefore governed by the provisions of the Boundary Waters Treaty.[10]

When water started flowing from the Pembina River during the early summer of 1992, proponents regarded it as a victory, as the water replenished Pelican Lake and lifted the morale of cottage owners.[11] Opponents conceded that they had lost on the main project but claimed that they had "gained a lot of concessions," although it is difficult to see what these were.[12] Abundant flow along the Pembina River during the spring of 1995 will have added more water to the lake, but it will be several years before we know whether the project is effective – whether this most recent inlet and outlet of Pelican Lake will prevent future ups and downs in the lake's fortunes as a recreational resource in southwestern Manitoba.

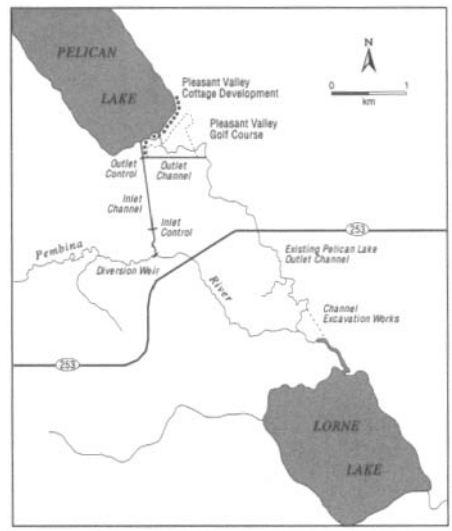

Figure 18.3.3 The 1990 Pelican Lake Enhancement Project (Source: Province of Manitoba, Pelican Lake Enhancement Project, Report on Hearing by the Manitoba Clean Environment Commission, *[Winnipeg: Province of Manitoba, 1990], 3)*

NOTES

1. Details of the lake depth are given on a photo map of Pelican Lake published by the Manitoba Department of Natural Resources, 1987. The greatest depths, indicated by the 4.5 m depth contour, are located on the northeast side of the lake.
2. R. Gowing, "Summer Cottage Development on Pelican Lake," in Belmont History Committee, *The Path of the Pioneers, Belmont and District 1889–1989* (Belmont, MB: Belmont History Committee, 1989), 16–20.
3. Day-trippers used the Brandon, Saskatchewan and Hudson's Bay Railway to Minto and the Canadian National from Minto to Ninette. Details of the former are given in J.C. Everitt, R. Kempthorne, and C. Schafer, "Controlled Aggression, James J. Hill and the Brandon, Saskatchewan and Hudson's Bay Railway," *North Dakota History* 56, 2(1989):3–19. Service to Ninette ceased in 1936.
4. R. Gowing, "Summer Cottage Development," 20.
5. A history of lake levels and lake-level regulation to 1972 is given in Pelican Lake Advisory Committee, *Pelican Lake Regulation* (Winnipeg: Pelican Rock Lake Advisory Planning Commission, 1972).
6. The exact transfer date was 1958.
7. Pelican Lake Advisory Committee, *Pelican Lake Regulation,* 1.
8. Details of the proposal are given in two reports: Province of Manitoba, *1980 Review of Pelican Lake Regulation* (Winnipeg: Province of Manitoba, 1980), and Province of Manitoba, *1980 Review of Pelican Lake Levels, Addendum One Relocation of Outlet Channel to West and South Boundaries of NW 1/4, Sec. 5, Twp. 4, Rge 15 WPM* (Winnipeg: Province of Manitoba, 1981).
9. For details see R. Oshoway, *Pelican Lake Enhancement Project Environmental Assessment* (Winnipeg: Province of Manitoba, Department of Natural Resources, 1990).
10. Details can be found in Province of Manitoba, *Pelican Lake Enhancement Project Report on Hearing by the Manitoba Clean Environment Commission* (Winnipeg: Province of Manitoba, Manitoba Clean Environment Commission, 1990).
11. *Brandon Sun,* 1 May 1992, 3.
12. Ibid.

PART 4

RECREATION

Manitoba is blessed with rich and varied opportunities for people to participate in outdoor and indoor recreation and tourism, in organized and unorganized fashions. A. Gill (Chapter 19) discusses the importance of recreation and tourism to the economy of the province as well as to the lifestyles and the quality of life of Manitobans. For a variety of reasons this is a major growth sector of the Manitoba economy and of Canada as a whole, and its significance seems likely to increase into the foreseeable future. A particularly important aspect of recreation in Manitoba is the "cottage experience," which J. Selwood explores in Case Study 19.1 (page 296) using the example of the summer cottage at Lake Winnipeg.

National and provincial parks are an important focus for many recreational activities. The most significant park in Manitoba is Riding Mountain National Park, dominated by the seasonal central place of Wasagaming, a resort discussed by C. Stadel in Case Study 19.2 on page 298. Recently interest has been kindled in various aspects of the heritage of Manitoba, some of which is now housed in a series of museums. As E.L. Syms (Case Study 19.3 on page 300) tells us, these museums are found both in larger centres such as Winnipeg and in smaller places such as Boissevain and Wawanesa, where the museum has become a focus for locals and tourists alike.

Sports, long a popular form of amateur recreation in the province, have also had a professional side that has made an important contribution to life in Manitoba almost since its inception as a province. In Chapter 20, M. Mott, a longtime sports enthusiast and historian, traces the many attempts that have been made to bring professional sports teams to Manitoba; the Winnipeg Whips (Case Study 20.1 on page 315) are a classic example.

At the beginning of this book, we indicated that the size of Manitoba is critical to its development, and that distance has long affected the spatial arrangement and the success of activities within the province. This generalization is true of recreation, tourism, and sports. As Mott points out, geographic variables have been critical to the success — but more often the failure — of professional sports in Manitoba, where it can be "tough to make it."

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RECREATION AND TOURISM IN MANITOBA

19

Alison M. Gill

Tourism contributes almost $1 billion annually to the Manitoba economy, and there are about 25,000 jobs in the tourism industry. This makes tourism the sixth most important contributor to the provincial economy, accounting for 4.3 percent of the gross provincial product in 1989.[1] The industry has been growing strongly recently, suggesting that tourism will be increasingly important in the province's future. The figures cited here represent the direct impact of tourism on the economy; many indirect and induced effects are more difficult to account for because of the fragmented nature of the industry and the problem of precisely defining the nature of tourism.

The distinction between a "tourist" and a "recreationist" has been made along a continuum defined in relation to leisure activity. Recreationists are generally considered to be those who engage in recreational activities a short distance from home, without an overnight stay. Tourists, who may engage in recreational activities using the same facilities, travel further and stay away from home at least one night. A tourist can also be a business traveller who, while using transportation and hospitality services, may not engage in leisure activities. For statistical purposes, Travel Manitoba considers any traveller engaged in a trip outside his or her own community to be a tourist.

Manitobans account for 79 percent of all trips within Manitoba, and over a third of these are day trips. Day-trippers are often recreationists using the many parks and attractions within the province, thus blurring the distinction between tourist and recreationist.

Manitoba offers the tourist a wide range of both natural and cultural attractions. Natural features include lakes, beaches, rivers, wilderness, and wildlife. Many of the more outstanding features are managed within the provincial- and national-park systems, although private enterprises cater especially to the demand for fishing and hunting. As the largest tourism centre, Winnipeg has the broadest array of cultural attractions, but the diverse cultural landscapes and numerous festivals and events throughout the province are important elements of local tourism.

The first part of this chapter describes the tourism and recreational resources of the province, including their infrastructural and organizational components. This is followed by an overview of demand factors that reviews the market profiles of visitors and considers the economic impact of tourism. The chapter concludes with a discussion of strategic-planning initiatives for tourism and parks in Manitoba.

TOURISM AND RECREATIONAL RESOURCES

A very general distinction can be made between the two major components of the tourism resource base in Manitoba. First, Winnipeg offers the urban and cultural attractions of a large city and is a popular destination for non-Manitoba residents as well as an attraction for rural Manitoba residents. Second, rural Manitoba is the rest of the province and serves a predominantly

Manitoban market seeking family-oriented outdoor activities. In rural Manitoba the diversity of natural and cultural resources results in distinct regional differences (Figure 19.1).

Natural Resources

Manitoba's diverse physical environment offers an array of outdoor recreational opportunities in all seasons. Three-fifths of the province lies within the Canadian Shield (Figure 2.8 on page 21), an essentially wilderness environment of innumerable lakes, rocks, and boreal forest.[2] The Hudson Bay coast and Lowlands offer a coastal subarctic environment, while the grassland and parkland ecosystems of the Interior Plains present a rural agricultural setting interspersed with natural features.

Riding Mountain is the dominant topographic feature, and its ecological and recreational resources are protected within the national-park system. The diverse glacial landforms of the Interior Plains, such as the moraines of the Brandon Hills (Case Study 2.2 on page 25), the kettle lakes of the Minnedosa region, and the deltaic sand dunes near Carberry (Case Study 4.1 on page 56) all offer a variety of outdoor recreational opportunities. Many of these features are managed for recreation within the provincial-park system.

Water is a central attraction for recreationists, and Manitoba's numerous lakes attract summer (and a few winter) recreationists (Chapter 18). Manitobans are especially drawn to either the beaches of Lake Winnipeg or the Canadian Shield lakes of the Whiteshell region of eastern Manitoba. Both areas are within weekend or day-trip distance from Winnipeg and have developed as cottage destinations (Case Study 19.1 on page 296).

Clear Lake in Riding Mountain also developed as a centre for summer cottages, and while it originally attracted cottagers from the western Manitoba market, it now attracts a provincewide market (Case Study 19.2 on page 298). While Lake Winnipeg has gained particular renown for its white-sand beaches, all lakes offer boating, fishing, picnicking, and camping (Case Study 18.3 on page 285). Recreationists at lakes make use of camping and picnic facilities, and other accommodation and service facilities have grown around this demand.

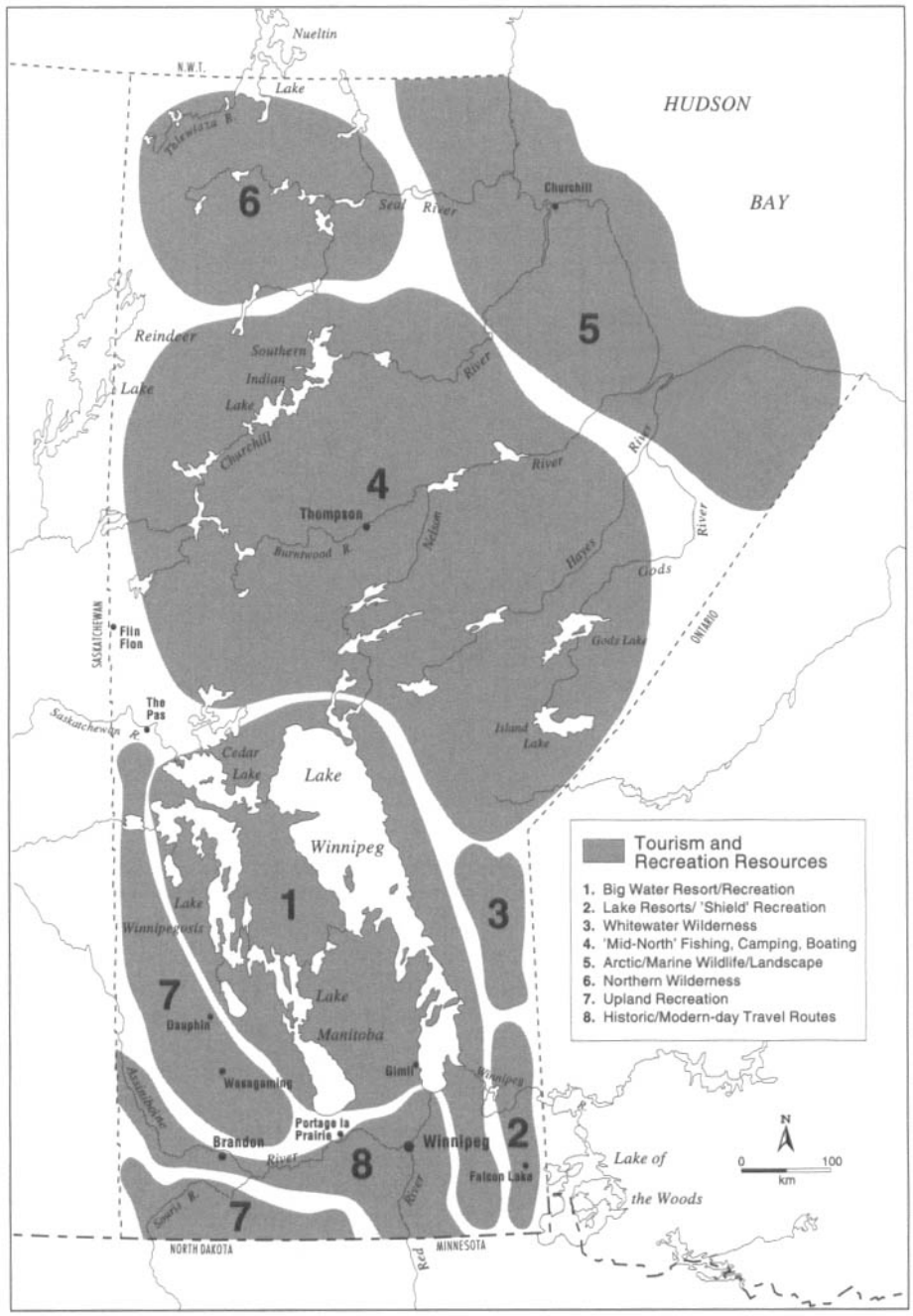

Figure 19.1 Tourism and Recreation Resources in Manitoba (Source: Manitoba Natural Resources, A System Plan for Manitoba Provincial Parks *[Winnipeg: Manitoba Department of Natural Resources, 1985])*

While the continental location of Manitoba results in cold winters that nonresidents generally view as undesirable, the arctic air masses also bring high-pressure systems and plenty of sun (Chapter 3). This provides residents with an appealing situation for skiing, snowmobiling, and other outdoor winter activities. Although the lack of suitable terrain limits downhill skiing to Mt. Agassiz, on the Riding Mountain Escarpment, and a few small local ski operations (such as Falcon Lake ski resort in Whiteshell Provincial Park, Holiday Mountain in the Pembina Valley, and Ski Valley near Minnedosa), many areas are suitable for cross-country skiing, a

popular winter activity throughout the province. In Riding Mountain National Park and in the provincial parks, groomed trails are common and lodges offer winter packages.

Wildlife and fish are also important natural resources in Manitoba, as sport fishing and hunting contribute significantly to the provincial economy. Among the most important fish species are walleye (pickerel), northern pike, bass, whitefish, lake sturgeon, and trout. Both walleye and trout are stocked by the Manitoba Fisheries Branch in order to maintain supply.

Wildlife resources are important not just for hunting but also increasingly for such activities as wildlife viewing and photography. The Churchill region is the most important wildlife-viewing area, and international visitors come to see the polar bears and beluga whales (Case Study 12.1 on page 172).

The primary wildlife species hunted in Manitoba are black bear, moose, and white-tailed deer, as well as waterfowl and game birds. As the seasons for black bear, moose, and waterfowl fall at the same time, several outfitters now offer combined packages. Manitoba is at the northern limit of the white-tailed deer range, and body and antler size tend to be larger than further south, thus attracting trophy hunters. Several thousand nonresident goose hunters are attracted to Manitoba each fall. In the Hudson Bay Lowlands, subarctic coastal hunting for Canada and snow geese occurs in September. Further south, field and marsh hunting around The Pas, in the Interlake region, and in southwestern Manitoba occur later, as the staging populations move south.

About 140 lodges and resorts and over 100 licensed outfitters cater to anglers and hunters in Manitoba. They vary from rustic fly-in camps to luxury resorts offering a range of outdoor recreational opportunities. Some resorts also offer meeting and convention facilities.[3]

Cultural Attractions

The history and settlement of Manitoba have created a rich cultural heritage. Early heritage is associated with the fur trade era and the river routes of the voyageurs between trading posts. Lower Fort Garry near Winnipeg, managed by Parks Canada, is the major interpretive site and attracts many visitors. Fort Prince of Wales on Hudson Bay near Churchill is more remote. Work recently began on a new recreational waterway, Voyageur Heritage Waterway, marking the exploratory route of La Vérendrye along the Winnipeg River, which links Manitoba, Minnesota, and northwestern Ontario. Recently, many communities have begun including native history in their community tourism resources.

Throughout the province, the ethnic groups who settled the agricultural lands celebrate their heritage with a variety of tourist attractions, which are the mainstay of the tourism economy in many small communities. The cultural landscape — expressed, for example, in the compact Mennonite village structures south of Winnipeg (Case Study 7.3 on page 105) or the distinctive Ukrainian churches in the Dauphin area — attracts some visitors, but culture as a tourist commodity is more accessible in pioneer museums. There are over 75 such museums in communities throughout Manitoba (excluding Winnipeg), including the Mennonite Heritage Village in Steinbach and the Gimli Historical Museum, which preserves Icelandic and Ukrainian heritage (Case Study 19.3 on page 300).

Festivals are another main cultural-tourism product. One of the largest is the National Ukrainian Festival held near Dauphin, which attracts 40,000 visitors during a weekend in August and was recently listed among the top 100 festivals in North America. The Festival du Voyageur in St. Boniface is one of Canada's top three winter festivals and celebrates the French Canadian culture of the fur trade era. The Northern Manitoba Trappers' Festival, held in The Pas, is western Canada's oldest winter festival and also attracts visitors from a wide area.

Many smaller community festivals throughout the province help create a distinctive image for their communities, an important element in attracting visitors. Symbols such as Tommy the Turtle at Boissevain; Flintabbatey Flonatin, a character from a novel that gave Flin Flon its name; the world's largest smoking pipe at St. Claude; the Viking statue at Gimli; and the 5 m high statue of a sharptail grouse at Ashern are all ways by which communities have sought to establish distinctive images.

The Pembina Valley region promotes itself as "Festival Country" and holds many events, such as the Carman Potato Blossom Festival, Pembina Threshermen's Reunion, Morden Corn and Apple Festival, and the Manitoba Sunflower Festival in Altona. Winnipeg has the greatest number of cultural attractions, ranging from ethnic festivals such as Folklorama to the internationally renowned Royal Winnipeg Ballet and Winnipeg Symphony Orchestra.

Sporting events are also important generators of travel within the province. Winnipeg has nationally competitive teams such as the Winnipeg Jets ice-hockey team and the Winnipeg Blue Bombers football team (Chapter 20). Outside Winnipeg, Brandon as the second largest city has hosted major sporting events, including the Canada Winter Games (1979), the World Youth Baseball Tournament (1992 and 1994), the Scott Tournament of Hearts (1993), and the World Curling Championships (1995). The second-largest rodeo in Canada is held annually at Morris. Local tourism is generated through curling bonspiels, local rodeos, and hockey and baseball tournaments.

In recent years there has been an explosion in the number of golf courses constructed both to attract visitors and as an amenity for local residents. In 1990 there were 107 courses throughout Manitoba. Most of the 18-hole courses are either near Winnipeg or in resort areas, although many small communities also have golf courses.

INFRASTRUCTURE AND TOURIST SERVICES

Infrastructure and tourist services are essential components of a tourism industry. Manitoba markets its location as central to North America (Figure 1.1 on page 4). Its

market is essentially a "rubber-tire" one — that is, most visitors use the road system. The Trans-Canada Highway and the Yellowhead Highway traverse the province, with additional major highway links north through the Interlake region to Thompson and from Brandon north through Dauphin to The Pas and Flin Flon. Several north-south highway connections link Manitoba to North Dakota and Minnesota. Winnipeg is the major point of entry for airline travellers, with direct flights to major Canadian cities and some international destinations. For adventure travellers to Churchill and other northern locations, there is a railway connection as well as charter and scheduled air service.

Accommodations in Manitoba vary depending on their location and the nature of the tourism resources. Winnipeg and other larger centres such as Brandon have a range of hotels and motels. Hotels at the high end of the market are primarily located in Winnipeg to meet the needs of the business and convention market, but high-quality accommodations are also available in some resort settings such as Clear Lake, Falcon Lake, and the shores of Lake Winnipeg.

Conventions are an important component of the out-of-province tourist market, with Winnipeg alone hosting 85,000 delegates in 1990. Because much of rural Manitoba's tourism market is associated with family outdoor recreation, campgrounds in provincial parks and Riding Mountain National Park are an important component of the seasonal accommodation (Case Study 19.2 on page 298). Farm vacations are offered at about 40 locations, catering to a variety of groups including schoolchildren, youth groups, cross-country skiers, and hunters. Bed-and-breakfast operations in private homes and farms are increasing in number.

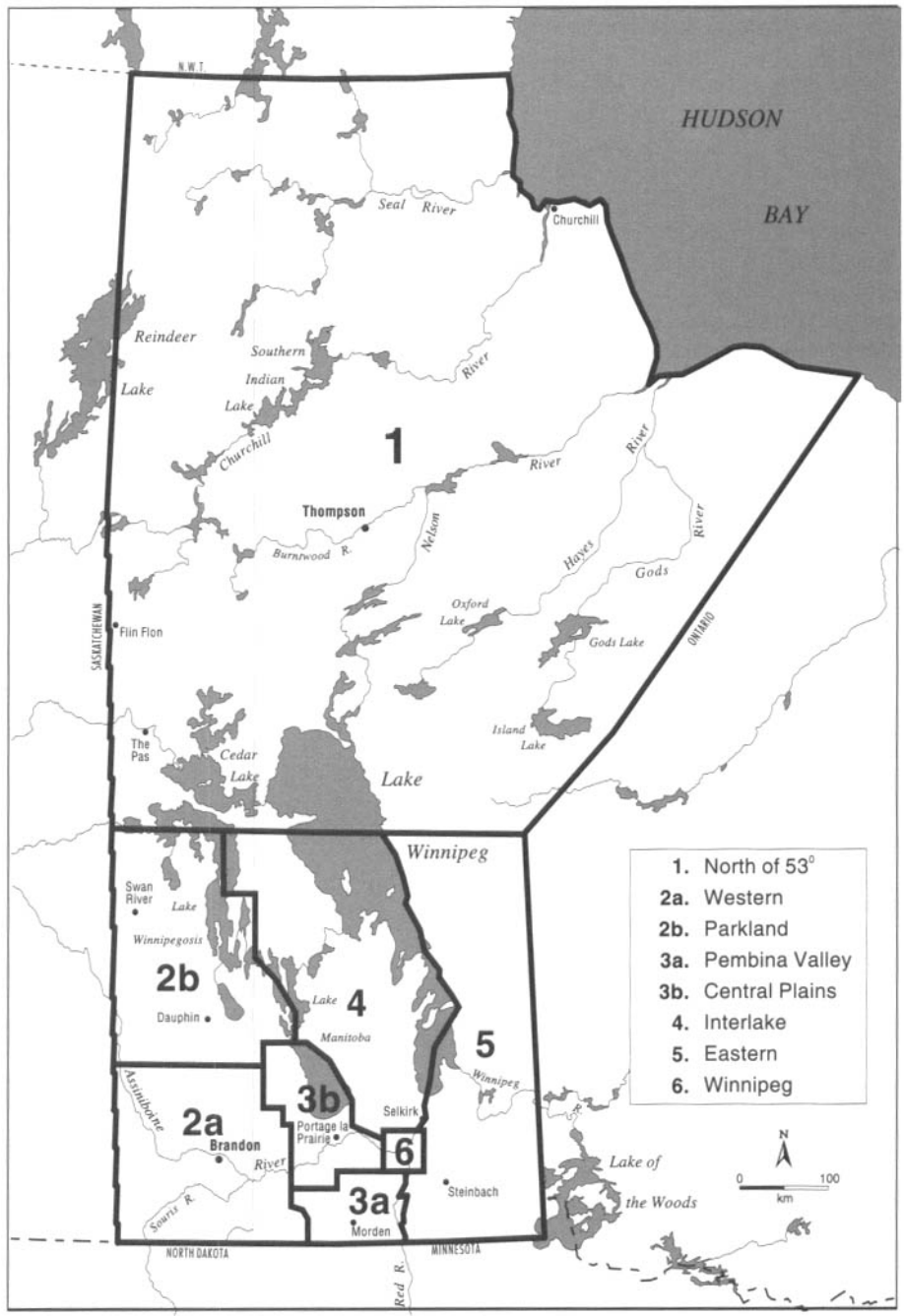

Figure 19.2 Manitoba's Tourism Zones (Source: Travel Manitoba, Manitoba Vacation Planner *[Winnipeg: Travel Manitoba, 1991])*

ORGANIZATION AND MANAGEMENT OF TOURISM AND PARKS

In Manitoba, the provincial government administers tourism through Travel Manitoba, a branch of the Ministry of Industry, Trade and Tourism. This office is responsible for tourism planning, development, marketing, and information services. Travel Manitoba works closely with tourism industry representatives, especially the Tourism Industry Association of Manitoba, a nonprofit, private association. The Tourism Industry Association operates at a regional level, coordinating and promoting activities in each of the main tourism zones (Figure 19.2). Many of the more significant natural and cultural tourism and recreational resources in Manitoba are managed by either the Parks Branch of the Manitoba Ministry of Natural Resources or the Canadian National Parks Service.

Publicly Managed Parklands

A major aim of the Provincial Parks Branch is to manage representative parks for each of the 12 distinctive natural regions of Manitoba (Figure 19.3).[4] Currently there are some gaps in the system, as the parks system in Manitoba is relatively

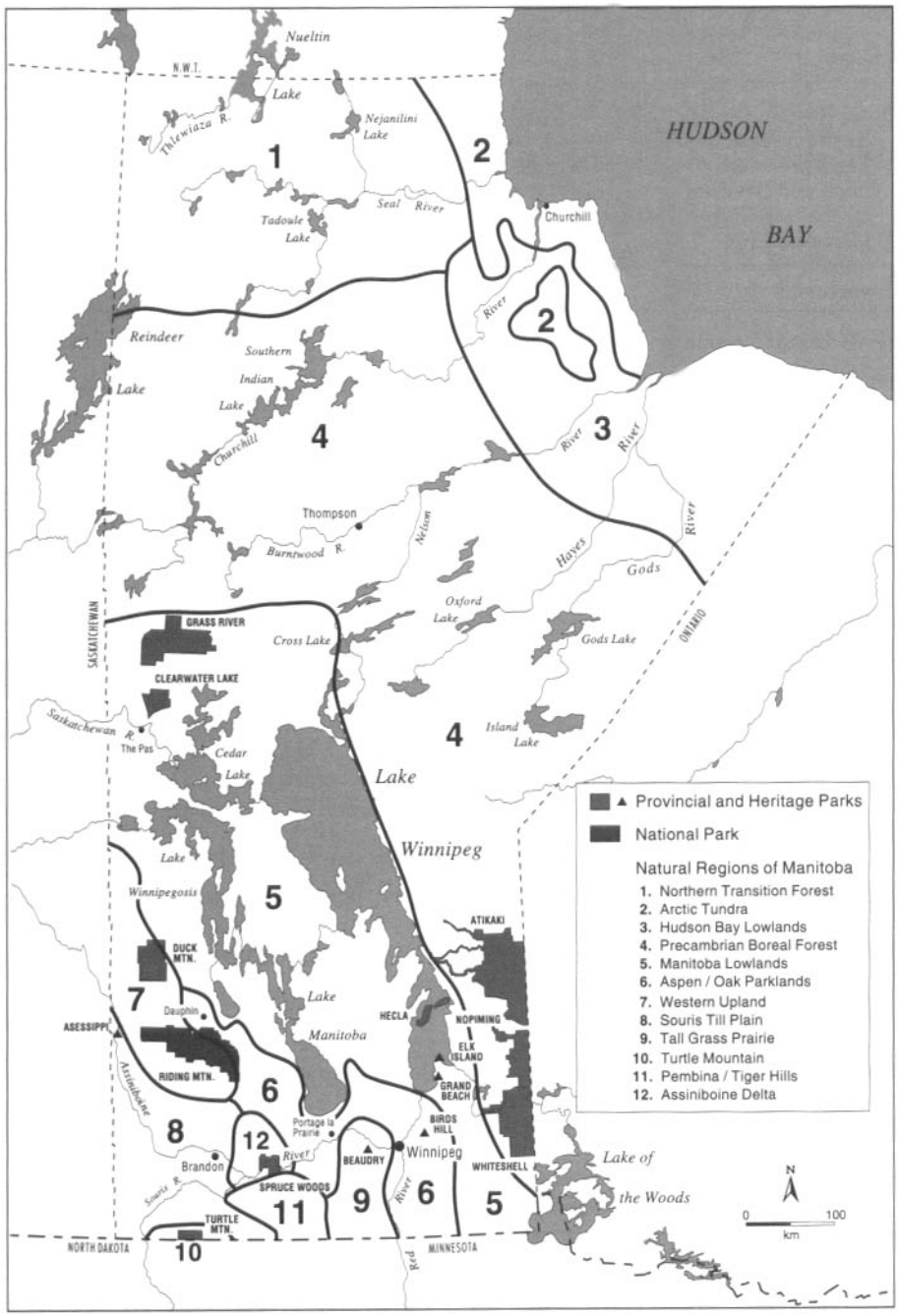

Figure 19.3 Natural Regions and Major Provincial and National Parks of Manitoba (Source: Manitoba Natural Resources, A System for Manitoba Provincial Parks *[Winnipeg: Manitoba Department of Natural Resources, 1985])*

new, with legislation dating back only to 1960. Underrepresented natural regions include the Northern Transition Forest, Arctic Tundra, Pembina/Tiger Hills, and Hudson Bay Lowlands.

The current Provincial Parks Act was passed in 1972. The act identified 12 types of park property, representing the varied mandate of the Parks Branch to manage both physical and cultural resources for recreation, conservation, and preservation. These include such categories as provincial natural parks, recreational parks, wilderness parks, recreational waterways, and provincial heritage sites.[5] The first provincial parks, established in 1961, were Duck Mountain, Whiteshell, Turtle Mountain, Grand Valley, and Patricia Beach. Some of these had previously been designated as provincial forests.

By 1992 there were 127 provincial parks, including 9 large natural parks, 31 recreational parks, 6 heritage parks, 80 small wayside parks, and one wilderness park (Figure 19.3). The latter, Atikaki Wilderness Park, was established in 1985 and includes one of Canada's 10 designated heritage rivers, the Bloodvein. Within the parks system are 67 campgrounds with 6,400 campsites, 152 commercial recreational businesses, 2 golf courses, and about 6,700 cottages.

There have been many changes in the parks over the years to meet the recreational demands of visitors. Traditional activities such as cottaging and camping have led to major developments in some parks, such as Whiteshell, which contains 3,000 cottage lots and about 2,000 campsites. Parks near urban areas, such as Bird's Hill Park near Winnipeg, have also been developed to provide a wide range of outdoor recreational opportunities.

Other changes reflect the multiple-use resource mandate of many of the parks, which not only accommodate recreational activities but may also be used for logging, trapping, hunting, mining, and commercial fishing. In particular, logging has led to extensive access developments in major provincial parks, such as Duck Mountain, Grass River, and Nopiming (Figure 19.3).

While most recreational demands are accommodated within the provincial-park system, a number of other designated natural lands and special places are also managed by the provincial government. These include ecological reserves, provincial forests, wildlife management areas, and heritage sites. The use of these areas varies, and the government is adopting an integrated management approach as part of its overall sustainable-development strategy.

Riding Mountain National Park is the only national park in Manitoba. It was first dedicated as a forest reserve in 1895, and became a national park in 1930. Its earlier use included the development of seasonal cottages and a townsite at Wasagaming, and permitted leases for grazing and timber cutting. Current management policy emphasizes the park's protection as an example of ecologically significant Canadian landscapes (Case Study 19.2 on page 298).

At the opposite end of the spectrum from national parks, municipal parks provide recreational facilities within their urban and near-urban jurisdictions. These range from large urban parks such as Assiniboine Park in Winnipeg to local neighbourhood playground facilities, swimming pools, arenas, and golf courses. Most of the 107 golf courses in Manitoba are public, including 6 in Winnipeg. The courses at Hecla Island, Falcon Lake, and Wasagaming are nationally known for their scenic settings.

TOURISM DEMAND AND ECONOMIC IMPACT

Patterns of Demand

Geographic proximity is an important factor explaining the patterns of tourism demand in Manitoba. Almost 80 percent of all travel within the province is by Manitobans themselves. Visitors from adjacent provinces and states account for a further 12.5 percent of trips. In order of decreasing magnitude, these visitors come from Saskatchewan, northwestern Ontario, Minnesota, and North Dakota. Tourists from further afield are generally representative of specific market segments. They are attracted by particular features, such as opportunities for angling, wildlife viewing, wilderness adventure, conventions and meetings, or motorcoach tours. In 1988 visitors from the United States accounted for 9.1 percent of the 6.8 million trips in Manitoba. The United Kingdom, Germany, and Japan are the most important overseas markets, although in 1988 visitors from these places represented only 1.1 percent of the total market.[6]

In order to market tourism in Manitoba more effectively, Travel Manitoba surveys visitors to ascertain their reasons for pleasure trips. The reasons for taking trips in Manitoba vary between market segments. For Manitobans travelling in their own province, pleasure is a major motivation, with most trips being to the Interlake and Eastman regions, the main recreational playgrounds for Manitobans. Younger adults (20–44 years of age) account for most of the in-province trips taken by Manitobans; few seniors take short local trips.

Visiting friends and relatives accounts for about 29 percent of trips by Manitobans, but it accounts for almost half (47.9 percent) of trips to Manitoba made by Saskatchewan residents. American visitors from adjacent states come mostly for pleasure. Winnipeg is an important destination, especially for visitors from the States and from other Canadian provinces.

Table 19.1 Economic Impact of Tourism in Manitoba, 1987–89

Factor	1987	1988	1989
Total Revenues	730	869	999
Accommodation	92	115	120
Transportation	349	408	494
Food and Beverage	156	193	207
Recreation and entertainment	48	73	86
Miscellaneous	85	80	92
Investment	109	130	150
Government Revenues	294	350	420
Federal	193	230	264
Provincial	101	120	138
Employment (Person-year)			
Direct	19,800	22,600	24,800
Total	28,400	32,400	35,600
Income			
Direct	537	639	735
Total	931	1,109	1,275

Note: All financial figures are in millions of dollars.

Source: Industry, Science and Technology Canada, *Canadian Tourism Facts* (Ottawa: Industry, Science and Technology Canada, February 1989, 1990, 1991).

Impact of Tourism

Tourism affects the economy of Manitoba by generating revenue from tourist expenditures and by creating jobs and tax revenues. It also contributes to the economy as a result of the "multiplier effect," as indirect and induced impacts generate additional employment and income (Table 19.1).[7]

In recent years Manitoba has been showing steady growth in tourism. Indeed, the 1989 revenues presented in Table 19.1 represent a 16 percent increase over the previous year, and 1988 revenues were 19 percent greater than in 1987. While the recessionary conditions of the early 1990s have slowed growth, and visits by Americans were down during 1990 and 1991, moderate but steady growth is predicted.

Winnipeg captures a large part of provincial tourism income. A study by Tourism Winnipeg estimated that the 2.5 million visitors to the city in 1990 spent $275 million, mostly on food, beverages, retail goods, and accommodation. Each dollar generated another dollar in the local economy, resulting in total revenues of $514 million for the city and $586 million for the province as a whole. Tourism in Winnipeg also generated $122 million in government taxes.

TRENDS AND PLANNING

Many social and economic changes occurring in today's society challenge the agencies managing tourism and recreational resources. On the one hand, leisure demand is increasing, as is competition between destinations. This requires development of new products and effective marketing based on a good understanding of the demand. At the same time, growing environmental concerns require sensitivity to the sustainability of tourism resources. In all cases, strategic planning is needed, and is being undertaken by the lead agencies — Travel Manitoba

and the Manitoba Provincial Parks Branch.

The development of tourism in Manitoba is stimulated partly by funds received from the federal government through Canada-Manitoba Tourism Development Agreements, which are administered through the Western Economic Diversification Office. A 1989 agreement resulted in $30 million to stimulate development, with an additional $5 million of federal funding in 1991. The purpose of this funding is to encourage joint federal, provincial, and private-sector programs. As a first step in strategic planning, Travel Manitoba is undertaking a product/market classification. This will result in a series of maps showing the location of tourism products and identifying the strengths and weaknesses of the products.

General strategies for the tourism regions are already being developed. In Winnipeg, where the diversity of cultural, recreational, and heritage tourism products draws most visitors, expansion of existing festivals (such as Folklorama, the Fringe Theatre festival, and Riverlife) and development of new ones are among the initiatives being supported. In the Interlake, the aim is to develop major four-season resort facilities with the expansion of accommodations and services. Beach resources will be complemented by entertainment and recreational facilities.

At Gimli, a major waterfront and hotel complex has been developed, and a themed streetscape creates a resort atmosphere. A major conservation and interpretive centre at Oak Hammock Marsh has been completed, and the Hecla Icelandic Heritage Village is in the planning stages. In the Norman region (north of 53°N), the focus is on development of quality outdoor recreational facilities to support specialty markets in wilderness adventure activities such as angling and canoeing. Cultural and historical resources are also seen as important strengths of this region.

The Parkland region attracts tourists travelling by automobile. The areas around Riding Mountain National Park and Duck Mountain Provincial Park and along the Yellowhead Highway are especially targeted for enhancement of attractions, events, and facilities. The Western, Central Plains, and Pembina Valley regions are important for rural tourism. Upgrading and promoting attractions and events are important to stimulate increased day use of these areas. The focus of development strategies for the Eastern region is on water-based facilities and associated services and accommodations. The development of four-season resort communities is a major objective, with people being encouraged to use this area for mini-vacations.

Strategic planning is being conducted for provincial parks under the larger provincial mandate to develop an overall sustainable-development strategy. The Manitoba Round Table on Environment and the Economy, established in 1988, is the coordinating body for this. A first priority will be to review and amend the Park Lands Act of 1960 to ensure that the principles of sustainable development are embodied and made operational.

Recommendations call for expansion of the parks system to ensure representativeness and protection of the province's natural regions and significant cultural and heritage resources. Together with other agencies, the Round Table's target is to protect 12 percent of each ecosystem from any activity — such as commercial logging, mining, or hydro-electric development — that could significantly affect natural habitat.

With similar objectives in mind, Parks Canada is also reviewing the representativeness of its system. A proposal to establish a new national park in the Arctic Tundra/Hudson Bay Lowlands natural region around the Churchill/York Factory area is currently being considered, and there has been lobbying for the establishment of a national park at the north end of Lake Winnipeg. The Churchill area is the world's largest known polar-bear denning site, and also has large numbers of nesting migratory birds and a rich historical and cultural heritage.

Tourism and recreational resources in Manitoba mainly serve the residents of the province. The maintenance and further development of these resources is important not only because of tourism's significant contribution to the provincial economy but also for the quality of life of Manitobans.

The province has a diverse natural and cultural heritage. Development and marketing of many of these resources will undoubtedly ensure steady growth in tourism for the foreseeable future. Strategic planning, combined with increasing awareness of the need to consider the sustainability of the resource base, will help improve the quality of tourism and recreational resources.

NOTES

1. Statistics on the number of visitors, their economic impact, their activities, and their travel motivations are collected regularly by Travel Manitoba. Tourism Canada, through its *Canadian Travel Survey,* also collects longitudinal data on travel patterns and behaviour.
2. Much of Manitoba beyond the agriculturally settled area is considered by the tourist as a "wilderness environment." Using a strict definition of "wilderness" as a roadless area unchanged by human activity, much of the province would not qualify, but the concept of wilderness is a perceptual one and thus relative to experience.
3. Detailed information on the tourist attractions of Manitoba are published each year by Travel Manitoba. Publications include *Manitoba Vacation Planner, Manitoba Fishing and Hunting Adventures, Manitoba Accommodations and Travel Services, Events Guide, Spectacular Parks and Outdoor Adventures Convention Facilities Guide.* They can be obtained from travel information centres or Travel Manitoba, 7–155 Carlton St., Winnipeg, MB R3C 3H8.
4. The overall plan for Manitoba provincial parks is presented in Manitoba Department of Natural Resources, *A System Plan for Manitoba's Provincial Parks: Technical Report* (Winnipeg: Department of Natural Resources, Planning Section, Parks Branch, 1985). Recent strategic-planning directions are discussed in Manitoba Round Table on Environment and Economy, *Sustainable Development: Workbook on Natural Lands and Special Places* (Winnipeg: Manitoba Round Table on Environment and Economy, 1992).
5. The complete list of 12 different categories of park property designated

under the 1972 Provincial Parks Act is as follows: natural park, wilderness park, recreational park, recreational trailways, parkways, recreational waterways, heritage parks, wayside parks, marine parks, access sites, information centres, and seasonal dwelling units.

6. Data on tourism demand are derived from Travel Manitoba, *Marketing Plan 1990* (Winnipeg: Travel Manitoba, 1990) and Tourism Canada, *Canadian Tourism Facts* (Ottawa: Tourism Canada, Industry, Science and Technology Canada, 1991).
7. The economic impact of tourism within the province is calculated for purposes of provincial statistics, but the total impact of tourism is greater because other provinces and regions derive some value from indirect and induced impacts. Indirect impacts are those generated by expenditures of tourism entrepreneurs on goods and services that support the tourism industry. Induced impacts come from consumption spending of wages and salaries earned in the tourism industry.

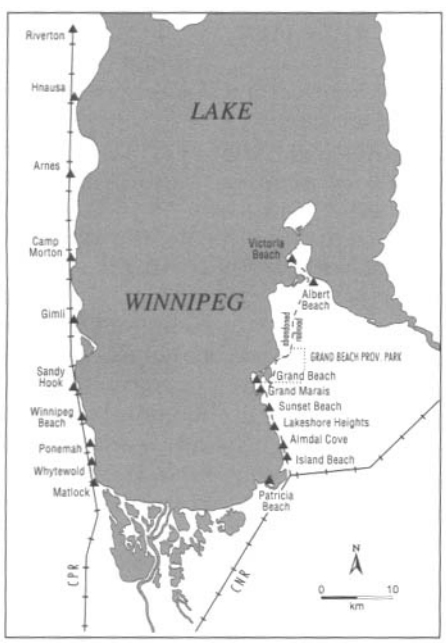

Figure 19.1.1 Southern Lake Winnipeg Cottage Communities

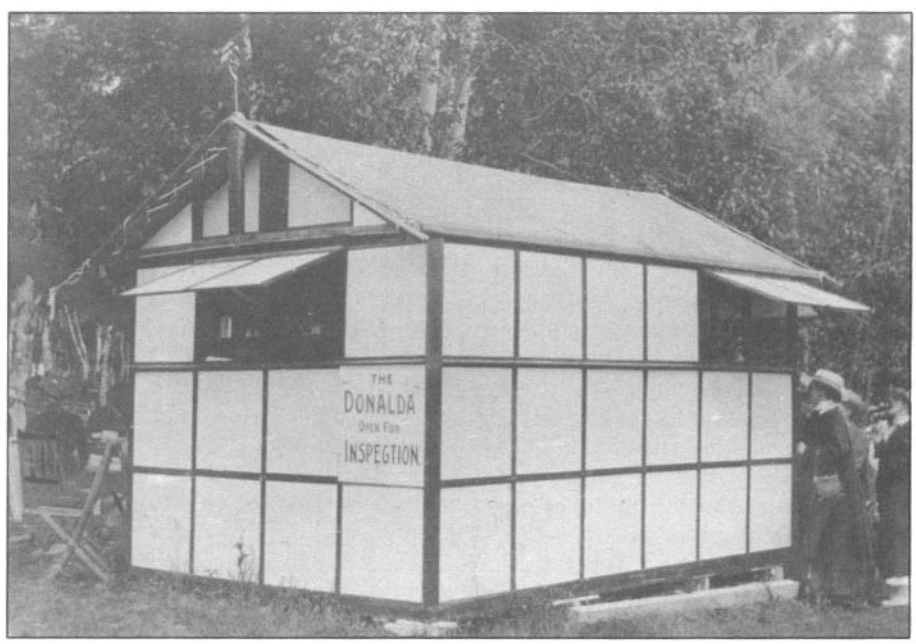

Figure 19.1.2 A Canadian Northern Railway "Donalda," a Temporary Cottage of Canvas and Timber Construction, at Grand Beach, about 1916. (Photograph: Western Canada Pictorial Index, University of Winnipeg, 757-22823)

Case Study 19.1
The Summer Cottage at Lake Winnipeg

John Selwood

The summer cottage is a fact of life for many Manitobans, particularly in the vacation communities around the south basin of Lake Winnipeg (Figure 19.1.1). Many thousands of Manitobans are drawn to the lakeshores every summer, and increasing numbers of people are becoming year-round visitors. Although cottaging began at Lake Winnipeg before the turn of the century, not until the lake became accessible by rail did recreational cottage development begin in earnest.

As early as 1900, the principal officers of the Canadian Pacific Railway (CPR) were persuaded that there was profit to be made in catering to Winnipeggers' growing demands for vacation resort property. After a brief survey of Lake Winnipeg's western shoreline, the CPR acquired land at Winnipeg Beach and extended a branch line from Selkirk to that point.

The line was completed to Winnipeg Beach in 1903, to Gimli in 1906, and to Riverton in 1914. It led to the creation of several lakeside cottage communities on the lake's western shore, including Matlock, Whytewold, Ponemah, and, of course, Winnipeg Beach itself. Winnipeg Beach was more than a cottage community: it was the attraction that would make the whole concept work. Over the next several decades, hundreds of thousands of Winnipeggers would pay the CPR to take them up to the lake for the day or evening, to enjoy the beach, the rides, the dance hall and concessions.[1]

Not to be outdone, by 1916 the Canadian Northern Railway had put in a line up the east side of the lake, north to Victoria Beach.[2] This line also spawned a number of cottage communities, including Albert Beach, Balsam Bay, and, most noteworthy, Grand Marais and Grand Beach. The latter, with its own boardwalk, concessions, dance hall, and "moonlight special," was in direct competition with Winnipeg Beach.[3]

For many years the cottage communities relied on the railways for access, although automobile owners who were prepared to brave the poor road conditions were able

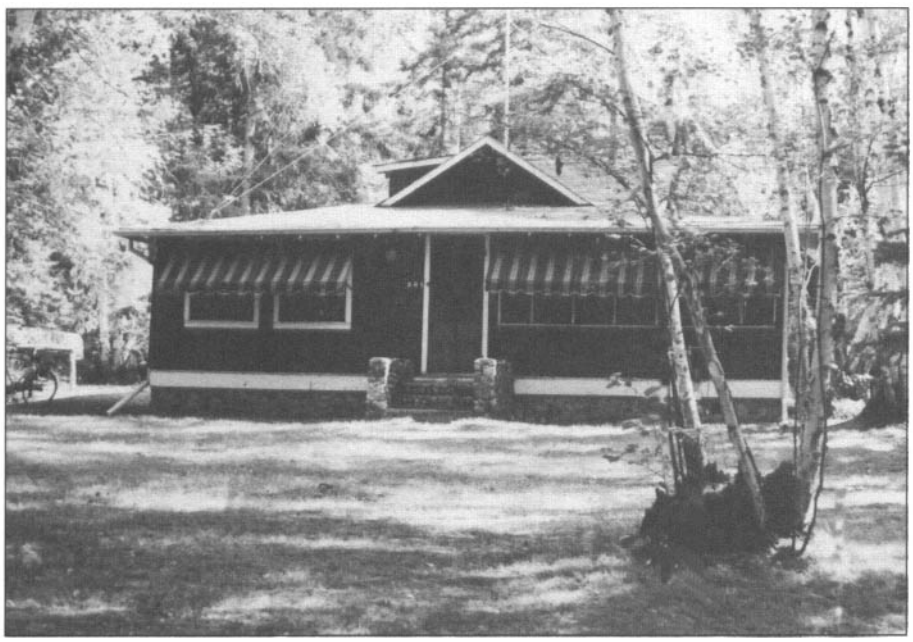

Figure 19.1.3 A Spacious Cottage at Victoria Beach (Photograph: J. Selwood)

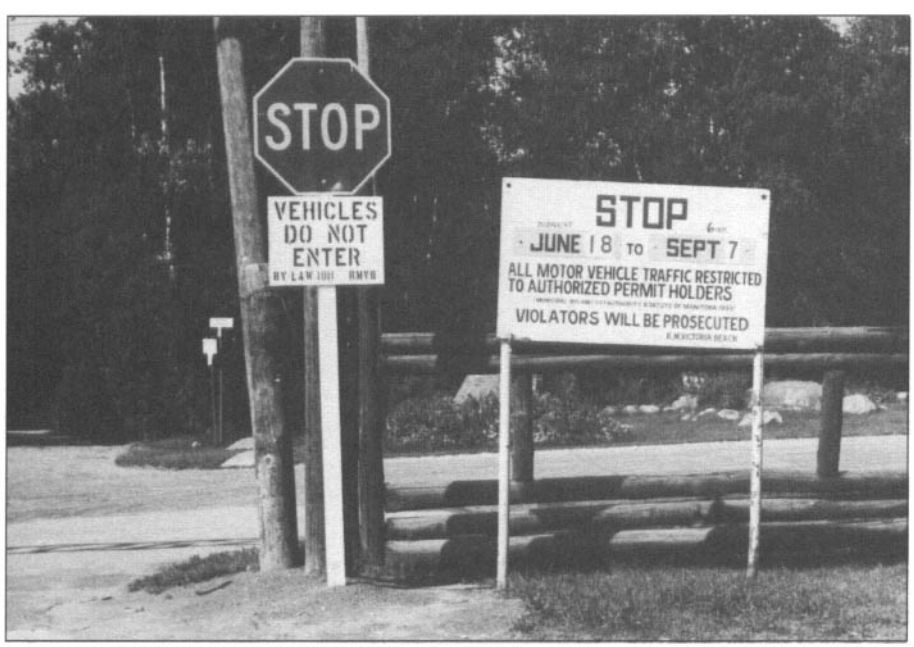

Figure 19.1.4 The Entrance to Victoria Beach Townsite (Photograph: J. Selwood)

to reach all but the most northerly resorts by the 1920s. Not until after World War II was the railways' hold on the beach communities broken. The prosperity of the postwar years and widespread automobile ownership eventually led to the decline and virtual demise of the formerly popular centres of mass entertainment at Winnipeg Beach and Grand Beach. But people did not abandon the lake, because growing affluence and improved road access made the purchase or rental of a vacation cottage possible for much of the populace.

The cottage communities around Lake Winnipeg have continued to grow in size and number, despite the wide range of other options available. New highway construction opened up the Whiteshell area for cottage development east of Winnipeg, while cheap air travel has brought the rest of North America and even more distant locations within easy reach. However, Winnipeggers, and to a lesser extent people from other communities, have retained their attachment to Lake Winnipeg.[4]

As in the past, Winnipeg Beach continues to attract people largely from the North End of Winnipeg. Eastern European and Jewish subcultures still cling to their earlier family links with the west side of the lake. Many of these people would have enjoyed their first waterside experiences at one of the children's camps on the western lakeshore,[5] and then graduated to a modest cottage that may still belong to the family.

Cottages of modest size also predominate at Grand Beach, originally designed and leased as campgrounds (Figure 19.1.2), and at Grand Marais, although these communities are preferred by families whose origins were in western Europe and Britain who reside mainly in Winnipeg's eastern and south-central suburbs. Albert Beach resort originated with the Roman Catholic, French Canadian community of St. Boniface, and still retains those connections.[6]

At Victoria Beach, the more spacious, higher-status cottage development is quite striking (Figure 19.1.3), and its character is reinforced by the recent, very extensive subdivisions that now dwarf the original townsite. Development at Victoria Beach has been subject to strict land-use controls, building restrictions, prohibitions on tree removal, a ban on automobiles, and at one time even the exclusion of Jews (Figure 19.1.4). Victoria Beach thus became the preserve of the "respectable" classes of Winnipeg, drawing on Crescentwood, River Heights, and East Kildonan for its patronage. Although some of the former restrictions have now been relaxed, Victoria Beach still enjoys a high level of natural attractiveness and premium property values.

Because cottage property is still very much in demand and the south basin of Lake Winnipeg is so convenient to Winnipeg, new lakeside subdivisions and communities continue to spring up around the lake. Some of these, such as Siglavik, just south of Gimli, have been designed in the marina style, with boat-canal access. During the last decade or so, these new subdivisions have

created a continuous strip of development along much of the lake's shoreline. Nevertheless, some of the original communities, such as Victoria Beach and Winnipeg Beach, are able to retain, regain, or even enhance their distinctive character.

NOTES

1. J.C. Lehr, H.J. Selwood, and R. Goatcher, "Wilderness Suburbias: Winnipeggers and Their Vacation Homes," *Bulletin of the Association of North Dakota Geographers* 34(1984):17–23.
2. H.J. Selwood, E. Badiuk, and J.C. Lehr, "Victoria Beach: Company Resort Town," *Bulletin of the Association of North Dakota Geographers* 33(1983):31–7.
3. J.C. Lehr, H.J. Selwood, and E. Badiuk, "Ethnicity, Religion and Class as Elements in the Evolution of Lake Winnipeg Resorts," *Canadian Geographer* 35, 1(1991):46–58.
4. Lehr, "Wilderness Suburbias."
5. J.C. Lehr, M. Schultz, and H.J. Selwood, "An Investment in Health: Children's Summer Camps in the Winnipeg Region," *Recreation Research Review* 10(1983):51–6.
6. Lehr, "Ethnicity, Religion and Class."

Case Study 19.2
The Seasonal Resort of Wasagaming, Riding Mountain National Park

Christoph Stadel

As early as World War I, Riding Mountain was considered one of the summer playgrounds of Manitoba. Although 91 percent of the 2,976 km² of Riding Mountain National Park are designated as "wilderness," a small section on the southern shore of Clear Lake forms the highly developed and utilized townsite of Wasagaming, equipped with a full range of visitor services and resort amenities. The combination of being a semi-urban tourist resort located in a national park and the strongly seasonal nature of its activities make Wasagaming a unique settlement in Canada.

The townsite of Wasagaming is located on the southeastern shore of Clear Lake, at the southern periphery of Riding Mountain National Park (Figure 19.2.1). It is easily reached from Brandon (95 km) and Dauphin (70 km) by Highway 10, and from Winnipeg (255 km) by the Trans-Canada and Yellowhead highways (Figure 11.2.1 on page 164). Although Wasagaming is readily accessible today, its origin as a resort town is not transportation-related but can be explained by the scenic and recreational qualities of lake and forest.

Wasagaming was founded before Riding Mountain National Park was established. In 1908 the first campers, from the Erickson district to the south, reached the southern shores of Clear Lake at a site that was later named Clark's Beach. In the summer of 1916, the first 17 lots were surveyed at Clark's Beach, and the first cottage was built in 1917. By 1926 there were 65 cottages and a hotel/store at the site.

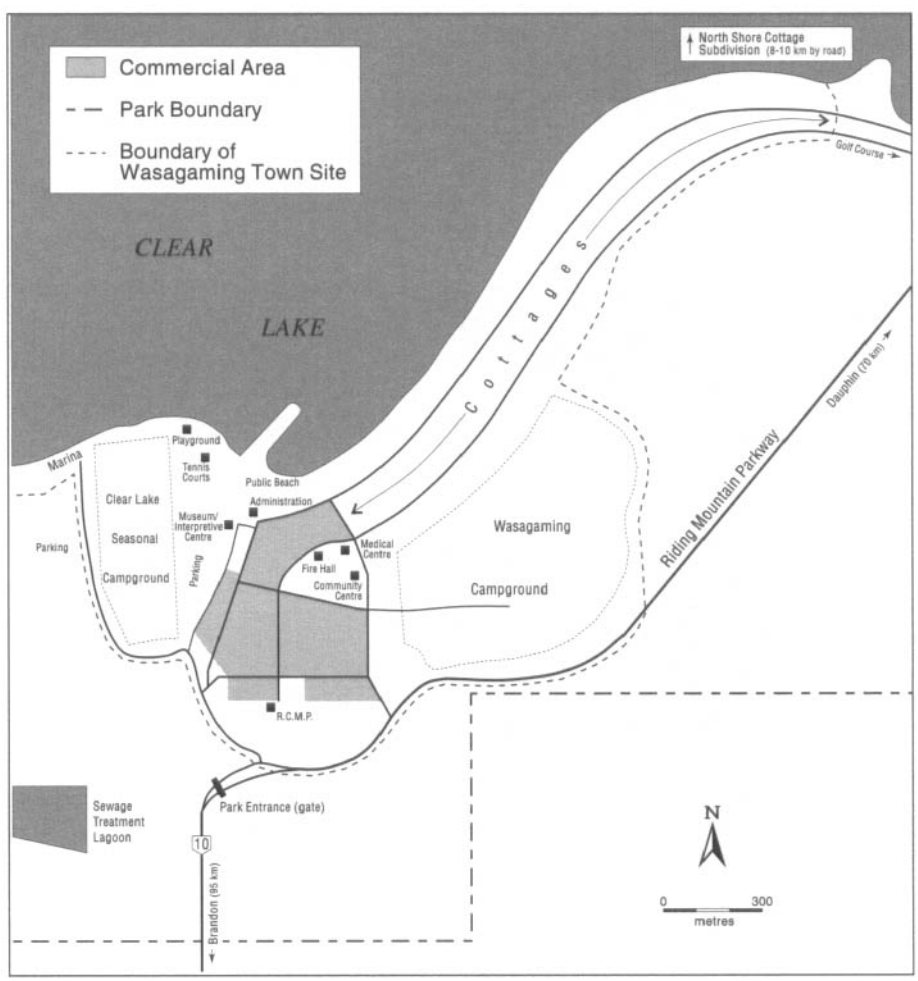

Figure 19.2.1 The Structure of the Community of Wasagaming

The Riding Mountain area, which had previously been a Dominion Forest Reserve, was declared a national park on 30 May 1930. The park officially opened on 26 July 1933. To attract visitors, a number of tourist and commercial facilities were established. In 1931 the townsite was officially surveyed, and new cottage sites were made available on a "first come, first served" basis. The 1931 development plan provided for a residential area of 24 blocks incorporating the former subdivisions, a business section, and a campground of nearly 300 sites.[1]

In the 1930s a number of administrative, tourist, and recreational facilities were constructed – a vital source of relief work during the difficult Depression years. The building style and woodwork of many

of the commercial and park buildings reflect the skills of Swedish craftsmen from the Erickson District.

After World War II, Wasagaming was affected by a number of factors, such as the increased mobility and affluence of a large segment of the population, who also had longer paid vacations. The development of Riding Mountain National Park was also affected by a change in the park's primary objective from serving as a summer "playground" to a more "conservation and wilderness" orientation, in an attempt to contain the impact of tourism. This change was reflected in an attempt to limit the expansion of commercial activities and tourist infrastructure in Wasagaming, and to "freeze" cabin and cottage development.

Despite this, a new, fully serviced campground was opened on the east side of Wasagaming in 1963, in response to a large increase in the popularity of camping in the 1950s and 1960s. During this period, the original campground evolved into the Clear Lake Seasonal Campground, with sites for cabins being held by the campers under yearly permits (Figure 19.2.1).

Visitors to Riding Mountain National Park, 76 percent of whom go to Wasagaming,[2] have increased substantially since the 1970s, and reached over 1.2 million people in the 1989–90 and 1990–91 seasons. Manitobans account for 85 percent, followed by people from Saskatchewan (7 percent). The number of visitors has fluctuated from year to year because of variable environmental conditions (weather, mosquitoes) and other factors (popularity of weekend shopping trips to the United States, other economic conditions, and variations in park regulations).

The peak period is from early July to about the middle of August, and also includes the long weekends in May (Victoria Day) and September (Labour Day).[3] Between these two long weekends, all park facilities and businesses are open, and Wasagaming is a bustling centre. At times its weekend population temporarily makes Wasagaming the third-largest settlement in Manitoba.

The character of Wasagaming as a seasonal resort is reflected in the structure and land use of the townsite, and by the fact that, with only a few exceptions, all the businesses are closed during the winter months. At the centre of the summer's activities is the commercial area, which clearly has a tourist orientation: a large section is occupied by hotels, motels, cabins, restaurants, gift shops, and clothing stores.

The Clear Lake Seasonal Campground and the Wasagaming Campground constitute the second major component of the settlement of Wasagaming. The former consists of a very dense grouping of seasonally opened cabins and trailers, whereas the latter offers over 500 serviced and unserviced lots for campers.

The third major element of the settlement is the prestigious and expensive area of seasonal cottages occupying land leased from the park. This area extends as a spine along the south shore of Clear Lake, and includes an additional subdivision along the north shore.

The fourth major land-use component consists of the National Parks services – the park administration building; visitor and interpretation services; the fire hall; the community centre; recreational facilities such as the tennis courts, playground, marina and public beach; and parking areas and a "green belt" surrounding the community (Figure 19.2.1).

The special character of Wasagaming is seen not only in the settlement structure and land use of the townsite but also in its administration, land and building regulations, and law enforcement structure. Wasagaming's administration falls under the authority of the federal Minister of the Environment, with the Superintendent of Riding Mountain National Park as his or her representative. Land and building regulations are within the National Parks mandate, and uphold the principle that land within the park is publicly owned. Thus the lots occupied within the townsite are leased on a perpetual and renewable basis to the commercial establishments and cottage residents. All municipal services and infrastructure are operated and maintained by the park. Law enforcement is provided by the Royal Canadian Mounted Police and park wardens, who are federal employees.

Management plans consistent with the National Parks mandate have been developed for Wasagaming and continue to evolve with increasing participation by stakeholders (businesspeople, residents, cottagers). The overall objective of the Wasagaming Community Plan is to "foster a vibrant, attractive park community where the natural environment and heritage buildings are recognized."[4]

This objective should be reflected in the overall appearance of Wasagaming: the landscaping, the building designs, and the range and quality of services offered to visitors. The community plan concept for Wasagaming advocates a "status quo" approach of containment, with modest renovation and redevelopment of facilities for the years to come. The double function of Wasagaming as a provincially significant seasonal resort and as a national park visitor centre will be maintained.

Future tasks and challenges for Wasagaming will be to harmonize commercial and national-park interests, to improve visitor facilities without impairing the environmental quality of the townsite, and to arrive at a more coordinated and integrated planning approach for the town and the fringe developments of the Local Government District of Park and the hamlet of Onanole, both of which are located directly south of Wasagaming and Riding Mountain National Park. These challenges will be addressed in the next few years with a proposed townsite-management study, as well as with the establishment of a Riding Mountain consultative committee that will include representatives of all stakeholder groups. In 1993 a two-day workshop was held in Brandon to consider the status and future of Clear Lake, and all interest groups were asked to participate.

Wasagaming shares an essentially summer-resort character with a number of other lake resorts in Manitoba, particularly those on Lake Winnipeg.[5] This seasonality results from the appeal of the lake, the tradition of Wasagaming as a summer resort, deficient infrastructure

and services for winter use, and National Parks policies that restrict permanent winter occupation of the townsite.

With winter outdoor recreation becoming increasingly popular, however, Riding Mountain National Park is enhancing its winter programs and facilities. For example, since the winter of 1991–92, ski trails illuminated at night have been developed within the Wasagaming townsite in an effort to encourage winter visits. It remains to be seen whether such initiatives will change the essentially summer nature of the town.

NOTES

1. G.A. McMorran, *The Story of Riding Mountain National Park* (Wasagaming: McMorran Agencies, 1959).
2. Environment Canada, *Riding Mountain National Park Management Plan* (Ottawa: Environment Canada, 1987).
3. Environment Canada, *Monthly Visitation Data* (Wasagaming: Environment Canada, 1991).
4. Environment Canada, *Wasagaming Community Plan* (Ottawa: Environment Canada, 1988), 3.
5. J.C. Lehr, H.J. Selwood, and E. Badiuk, "Ethnicity, Religion and Class as Elements in the Evolution of Lake Winnipeg Resorts," *The Canadian Geographer* 35, 1(1991):46–58.

Case Study 19.3
Museums: Scattered Remnants of People's Heritage

E. Leigh Syms

The term "museum" evokes many different images. Museums may be viewed as places that have interesting old things; dull, uninteresting things; and fascinating items that are unusual. They may be regarded as an educational experience, or as the source of a nostalgic trip down memory lane.[1] The 170 places throughout Manitoba that can be considered museums do provide highly varied experiences, but they have in common opportunities for visitors to see items and displays depicting the natural and human heritage of the province.

Museums range in size from private collections in the basement of a personal home to small buildings filled with items, such as Plum Coulee Museum; to complexes of several buildings, such as Trembowla Cross of Freedom Museum, north of Dauphin (Figure 19.3.1), and Chapman Museum, Rivers; to medium-sized regional museums, such as Swan Valley Museum; to the large provincial museum, the Manitoba Museum of Man and Nature.

Museums are found in old houses, such as the Pioneer Home Museum of Virden and District and the Daly House, Brandon; in railway stations, such as the Strathclair Museum in a former CPR station; in schools, such as the Antler River Historical Museum, Melita; in churches, such as the St. Elie Romanian Orthodox Church Museum, Inglis; or in other heritage buildings turned into numerous display rooms filled with a variety of items, such as the Waskada Museum, located in an early Royal Bank building and an Anglican church, and the Beautiful Plains County Court Building, Neepawa.

Figure 19.3.1 Trembowla Cross of Freedom Museum, Dauphin (Photograph: L. Syms)

Some are found in period homes, such as Dalnavert House in Winnipeg and the house at the Miniota Museum, while others are in special buildings and focus on a certain theme, such as the blacksmith shop in Cartwright, the long, ancient record of the Native peoples at Boissevain's Moncur Gallery, the Crystal City Printing Museum, and the Western Canada Aviation Museum in Winnipeg. Many vocations are represented by special displays set up by staff, volunteers, or retirees, such as the Winnipeg Police Museum, the Winnipeg Fire Service Museum, and the Manitoba Electrical Museum in Winnipeg.

A number of museums reflect the ethnic diversity of the province. Some, such as the Mennonite Heritage Village at Steinbach, the Ukrainian Cultural and Educational Centre in Winnipeg, St. Boniface Museum, and the Gimli Museum focus on specific groups in a community. Others reflect the cultural biases of the organizers of the museums. For example, western European cultures tend to be concerned about preserving their heritage in museums, a fact seen in many rural museums. Others — particularly minority groups such as rural Chinese, a wide assortment of urban immigrant groups, and Native peoples — are underrepresented in museum displays.

Museums also vary greatly in the areas or regions that they represent. The Mennonite Heritage Village in

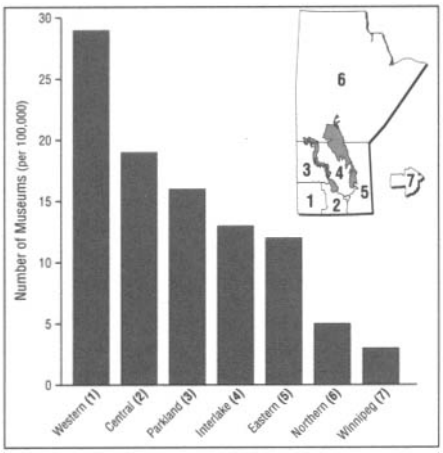

Figure 19.3.2 Density and Distribution of Museums in Manitoba

Steinbach and the Swan Valley Museum represent regions as well as particular themes. Others reflect local communities. Specialized museums (such as the Dugald Costume Museum, the finest costume museum in western Canada) and larger institutions (such as the Manitoba Museum of Man and Nature, which was awarded Michelin's international three-star rating), cover the whole province and beyond.

The distribution of museums throughout the province also reflects a British-Ontario propensity to develop museums. The province is divided into six museum regions, with most museums being found in areas of predominantly British heritage (Figure 19.3.2). Another factor may be the relative agricultural wealth of the regions.

The collections and exhibits in the museums range from highly organized thematic displays to eclectic collections of items donated by local people. Even those with primarily local objects are often treasure houses of unusual items, such as large gun collections or exotic items from distant lands brought back by travellers during the early years of this century, as at Treherne Museum; or rare photographs and poignant wartime letters, as at the Commonwealth Air Training Plan Museum at Brandon. Some museums, like the Manitoba Agricultural Museum at Austin, are associated with special festivals or seasonal activities such as threshing.

The museums of Manitoba are highly diverse and full of surprises, showing many examples of the technology, equipment, wildlife, and activities of the communities and regions in the province.[2]

NOTES

1. Comments and information provided by Mr. David McInnis of the Manitoba Historic Resources Branch are much appreciated.
2. For further information on locations and specialties, consult D. Ross, *Museums in Manitoba* (Winnipeg: Manitoba Museum of Man and Nature, 1974), the brochure of the Association of Manitoba Museums.

"TOUGH TO MAKE IT": THE HISTORY OF PROFESSIONAL TEAM SPORTS IN MANITOBA

20

Morris Mott

Geographers of sport have concentrated on a few important themes.[1] The relevant one for the purposes of this chapter is the spatial organization of competition among professional athletes. According to geographers, there are at present, and have been in the past, essentially two methods of arranging professional sports events.[2]

One is to organize a tour, to have athletes move from place to place to compete against each other. This method has been used traditionally in individual sports such as golf, tennis, track and field, bowling, and skiing; and occasionally also in team sports, by promoters of basketball and baseball, for example, and recently by promoters of curling in Canada and beach volleyball on the west coast of the United States.

The second method is to establish a league with member clubs or "franchises," each of which has a "home park" or "home stadium" in a particular town or city. In team sports, this is, and has been for over a century, the normal way of organizing professional competition.

A professional sports league may be defined as "a voluntary organization which provides an institutional structure within which contests among member teams can be arranged so as to determine a league champion for each season."[3] It is also a kind of cartel, or at least an agency through which member clubs can make joint decisions on matters of importance to all, such as rules by which matches will be played; rules about eligibility, allocation, and payment of players; arrangements for new franchises; and allocation of rights to broadcast games.[4]

On the subject of professional leagues, the work of geographers has reinforced and complemented studies by economists, historians, sociologists, legal scholars, journalists, and other students of the business of sports.[5] All have shown that teams in districts of low population density frequently have financial problems. This is partly because the potential number of spectators for matches is low, and partly because the large facility the sports team requires cannot be built because there is little chance that other groups will use it on off days.[6]

Geographers and other scholars have also noticed that, within a league, franchises in small centres are able to compete with franchises in large centres only when the league is strongly committed to revenue sharing and/or ceilings on expenditures. They have also found that travel costs are an important factor in the viability of professional clubs and leagues. Finally, they have shown that since World War II the "catchment" area or "fandom" region of particular clubs and leagues has been extended by electronic media, especially television; as a result, major leagues and their teams have prospered at the expense of minor leagues and their teams.

Geographers and other commentators have drawn these conclusions without much information from Manitoba, but the history of professional sports in the Keystone Province confirms their validity. Professional sports franchises in Manitoba have consistently had financial problems, and most have succumbed to them after only a few

years. Sometimes the financial problems have resulted from bad management or peculiar local difficulties, but always they have had something to do with geographic circumstances. Perhaps the travel costs for away games could not be met. Perhaps the community in which a franchise was located was too small and too poor to generate the revenue required by the team. Perhaps the people of a community were exposed through the media to games played by distant teams and became dissatisfied with the calibre of their own club. Generally several reasons, some of them geographic, can be cited for a franchise's vulnerability and demise.

PROFESSIONAL SPORTS IN SMALL CENTRES

Since 1870 agriculture and the resources of the Canadian Shield have been extremely important to the provincial economy.[7] The result has been that many Manitobans have lived on farms and more have lived in hamlets or villages such as Griswold or Letellier, in larger towns such as Russell or Killarney, or in small cities such as Flin Flon or Portage la Prairie.[8]

Occasionally people in such settlements, assisted by the farmers and other "rural" people who lived nearby, tried to operate a sports team composed completely or primarily of paid athletes. They did not do so for very long. Normally they were in leagues that also had franchises in Winnipeg and Brandon, Manitoba's two large centres. Small-centre franchises usually could not generate the revenue needed to pay for players of the same calibre as in larger centres, or perhaps the whole league died because one of the large centres obtained a franchise in a "higher" league.

Both problems were experienced by the Carman Cardinals baseball team, which played in the Manitoba-Dakota Baseball League (Man-Dak League) of the 1950s. The Carman team became part of the amateur Manitoba Senior Baseball League in 1949. In 1950 this team, along with two teams from Winnipeg, one from Brandon, and one from Minot, decided to form a professional circuit using mostly imported players. The teams were able to hire several excellent black players from the United States whose market value in their own country was artificially low; in the late 1940s Jackie Robinson had only lowered — not eliminated — the colour barrier that existed in professional baseball. The league and the Carman franchise did very well for a couple of years, but by 1952 the Carman owners were losing money and were calling for fewer imports and a limit on salaries. The clubs in the bigger centres did not agree until after the 1953 season, but by then it was too late.

The league was already vulnerable because in 1953 the Winnipeg Goldeyes had been formed. In 1954 the Goldeyes would begin playing out of the new Winnipeg Stadium in the superior-calibre Class C Northern League, which had franchises in cities in Minnesota, North Dakota, and other northern states. By this time there was only one Winnipeg team — the Royals — in the Man-Dak League, and the officers of the club knew that they would not be able to compete with the Goldeyes for support. The Royals dropped out of the Man-Dak League before the 1954 season; Carman and Brandon struggled through the year and then dropped out as well.[9]

Because teams composed completely or mainly of paid players have been too expensive for small centres to support, a common pattern since the 1880s has been for clubs to import one or two professional athletes and have them play with local amateurs. This kind of arrangement has also been made in the larger centres of Brandon and Winnipeg, but it has been more typical of smaller communities. The strategy has been used most extensively in baseball.

Imported baseball players have usually come from eastern Canada or the United States. They first appeared in the very early pioneer years, as early as 1878 in Winnipeg, but became very common in small centres only in the decade before World War I. Imports more or less disappeared during the war but reappeared in the 1920s, and were found occasionally even in the tough economic period of the 1930s. After World War II, many towns imported a player or two, and the practice is common to this day, especially in the western part of the province.[10]

One of the most interesting experiments in hiring professional baseball players for a team in a small town occurred in Virden in 1929–30. By the mid-'20s the Virden senior baseball team was managed by a CPR telegrapher named Harry Allen and bankrolled by several businessmen, especially hardware store owner W.A. Bridgett. Early in 1927, Bridgett and Allen decided to import a couple of players and field a higher-calibre team than Virden had had for many years. They decided also that Virden should host a big tournament, as other western Canadian towns and cities were doing, to advertise the town and enable people from Virden and district to see the best teams in North Dakota, Montana, Saskatchewan, and Manitoba.

The tournament was a huge success. Over 7,000 people (Virden's population at the time was about 1,500) watched some excellent baseball on a beautiful, sunny day. The next year (1928) a similar tournament was held, and it was just as successful.

By 1929 the Virden tournament was well known throughout the Canadian Prairies and the northern Great Plains of the United States. However, Virden's team was not good enough to beat the top clubs that played in it, so Bridgett and Allen decided to import two of the finest players that Bridgett's money could buy — Oscar "Hap" Felsch and Charles "Swede" Risberg.

Both had been members of the infamous 1919 Chicago White Sox team that "threw" the World Series to the Cincinnati Reds. The "crime" of the "Black Sox" was discovered late in 1920, and Felsch and Risberg were among eight players banned from organized baseball. For the next few years they played for various towns and cities in the northern United States and western Canada. In 1929 Harry Allen convinced them to join the Virden

club, and Felsch returned for the 1930 season.

The Virden team played in a league with Brandon and Moosomin, and in tournaments in Plentywood, Brandon, Regina, Winnipeg, Treherne, and other communities. At these tournaments, Virden would compete against local teams fortified by imports. They would often play against one of the black teams barnstorming through the region, especially the very fine team known as Gilkerson's Colored Giants; or they might meet the white barnstorming team sponsored by the House of David, an obscure religious sect with headquarters in Benton, Michigan. If they won the tournament, they would take home $500 or $600, enough to pay Felsch for a month. If they finished second, which they usually did if they met the Colored Giants in the final game, they would earn $300 or $400, approximately Risberg's monthly salary.

Bridgett and his associates made a small profit on the Virden team in 1927 and 1928, and broke even in 1929. In 1930, however, the club lost about $3,000. With grain prices falling and some farmers already harmed by drought, the backers of the team decided not to hire Felsch or anyone else in 1931. The era of the imported professional in Virden was over for a while.[11]

PROFESSIONAL SPORTS IN WINNIPEG AND BRANDON

Over the decades, most Manitobans have lived on farms or in small urban communities, but a significant number — in recent years the majority — have lived either in Brandon, Manitoba's second-largest city since the early 1880s, or in Winnipeg, the province's biggest centre.

Brandon and Winnipeg have been the only centres in Manitoba large enough to support for a significant length of time teams composed completely or primarily of paid players. But these teams have almost always had financial problems, often stemming from what may be broadly defined as "geographical" reasons.

The first reason is that, although Brandon and Winnipeg have been large centres by Manitoban standards, they have not been large by Canadian or especially North American standards. The western interior of Canada, of which Manitoba is a part, has never been as densely populated as several other regions in North America, and the major cities in the western interior have not been as large as major cities elsewhere. Thus the revenue potential for professional sports franchises has been lower in the Manitoban cities than in many others.

Second, Winnipeg and Brandon are far from other major centres. Traditionally, it has been difficult for Winnipeggers and Brandonites to be part of urban "networks." Winnipeg is over 1,200 km from Calgary or Edmonton; over 1,500 km from Chicago, Denver, and St. Louis; about 2,000 km from Toronto and more than that from Vancouver; about 2,500 km from Montreal; and well over 3,000 km from New York, Boston, and Los Angeles. The nearest major city is the "twin cities" of Minneapolis–St. Paul, over 700 km away.

The distances are slightly different for Brandon, but the point is that these two major Manitoba cities are comparatively isolated from most of urban North America. This means, of course, that most professional sports franchises have had to absorb high travel costs.

The history of pro franchises in Winnipeg and Brandon reveals that disadvantageous geographical circumstances have worked with other factors to cause financial difficulties. This history can be divided into three periods: from the 1880s to World War I, from World War I to the late 1950s, and from the late 1950s to the present.

The 1880s to World War I

The first professional sports league in Manitoba was the Manitoba Baseball League of 1886, which lasted only one year. Initially there were three Winnipeg teams and one Portage la Prairie team, but the Portage team soon dropped out because it could not pay the salaries that the other teams were offering. The three Winnipeg clubs played a schedule that ran from the end of May until the beginning of September. The early games were very well received. In a mid-season match, however, some of the umpire's decisions seemed influenced by his knowledge of bets on the outcome. In later games some of the professional players did not play their best; and in one game, a pro made an unflattering gesture towards the fans. The spectators became alienated. By the end of the season, the crowds were only half as large as at the beginning. All three clubs lost money, and the *Manitoba Sun* correctly predicted that the league would not operate the next summer.[12]

The first pro league in a sport other than baseball was the Manitoba Professional Hockey League, which lasted from 1907 to 1909. The league began the 1907–08 season in December with five teams — two from Winnipeg and one each from Kenora (Ontario), Portage la Prairie, and Brandon. By the second week of January, the Kenora and Brandon clubs had folded. The other three clubs carried on, but already many hockey fans had become disgusted with the organization.

Their disgust originated with a game in December in which several players had been injured. The man most responsible was "Bad" Joe Hall, who was just gaining the reputation he would enjoy for the next dozen years as one of the toughest and most volatile players in pro hockey. In this game he whacked a player on the head with his stick. He was barred from the league for the rest of the year, but — in an indication of the untidy state of pro hockey at the time — he simply packed his bags, jumped on a train, and joined a pro team in Montreal a few days later.[13]

There were several other violent games in the inaugural season of the Manitoba Professional Hockey League. For many spectators the actions of the team owners were just as distasteful as those of the players. In February the owner of one of the Winnipeg clubs, the Strathconas, realizing his team would finish last, sold his best players to the owner of the other Winnipeg franchise, the Maple Leafs.

While doing so, he mentioned that he had turned down an offer of "financial assistance" from the owners of the Portage club that would have enabled him to complete the season. For their part, the Portage owners had tried to make sure Winnipeg had two mediocre teams rather than one strong one.

By the end of the year, hockey fans in Manitoba were disgusted with the professional league, and few were disappointed when the eventual champions of the circuit, the Maple Leafs, failed to take the Stanley Cup from the Montreal Wanderers. In the next season, 1908–09, the league began with three Winnipeg clubs. All were losing money when the owners agreed to terminate operations late in January.[14]

These early Manitoba professional leagues had problems similar to those experienced by many pro leagues in North America in the late 19th and early 20th centuries. As a result of violent play and the unpleasant personalities of players and owners, fans were suspicious of pro sport, and some refused to patronize it. They were influenced by ideas that originated primarily with people associated with English public schools, and that were articulated in Canada mainly by clergymen, educators, civil servants, and some journalists.

Professional sports were a "debased" form of sport in their view. For one thing, the participants made a living out of activities that were supposed to be diversions. For another, in pro sports the athletes played for money, not trophies or medals. To receive their money, the athletes would do anything — deliberately attempt to injure opponents, break the rules whenever they could get away with it, perhaps even lose on purpose.[15]

Dedicated amateurs in Manitoba and elsewhere in Canada were so convinced of the evils of professionalism that they wanted to penalize young men who became professional athletes, and wanted to make it very difficult for professionals to "contaminate" amateurs by playing with or against them. Thus the officers of amateur sports associations generally adhered to very strict definitions of an amateur, usually the one followed by the Amateur Athletic Association of Canada.

This organization was founded in 1884, and later became the Canadian Amateur Athletic Union and then the Amateur Athletic Union of Canada. In 1902 the definition professionalized anyone who had ever received a salary or "any money considerations whatever" except travel expenses for playing a sport, who had ever sold or pledged prizes won through sports, who had ever "promoted an athletic competition for personal gain" or "assisted in the practice of athletic exercises as a means of obtaining a livelihood," who had ever competed under an assumed name, or who had ever played "with or against" a professional "in any sport for any prize."[16]

By World War I, several Manitobans had concluded that these rules were too strict. But the vast majority of them had suspicions about the legitimacy of pro sports. These suspicions cut into the revenue of pro clubs in Manitoba, and also discouraged many fine local athletes from joining professional ranks.

Another problem faced by the operators of Manitoba's pro teams was the cost of travel. The Brandon Angels professional baseball club played in the Northern League with teams from Winnipeg and several American cities in 1908, then in the Western Canada Professional League from 1909 through 1911. The team never broke even. In the final campaign, expenses exceeded revenues by almost $10,000, and it was concluded that the only league in which a Brandon club could afford to participate was one with franchises in nearby towns and cities — certainly not in Calgary and Edmonton.[17] The Winnipeg Maroons professional baseball team operated from 1902 to 1917. It played in the Western Canada Professional League with the Brandon Angels in 1909–11, losing money largely because of travel expenses. It did better in other years in the Northern League and the Northern Copper Country League, which normally had franchises in Grand Forks and Fargo, North Dakota; Duluth, Minnesota; Superior, Wisconsin; Houghton, Michigan; and perhaps other centres in one of the northern states. But even when the Maroons played in these leagues, their existence seemed in jeopardy.[18] Finally, travel costs also hurt the pro lacrosse team that operated precariously in Winnipeg from 1909 through 1911.[19]

In the years before World War I, then, it became evident that running a professional sports team in Manitoba was not going to be easy. Already, superior athletes were leaving the province to take advantage of the high salaries they could earn from stable pro franchises in cities in central Canada, on the Pacific coast, or around the Great Lakes. They might be soccer, baseball, or lacrosse players, but primarily they were hockey players. Just before World War I there emerged two major professional hockey leagues. The first was the National Hockey Association, which became the National Hockey League (NHL) and which had franchises in Ontario and Quebec. The second was the Pacific Coast Hockey League, with franchises in British Columbia and later in Oregon and Washington. Every fall the best Manitoban players joined one of the major-league clubs. By the 1960s Manitoba had produced more major-league players per capita than any province except Saskatchewan, but no major-league clubs had been based in the Keystone Province.[20]

World War I to the Late 1950s

From World War I to the 1950s, professional sports franchises operated in a more favourable environment than the prewar clubs had enjoyed. Before the war many Manitobans, especially businessmen but also some journalists, had identified important weaknesses in the arguments against pro sports. They noticed that although professional athletes were sometimes rowdy, violent, and willing to "fix" games, they could be identified mainly by their excellence. Why shouldn't they be rewarded for their abilities in the same way gifted singers or actors were? Why should the owners of clubs and stadiums be the only ones

to benefit from the gate receipts generated by high-calibre sports events?[21] These were questions that dedicated amateurs could not answer satisfactorily.

Moreover, enforcement of the Canadian Amateur Athletic Union's strict amateur rules led to situations that many people regarded as absurd or unfair. Winners of three-legged races or potato races at country fairs had to worry that they might become "professionalized" by accepting a dollar or even a quarter. Working-class athletes were not allowed compensation from their clubs for the time lost from work when they played games away from home. Young men who wanted to test their skills against professionals in one sport had to worry about being disqualified from amateur competition in virtually every sport, even the ones in which they had no great ability. Finally, people who had been labelled professional had to go through long, uncertain processes of "reinstatement" to amateur ranks.[22]

In the interwar years more and more athletes simply ignored the unsatisfactory rules of the Amateur Athletic Union of Canada and its Manitoba branch, the Manitoba Amateur Athletic Association. Every summer they played with or against professional athletes who had never been reinstated as amateurs — "Hap" Felsch, for example, or recent immigrants from the United Kingdom who had played pro soccer in the old country. Every winter they accepted money, either openly or secretly, for the time off work they needed to play hockey. In the 1930s in particular they accepted jobs, perhaps as miners in Flin Flon or as auto salesmen or clerks in many places — jobs offered to them primarily because they were skilled at a sport.

Spectators rarely complained. The dedicated amateurs were out of touch with the tough economic realities of the interwar years. By the 1950s their organizations still existed, but when they insisted on their strict amateur rules, they were ignored.[23]

The Winnipeg Blue Bombers

The sports club that benefited most from the more receptive attitude towards professionalism was the Winnipeg Blue Bombers football club. This club's sport was the rugby style of football that had been played in Manitoba since the earliest days of settlement, but only infrequently outside Winnipeg. Since the 1880s a Winnipeg champion had been recognized, and after 1911 the best club in the city played for a championship of western Canada organized by the new Western Canada Rugby Football Union.

Two very important developments occurred in the 1920s. First, in 1921 the best western team, which sometimes was a Winnipeg team, became eligible to play for the Grey Cup, donated in 1909 by the Governor General of Canada for competition among the best teams in the Dominion. Second, as they had begun to do before the war, teams and leagues in Winnipeg and the west adopted more and more of the recent American adjustments to the late-19th-century game of rugby. This meant fewer players on the field, more interference or "blocking" for the ball carrier, a "snap back" rather than "heel out" system of putting the ball into play, the use of the "huddle," and finally, in the late '20s and early '30s, the adoption of the forward pass.

The use of American rules stimulated the practice of importing American players. Early in the 1930s two Winnipeg organizations, the St. John's Club and the Winnipeg Football Club, brought in Americans to strengthen their teams. Officially, the imports were amateurs. Actually, they were professionals, but no one cared very much.

In 1933 the St. John's Club folded and the Winnipeg Football Club became the only club in Manitoba with imports. It needed them, not to compete with the two other teams in Manitoba but to compete with the best teams in Saskatchewan, Alberta, and central Canada, most of whom were using two or three imports each by this time.

In 1935 the Winnipeg Football Club dramatically escalated the practice of bringing in imports, and it paid off. The club fielded a team with nine Americans, the most important of whom were Fritz Hanson, halfback, who was paid about $150 a game, and Bob Fritz, quarterback and coach, who made approximately $900 for the season. Hanson and Fritz led the club, which in that season began to be called the Blue Bombers,[24] to the first Grey Cup victory by a team from the west.

By this time, football was growing in popularity across the Prairies, and in 1936 the top clubs formed a league, the Western Interprovincial Football Union (WIFU), in order to arrange a full schedule of matches, not just playoff games between champions of different provinces. The Blue Bombers continued bringing in imports and paying them; so did the clubs in Regina, Calgary, and Edmonton (which joined the league in 1938).

During World War II the practice stopped; in fact the WIFU ceased operations and the Winnipeg Football Club became the "RCAF Bombers." After the war, however, civilian clubs were reorganized, American imports began to be used again, and football quickly regained its following. By the late '40s it was obvious that more people in Winnipeg wanted to watch Bombers games than could be accommodated in Osborne Stadium, which had a capacity of about 6,000.

The 1950s proved to be the golden decade for the Winnipeg Blue Bombers and all the teams in the WIFU (including the B.C. Lions, formed in 1954), as well as for the Montreal, Toronto, Hamilton, and Ottawa teams that made up the Interprovincial Rugby Union (the "Big Four"). All these teams became fully professionalized, but Canadian players received small salaries compared with the outstanding Americans on their clubs.

The Americans were available because the All-American Conference, which had been formed in the United States in 1946, ceased operations in 1949. Three of its teams were absorbed into the more established National Football League (founded in the early '20s), but the demand for football players diminished and so did their salaries.

Some truly marvellous American

players saw action in Canada in the next few years. Among them were linemen such as Martin Ruby (of the Saskatchewan, formerly Regina, Roughriders), Kaye Vaughan (Ottawa), and Tex Coulter (Montreal); ends such as Hal Patterson, Red O'Quinn (both in Montreal), and Bob Shaw (Calgary); backfielders such as Billy Vessels, Rollie Miles, and the remarkable Jackie Parker (all in Edmonton); and quarterbacks such as Glenn Dobbs and then Frank Tripucka (both in Saskatchewan), Sam Etcheverry (in Montreal), and Bernie Faloney (in Edmonton and then Hamilton).

Winnipeg signed their share of quality American players — linemen Buddy Tinsley and Dick Huffman, ends Neill Armstrong and Bud Grant, backfielder Tom Casey, and quarterback Indian Jack Jacobs, perhaps the most famous Blue Bomber in history. Like the other Americans mentioned, Jacobs was a terrific two-way player, leading his team to Grey Cup appearances in 1950 and 1953. Winnipeg fans thought that he and the Bombers were wonderful, and beginning in 1953 they could watch them play in the new Winnipeg Stadium, "the house that Jack built," which held three times as many people as old Osborne Stadium.[25]

In the late 1950s the Winnipeg Blue Bombers, like other professional football teams in Canada, were very healthy financially. It seemed that they might do even better in years to come, because they had just begun to make money from a promising source of income — television. As we shall see, however, between the early 1960s and the early 1990s, television was the main reason that the Blue Bombers and all Canadian professional football clubs nearly died.

From World War I to the late 1950s, there were several professional clubs other than the Blue Bombers in Manitoba's two main cities. All played baseball or hockey, and none did particularly well financially, mostly because of geographic factors.

Baseball

In 1919 the Winnipeg Maroons were reestablished (they had ceased to operate in 1917) and joined a western Canadian league with teams from Edmonton, Calgary, Saskatoon, Regina, and Moose Jaw. By the end of the 1921 season, Regina and Moose Jaw were out of the league, and the Maroons folded because of the long and expensive trips the team now had to make.[26]

At the beginning of 1933 a reorganized Maroons team joined the Northern League, with franchises in cities in North Dakota, Minnesota, and Wisconsin. About a third of the way through the season, the faltering Brainerd, Minnesota, franchise was moved to Brandon. The Brandon Greys almost won the championship in 1933 but just barely made money, so the owner, a Minnesotan named Ray J. Mergens, decided to move his franchise back to Brainerd (in combination with Little Falls), where he obtained better terms for renting the stadium. The Winnipeg Maroons, owned by Bruno Haas of Fargo until 1940, and then by a group of Winnipeg businessmen, stayed in operation until the end of the 1942 season. The club folded mainly because it was difficult to obtain American players after the United States entered World War II.[27]

As noted earlier, the Winnipeg and Brandon clubs in the Man-Dak League did very well from 1950 through 1952, then floundered for two years before dying. The Brandon Greys reentered the league in 1957, but quickly lost $14,000 and ceased to operate.[28]

Meanwhile, in 1954 the Winnipeg Goldeyes had begun playing in the Class C Northern League. They struggled financially for two years before the original owner, a Winnipegger named Mark Danzker, who had his hand in many businesses and projects, sold the club to a group of local businessmen with more time and energy to operate it. By 1959 they were doing very well. Already, however, the Goldeyes, like all minor-league baseball teams, were being adversely affected by the most important new factor in the business of sports — television.[29]

Hockey

The only pro hockey team in Manitoba in the interwar period was the Winnipeg Maroons club that played from 1926 to 1928 in a minor league called the American Association. The league also had franchises in Minneapolis, St. Paul, Duluth, Chicago (briefly), Detroit (briefly), and Kansas City (in 1927–28). After the second season, Maroons owner W.J. Holmes decided to terminate operations. He received a good price for rights to his players from new minor-league teams just starting up on the west coast. More important, the other owners in the American Association were receptive to the idea of expansion to the south — into St. Louis, Tulsa, even Dallas — which meant that the Maroons' travel costs would escalate.[30]

After 1928, pro hockey did not return to Manitoba until 1955, when teams in both Brandon and Winnipeg became part of a minor league called the Western Hockey League (WHL). The league had begun as an amateur league that became a professional circuit in 1948 with teams on the west coast, and had expanded early in the 1950s into Edmonton, Calgary, and Saskatoon. In 1955 franchises were awarded in Winnipeg and Regina. The Regina Regals quickly became a financial disaster, however, and at Christmas owner Jim Piggott, a wealthy Saskatoon construction company owner, moved them to Brandon.

The Brandon Regals played the last half of the 1955–56 season before respectable crowds, and on the Brandon portion of the year Piggott broke even. In 1956–57 the Regals had an excellent team, and won the WHL championship. However, they lost about $25,000 and had the lowest total attendance in the league. Piggott decided that Brandon, or at least the old Wheat City Arena, which had been built before World War I, was too small to generate the revenue required by a club that travelled all the way to the west coast. In the summer of 1957 Piggott moved the team to his home city of Saskatoon, where no WHL team had operated in 1956–57.[31]

By this time the Winnipeg Warriors had been playing for two seasons. In 1955–56 they won the WHL championship and went on to defeat the Montreal Royals for the Edinburgh Cup, a trophy for which

champions of the WHL and the Quebec Pro League competed from 1954 through 1957. Moreover, the team attracted huge crowds by WHL standards. The home opener was the first game ever played in the new Winnipeg Arena, built right beside the Winnipeg Stadium. It drew 9,671 fans, at the time the largest crowd ever to see a game in western Canada. Over the year the average attendance was close to 6,000 per game, about 2,000 more than the average for other teams. The owners of the club, J.D. Perrin Sr., a wealthy mining entrepreneur, and his son, J.D. "Jack" Perrin Jr., who was also vice president and general manager, made a profit of perhaps $75,000.[32]

But the second year saw a complete turnaround. The Warriors were the worst team in the league and the Perrins lost $40,000 to $50,000. Jack Perrin quickly made some decisions that improved the quality of the team,[33] but the franchise never regained its health. The main reason was competition from televised NHL games. The Warriors were the first professional sports team in Manitoba — but certainly not the last — to come to grips with the fact that television had changed the economics of pro sports forever.

Late 1950s to Early 1990s

From the late 1950s to the early 1990s, the owners of pro sports teams in Brandon and Winnipeg operated under conditions very different from those of earlier periods. Most of the changes made owning a franchise easier and more profitable. The most important change did not.

The most important change was television. In Canada, the Canadian Broadcasting Corporation (CBC) began televising in 1952, and in 1961 CTV became the first network of privately owned stations. Both networks quickly discovered what the American networks had learned back in the late '40s and early '50s: sports events were usually easy and inexpensive to broadcast, and they were popular with both viewers and advertisers. As a result more and more time was allotted to sports. On the CBC English network, for example, about 4 hours per week (9 percent of broadcast hours) were devoted to the "sports and outdoors" category in 1957–58, but the amount rose to 10 hours (13 percent) by 1974–75. Many Canadians wanted still more. They arranged to have their homes served by cable companies so they could watch sports on the major American networks. After 1979 they could receive ESPN, the American all-sports cable network, and after 1984 they could receive TSN, the Canadian version of ESPN.[34]

Television changed sports in a number of ways, three of which are most important for this discussion. First, it provided significant sums of money to teams and leagues. In return the networks wanted games that appealed to people not just in a small region but across a country or even the continent, so the second impact of television was the expansion of major leagues. The third consequence was that minor-league franchises dwindled in number and prestige. Major-league teams not only increased in number but also enlarged their regular "catchment" areas. For decades they might have been followed on radio or through newspapers by people who rarely or perhaps never saw a big-league match in person. The distant fan could now watch the major-league games, not just hear them or read about them. Moreover, especially as the technology of television broadcasting evolved, as the networks adopted instant replays, slow-motion replays, colour, "isolation" cameras, and other innovations, fans might well believe that they could see the games better in their living rooms than at the stadium. All this meant that fans were less likely than before to attend the lower-calibre minor-league contests.

Other developments benefited not only major-league but also minor-league professional teams. One was the near-total public acceptance of professional sport as a legitimate business and a legitimate source of income. Professional athletes were now defined almost completely by their excellence, not by the fact that they accepted money. This is the main reason no one seriously considered labelling as "professionals" the senior hockey, soccer, or baseball players who received a few dollars each game, or the college athletes who received scholarships or financial awards. These competitors would have been "professionalized" at one time, but now they were not because they were not viewed as the best, or even close to the best, in their respective sports.

One indicator of the public acceptance of professional sport is that from the mid-'60s on, professional games could be played on Sundays. From the pioneer years until the 1960s, professional and amateur sports clubs in Manitoba were not allowed to use Sunday for games to which admission was charged. Amateur clubs, especially in non-British Protestant communities, often avoided the penalties for breaking the Lord's Day regulations by organizing games at which hats were passed around and the fans made "voluntary" contributions. Operators of pro clubs did not do this — they knew that the revenue from passing the hat would be lower than from regular gate admission; they also knew that many spectators were opposed to commercialized leisure activities on Sundays.

After World War II, however, Manitobans, like other Canadians, became impatient with restrictions on Sunday activities. In 1960 Manitoba's legislature gave municipalities authority to allow amateur clubs to charge admission to Sunday games, and in 1964 it gave municipalities permission to extend the privilege to pro clubs. Most municipalities quickly did what was necessary to accommodate the clubs in their own jurisdiction. This had a positive impact on total attendance. It also made it much easier for officers of pro leagues to arrange schedules, because now they were working with three-day rather than two-day weekends.[35]

The availability of jet planes was another positive development for pro teams after the 1950s. In the 1940s and early 1950s, teams had occasionally used air transportation, but they did not trust the propeller-driven planes to arrive safely and on time.[36] By the late '50s, however, the jet plane seemed as reliable as the train, car, or bus, and of

course it was much faster. Transcontinental leagues were now possible. Soon the demands of network television would make them necessary.

Finally, in the 1960s corporations began to associate themselves with sports teams more directly than before. In 1983 the respected American author David Halberstam noted that in the 1960s sports became "more brazenly commercial" than before, and in the decades that followed, in Canada as well as in the United States, breweries, soft-drink companies, petroleum companies, restaurants, and other enterprises became willing to "help" pro teams. The help might take the form of an outright donation; normally, however, it came as a payment for the right to advertise on broadcasts of games or as the purchase of a block of tickets. In return, the company might receive the exclusive right to sell beer or soft drinks or food at home games, or the right to market luggage or calendars or other items on which the logos of both the team and the company were prominent. Thus the team would make money and the business would receive valuable publicity through association with the club.[37]

The first Manitoba team influenced directly by the new realities was the Winnipeg Warriors hockey club. As mentioned earlier, the Warriors had a great first year but a terrible second, and co-owner Jack Perrin made changes that he hoped would make the franchise more successful. However, the team lasted only four more years, and by the time it folded in 1961, the Perrins had lost an estimated $200,000 on their hockey operations.[38]

The Warriors were not viable for many reasons, and a full account of the club's demise is found elsewhere.[39] The major problem was television. Most Canadian households obtained a television set between 1952 and 1960. At the time the only signal most of these sets received came from a CBC-owned or affiliated station. Almost from the CBC's beginning days, one of its most popular programs was *Hockey Night in Canada,* featuring the Saturday night home game of either the Toronto Maple Leafs or the Montreal Canadiens. From 1952 to 1956 live broadcasts were seen only in Ontario and Quebec, but in the winter of 1956–57 they were seen in Winnipeg also. By the end of 1950s they could be seen by nearly every Canadian.[40]

Television hurt minor pro hockey franchises all over Canada.[41] The clubs could not draw fans on Saturday nights. This loss had an unusually strong impact on the Winnipeg Warriors for two related reasons. First, especially after 1959, the Winnipeg franchise was geographically remote from other teams in its league. The Brandon Regals had moved to Saskatoon in 1957, but partly because of televised NHL hockey, the Saskatoon club lost money. After two years, owner Jim Piggott took the team to Victoria, and eventually to Los Angeles. Once Saskatoon was out of the Western Hockey League, the Winnipeg franchise was over 1,200 km from the *nearest* team in the league. Travel costs became nearly prohibitive for both the Warriors and the west-coast teams coming to Winnipeg.[42]

The second reason that the loss of Saturday night hurt the Warriors so badly was that the club could not yet play on Sundays. They had never been able to do so, of course, but this presented no major problem until television took away Saturday night and the Saskatoon franchise moved. Now the WHL had to use at least one weeknight and possibly two for back-to-back Warrior home games against the same opponent.

This was not an attractive situation, but there was no alternative, given the travel costs for a team going to Winnipeg. By using a legislative loophole, Jack Perrin managed to schedule a few Sunday afternoon home games in 1959–60, which drew excellent crowds. In 1960, however, the Manitoba legislature closed the loophole, and in 1960–61 it was no longer possible to play on the Sabbath. The Warriors had their worst year at the box office. In the summer of 1961 the team took a leave of absence from the WHL, which in effect meant that the Warriors had ceased to operate.[43]

Another club that operated under the new conditions prevailing after the late 1950s was the Winnipeg Goldeyes baseball club. It has been noted that the Goldeyes became a healthy franchise after being bought by a new group of owners in 1956. In 1958 the club and the whole Northern League became Class A rather than Class C, partly because the Goldeyes and the league were doing well, but mostly because television was destroying the minor leagues. In 1949, just at the beginning of the seven- or eight-year period in which most American households acquired a TV set, about 42 million fans attended games played by minor-league teams in the United States. Only about 15 million did so in 1957, however, and the number fell to about 10 million in 1969. Minor leagues and their clubs folded after every season in the late 1950s. The ones that remained, like the Winnipeg Goldeyes and their Northern League, often moved up in classification. They also required a lot more financial help from major-league "parent" clubs (the St. Louis Cardinals in the case of the Goldeyes).[44]

By the early 1960s the Goldeyes were breaking even, but general manager Terry Hind, who was also a shareholder, was becoming restless. He was making a good deal less money as general manager of the Goldeyes than his administrative abilities were worth to other companies in Winnipeg. In 1964 he told his partners that he wanted to move on to something new. The partners concluded that while the Goldeyes had brought them a lot of enjoyment and satisfaction, they did not have the time or the energy to pick up the slack after Hind's departure. They decided to sell the team.

No one bought the club, even though it could have been purchased for $1. The Northern League was vulnerable by the mid-1960s. Very few of the franchises could count on having an agreement with a major-league team. Moreover, the clubs located closest to Winnipeg — those in Grand Forks and Fargo-Moorehead — had specific problems that made them unlikely to operate in 1965. Terry Hind recalls that those who were interested in acquiring the Goldeyes could see that

it was going to be "tough to make it" in whatever Northern League existed, so the club took a leave of absence from the league. In 1969 a Goldeyes team under new ownership returned to the Class A Northern League as a farm team of the Montreal Expos. A year later, however, the franchise was moved to Watertown, South Dakota, to make way for the Class AAA Winnipeg Whips (Case Study 20.1 on page 315).[45]

The Winnipeg Blue Bombers did not fold, but early in the 1990s there were serious doubts that the team and the league in which it played would survive. In the late '50s the future had seemed bright. The Bombers and other pro football clubs in Canada were making money. They had reason to believe that as television revenues became more important, they would make even more money. Indeed, the eastern and western leagues joined to form the Canadian Football League (CFL) in 1958 in order to facilitate an interlocking schedule (initiated in 1961) and to appoint one commissioner or spokesman — innovations that would make pro football more attractive to television producers.

However, beginning in the 1960s and then especially in the 1970s and 1980s, the Bombers and other CFL teams experienced financial difficulties. The main problem was escalating salaries, due mainly to the fact that good American players could demand such high wages in their own country.

Salaries went up in the United States partly because the well-established National Football League (NFL) periodically had to compete for players with new, independent leagues — the American Football League in the early and mid-1960s (which later merged with the NFL), the World Football League in the mid-1970s (which folded), and the United States Football League in the mid-1980s (which folded too). But the main factor was television.

In 1960 the NFL chose Pete Rozelle as commissioner. Rozelle knew very little about football on the field, but he knew a lot about marketing it. He especially knew that television held great possibilities for his league. One of his first tasks was to join other leaders in the American pro sports industry in lobbying Congress to allow teams in a league to operate as one economic unit when negotiating broadcast rights. They succeeded, and in 1961 President John F. Kennedy signed the Sports Broadcasting Act, which gave Rozelle and the others all they wanted. In 1964 Rozelle negotiated a TV package that gave each NFL team owner over $1 million a year. This was about three times what they had been making in the early '60s, and they were very satisfied.

But Rozelle soon gave them much, much more. By 1970 they were making nearly twice as much from television as in 1964, and by 1977 about six times as much. In 1982 Rozelle negotiated television contracts with several networks worth over $14 million per team, and in 1987 the contracts called for about $17 million per team.[46]

These amounts were far more than the Blue Bombers or any other CFL team realized from television. In the early 1960s the Bombers made about $40,000 a year from TV, in the mid-'70s about $100,000, and in the late '70s about $200,000. For three years in the mid-'80s the Bombers and other CFL teams received about $1.2 million annually from television as the result of a deal between the CFL and Carling O'Keefe Breweries. Neither Carling O'Keefe nor anyone else was prepared to pay this much money again. In the late '80s the Bombers and other clubs were getting about $500,000 annually, and in the early '90s close to $1 million.[47]

Television was the major reason for the revenue gap between the NFL and CFL clubs, although it was not the only one. Television was also primarily responsible for the "prestige gap" between the two leagues. Early in the 1960s Canadians began to see NFL games on their TVs, perhaps on their CBC or CTV station, perhaps on an American station. They were influenced by the hype surrounding NFL games and especially the Super Bowl, which was inaugurated in 1967. They were also justifiably impressed by the skill with which American networks produced football (most of the technological or production innovations mentioned earlier were introduced by American networks), and by the athletic ability of players such as Jim Brown, Roger Staubach, and Jerry Rice. In the 1960s the CFL began to be seen as a second-rate league with second-rate players. This perception did not quite fit with reality, because the CFL used a wider field and distinctive rules, and therefore required a somewhat different type of player than the NFL. But the perception was understandable, especially because the American stars in the CFL all seemed to want to go to the NFL. As *Winnipeg Free Press* columnist Scott Taylor put it in 1990, the CFL was "full of sycophants trying desperately to get to the NFL by using the CFL as a minor league training ground."[48]

In 1984 John Herrera, general manager of the Saskatchewan Roughriders, identified the major problem faced by his club and others, including the Blue Bombers: in order to recruit and keep high-quality American players, they had to pay more than they could afford.[49] The fact that every now and then an aggressive owner such as Nelson Skalbania in Montreal or Bruce McNall in Toronto was prepared to pay more than the Canadian market could sustain for a Tom Cousineau or a "Rocket" Ismael simply made things worse for most clubs.

Early in the 1990s the Blue Bombers were bringing in more than six times as much money as in the mid-1950s. Part of it came from television, part from corporate agreements (especially with Labatt Breweries), part from increased attendance (in the late '70s the capacity of Winnipeg Stadium was increased to over 32,000, and in the mid-1980s the team drew an average of about 10,000 more per game than in the mid-1960s). But expenses rose even faster. The Bombers had a deficit nearly every year after 1979. By 1991 the accumulated deficit was about $1.5 million, and in 1992 the Winnipeg Enterprises Corporation picked up about two-thirds of that debt in order to provide some financial stability for its major tenant.[50]

Other clubs in the CFL were in even worse condition. In 1992 it ap-

peared to most people connected with the CFL that the only way the league could survive was by expanding into American cities. In 1993 the first American franchises were established.

Critics of the move into the States predicted that two problems would lead to competitive imbalance. First, American teams would not be required to limit the number of American players on their rosters, and the talent pool in the States was much larger than in Canada. Second, American teams would have more revenue potential than Canadian teams and would outbid the Canadian clubs for star players.

By 1995 Canadian players were holding their own against the Americans, so the first problem had not materialized. However, the second problem certainly had. Teams in San Antonio, Baltimore, Shreveport, Memphis, and Birmingham all had used, or would soon begin to use, stadiums that are significantly bigger than Winnipeg's. They were able to offer much more money for good players than Winnipeg could. Matt Dunigan, who played for the Bombers from 1992 through 1994, and who was one of the top three or four players in the league, became a free agent in 1995. The Winnipeg club could offer him only about one-third the salary available in Memphis and in Birmingham. He signed with Birmingham.[51]

In 1995 the Winnipeg Blue Bombers were more than $3 million in debt, and it seemed likely that this club, along with other western Canadian pro football clubs, would not survive the 1990s.

The new conditions under which pro sports franchises operated in Winnipeg and Brandon after the 1960s made it possible for pro clubs to emerge in fastball, soccer, and basketball. All three sports had long been popular participant activities in Manitoba (fastball is a highly athletic, competitive form of softball) but no professional franchises had existed previously.

In fastball, a professional Western Major Fastball League was formed in 1973, with one of the franchises located in Winnipeg. In 1978 a Westman Club centred in Brandon became a member of the circuit. The Westman Club lasted through 1979, the Winnipeg team through 1981.

In soccer, the professional Winnipeg Fury was established in 1987 as part of a Canadian Soccer League, which normally had teams in about 10 Canadian cities. The Fury played through 1993. The professional basketball team was the Winnipeg Thunder, formed in 1992. The Thunder always did better financially than most of the other teams in the three leagues in which it played, but the club terminated operations in 1994.

These three clubs all relied heavily on sponsorship by breweries and soft-drink companies or by franchises of companies such as Pizza Place or Kentucky Fried Chicken. The clubs did well for a year or two, then began to lose a lot of money. Travel costs were a major problem for all of them.[52]

One reason the Winnipeg Thunder basketball team did poorly in 1994 was that the owner, local concert promoter Sam Katz, was preoccupied with his new pro baseball team, the Winnipeg Goldeyes. It played in the Northern League, won the pennant, and made a profit.[53] But other Manitoba teams had done well for a season or two and then faltered.

In the 1970s, '80s, and '90s, the most visible professional sports franchise in Manitoba was the Winnipeg Jets hockey club. The Jets were formed in 1972, and they joined the World Hockey Association (WHA). This league was established primarily through the energy of a Californian named Gary Davidson, who saw that, even though the NHL had expanded from 6 teams in 1965–66 to 14 teams in 1970–71, there were still many "open" cities in Canada and the United States in which a major-league team would be profitable. The Jets were owned by Ben Hatskin. He had been a member of the Winnipeg Blue Bombers, had made money in pinball and vending-machine businesses, and recently had owned and operated junior hockey teams in Winnipeg.

It was Hatskin who, with the help of other owners in the league, signed the player who ensured some stability and credibility for the WHA: Bobby Hull. By 1972 Hull had spent 15 years with the Chicago Black Hawks. He had scored over 600 goals, and it was just becoming clear that he was the greatest left wing in hockey history. Hatskin agreed to pay Hull $1 million up front and as much as another $2 million over 10 years.

Hull was worth every penny. He was perhaps the best ambassador for his sport that any pro athlete had ever been. Moreover, he remained a great player. In 1974 he began to play on a line with two Swedish imports, Ulf Nilsson and Anders Hedberg. This "hot line" was the biggest attraction in the league, and several knowledgeable hockey people still say that the best line they ever saw was Hull-Hedberg-Nilsson.

In 1974 Hatskin sold the Jets for $2.3 million to a large group of local investors. It became, in effect, a community-owned club. By 1978 the team was losing a little money annually, mostly because of the interest on the $1.2 million still owed to Hatskin. But it was obvious by this time that even though the WHA was the weaker of the two leagues, it had cost NHL owners a lot of money, especially in competing for players. A group of about 50 investors headed by Michael Gobuty, who was in the leather business, and Marvin and Barry Shenkarow, who were in real estate, bought the Jets, gambling that the team would soon be in the NHL. The gamble paid off. In 1979 the NHL "expanded" (this was really not an "expansion" but a "merger") to include the Jets and three other WHA teams.

Immediately, the Jets began to lose money. The value of the franchise went up, of course, but expenses for each year's operations exceeded revenues by a million dollars or so. Part of the problem lay in unusual expenses, such as the $500,000 a year for eight years that the Jets agreed to pay Winnipeg Enterprises Corporation to expand the Winnipeg Arena to a capacity of about 15,000. But the major problem was lack of revenue, especially television revenue from local stations. In 1983–84 the Jets received

about $600,000 from television, but the Vancouver Canucks received about $2 million and the Montreal Canadiens about $3 million. Advertisers were not willing to pay as much for exposure through Jets games as they were for exposure through games played by teams located in larger television markets.

In 1984 the Jets' financial situation improved somewhat. The club made a deal with its landlord, Winnipeg Enterprises Corporation, as well as with the city and provincial governments, which promised to improve its balance sheet by about $1 million a year for the next 10 years. But the team was still vulnerable. By the standards of the other cities in the NHL, Winnipeg was a small city and a poor city, and average attendance, average ticket price, and amount of broadcast revenue were all comparatively small.

In the 1980s Barry Shenkarow emerged as the main owner of the Jets. He wanted to keep the club in Winnipeg, but in the late '80s and early '90s he did not pass up opportunities to mention that he was losing money by not moving his franchise. In 1991 he concluded an important agreement with the province, the city, and several Winnipeg business leaders. The province and the city (through Winnipeg Enterprises Corporation) became minority owners of the Jets, and each agreed to pick up 50 percent of the losses on the team's operations. A fund would be created out of which the present owners would annually receive interest at 3 percent less than the prime rate on the (assumed) $32 million value of the club. Meanwhile a committee chaired by Arthur Mauro, who had just retired as chief executive officer of Investors Group, would study the feasibility of various proposals to build a new arena. In return, Shenkarow agreed not to move the Jets until 1996–97, or 1994 if by that time nothing had been done about a new arena.[54]

Early in the 1990s it was obvious that the Jets would thrive in Winnipeg only if one or more of three developments occurred. The first was the construction of a new arena, especially one that would allow the Jets to sell attractive private boxes to corporations. The boxes would become corporate tax write-offs. The second was an arrangement among the clubs for shared revenue from television. The third was the conclusion of an agreement between NHL owners and players so that small-market teams such as the Winnipeg Jets or the Edmonton Oilers would not have to compete for players with big-market teams such as the New York Rangers, Chicago Black Hawks, or Los Angeles Kings. Late in 1992 the NHL expanded by adding two teams, one in Miami, Florida, and one in Anaheim, California. This expansion meant about $3 million to the Jets. But because the new teams were owned by Blockbuster Video and the Disney Corporation, respectively, both of which had large pools of capital and huge spinoff potential from marketing and licensing agreements, new sources of revenue and an agreement with the NHL Players' Association that favoured small-market teams became even more imperative.[55]

In the spring of 1995 it appeared that the Jets would leave Winnipeg. In fact, there was a public farewell celebration for the club early in May. Then in the middle of May, a last-ditch effort to save the team was made by politicians, business leaders, journalists, broadcasters, and especially ordinary citizens.

The effort succeeded. New local investors bought part of the club, and plans were under way to build a new arena. There was little reason to hope that salaries would start to diminish, but there was reason to think that soon a hockey cable channel would be created and made available to Canadians, and that Canadian NHL teams would acquire some revenue from it. There was still hope, in other words, that new circumstances might allow the franchise to make economic sense.[56]

CONCLUSION

The Winnipeg Jets of the early '90s experienced problems similar to those faced by nearly every Manitoba pro sports team for over a hundred years. The entire history of the pro sports industry in the Keystone Province reveals what the histories of many other industries also reveal. This is that Manitoba is part of a "hinterland region," the western interior of Canada. This region has been dominated by economic, cultural, and political forces emanating for the most part from central Canada and from the United States and Britain. Manitoba has a "peripheral economy," in which, especially because of low population density and great distances between cities, it has always been difficult to maintain industries or businesses that would thrive elsewhere.[57] It seems likely that the globalization of capital and industry under way in the 1990s will make maintaining such industries and businesses even more difficult in the future.

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NOTES

1. Many of these are identified in J.F. Rooney, *A Geography of American Sport: From Cabin Creek to Anaheim* (Reading, MA: Addison-Wesley Publishing Company, 1974), 1–13; and in J.F. Rooney, "Sports from a Geographic Perspective," in *Support and Social Order: Contributions to the Sociology of Sport*, ed. D.W. Ball and J.W. Loy (Reading, MA: Addison-Wesley Publishing Company, 1975), 51–115.
2. Rooney, *A Geography of American Sport*, 97–101; J. Bale, *Sports Geography* (London: E. and F.N. Span, 1989), 77–87.
3. J. Quirk, "An Economic Analysis of Team Movements in Professional Sports," *Law and Contemporary Problems* 38(1973):43.
4. Ibid., 42–66; W.C. Neale, "The Peculiar Economics of Professional Sports," *Quarterly Journal of Economics* 78, 1(February 1964):1–14; H.G. Demmert, *The Economics of Professional Team Sports* (Lexington, MA: Lexington Books, 1973); P.J. Sloane, "Restriction of Competition in Professional Team Sports," *Bulletin of Economic Research* 28(1976):3–22; R.G. Noll, "The U.S. Team Sports Industry: An Introduction,"

in *Government and the Sports Business,* ed. R.G. Noll (Washington, DC: The Brookings Institution, 1974), 1–32; J. Quirk and M. El Hodiri, "The Economic Theory of a Professional Sports League," in Noll, ed., *Government and the Sports Business,* 33–80.

5. Besides the sources identified in n. 4, see J.C.H. Jones, "The Economics of the National Hockey League," *Canadian Journal of Economics* 2, 1(February 1969):1–20; B. Kidd, *The Political Economy of Sport* (Ottawa: Canadian Association of Health, Physical Education and Recreation, n.d.), especially ch. 5; several articles in P.D. Staudohar and J.A. Mangan, eds., *The Business of Professional Sports* (Urbana, IL: University of Illinois Press, 1991), especially the article by D. Mills, "The Blue Line and the Bottom Line: Entrepreneurs and the Business of Hockey in Canada, 1927–90," 175–201; R. Beamish, "The Political Economy of Professional Sport," in *Not Just a Game: Essays in Canadian Sport Sociology,* ed. J. Harvey and H. Cantelon (Ottawa: University of Ottawa Press, 1988), 141–57.
6. It is not well known that one main reason the National Hockey League began to locate franchises in large American cities in the 1920s is that these cities had huge facilities (e.g., Madison Square Garden) with open dates. See P. Hoch, *Rip Off the Big Game: The Exploitation of Sports by the Power Elite* (Garden City, NY: Doubleday, 1972), 30; S.A. Riess, *City Games: The Evolution of American Urban Society and the Rise of Sports* (Urbana, IL: University of Illinois Press, 1989), 234, 239.
7. The standard history of the province is W.L. Morton, *Manitoba: A History,* 2nd ed. (Toronto: University of Toronto Press, 1967). Some useful statistical information can be found in the appendix of G. Friesen, *The Canadian Prairies: A History,* student ed. (Toronto: University of Toronto Press, 1987), especially table 9.
8. See Friesen, *The Canadian Prairies,* appendix, table 7; A.F.J. Artibise, ed., *Town and City: Aspects of Western Canadian Urban Development* (Regina: University of Regina, Canadian Plains Research Center, 1981), statistical appendix, table A1; A. MacLean and R. Rounds, "An Analysis of the Population of Agro-Manitoba, 1961–1986," (Brandon: Brandon University Rural Development Institute, 1991), appendix A.
9. C. Craw, "The Manitoba-Dakota Baseball League: A Short History" (unpublished history paper, University of Manitoba, 1982); B. McConachy, "The History of the Man-Dak League" (unpublished history paper, University of Manitoba, n.d.); telephone interview with Mr. Terry Hind, 15 November 1992; (Winnipeg) *Free Press,* 18 September 1951, 2 November 1953. Until 1939 the (Winnipeg) *Free Press* had been the *Manitoba Free Press.* Hereafter, this newspaper will be referred to as *FP,* whatever its precise title.
10. This information comes from research in about a dozen weekly newspapers and in several dozen local-history books published by centennial committees or other community organizations. See also *FP,* 23 June 1984.
11. Much of this information comes from the *Virden Empire Advance,* 1926–30. Some comes from interviews with Mr. W. Fred Bridgett and Miss H.E. Bridgett, 18 August 1984. Important aspects of the story have been gleaned from G. Lucht, "Scobey's Touring Pros: Wheat, Baseball and Illicit Booze," *Montana: The Magazine of Western History* 20, 3(July 1970):88–93; D. Shury, "The Chicago Black Sox and their Saskatchewan Connection," in *Saskatchewan Historical Baseball Review 1987* (Battleford, SK: Saskatchewan Baseball Hall of Fame Museum Association), 60–1; M. Mott, "Disgraced Black Sox Played in Virden," *Brandon Sun,* 12 October 1988; T. Frayne, *The Tales of an Athletic Supporter* (Toronto: McClelland and Stewart, 1990), ch. 2; J. Thompson, "Baseball's Contribution to Virden, 1926–30" (unpublished history paper, University of Manitoba, n.d.); E. Asinov, *Eight Met Out: The Black Sox and the 1919 World Series* (New York: Holt, Rinehart and Winston, 1963); R. Peterson, *Only the Ball Was White* (Englewood Cliffs, NJ: Prentice Hall, 1970), especially 149–50 (on the Colored Giants); J. Kirshenbaum, "The Hairiest Team of All," *Sports Illustrated,* 13 April 1970, 104–16 (on the House of David).
12. This narrative is based upon 1886 issues of the *Manitoba Free Press, Manitoba Sun, Winnipeg Siftings,* and *Portage la Prairie Weekly Tribune-Review.* See also M. Mott, "The First Pro Sports League on the Prairies: The Manitoba Baseball League of 1886," *Canadian Journal of History of Sport / Revue Canadienne de l'histoire des sports* 15, 2(December 1984): 62–9.
13. *FP* and *Winnipeg Tribune,* 20–23 December 1907. On "Bad" Joe Hall, see S. and S. Fischler, *Fischler's Ice Hockey Encyclopedia,* rev. ed. (New York: Thomas Y. Cromwell Company, 1979), 242–3. Technically the game described here was not a league game. It was a game between two teams trying to qualify to be in the league.
14. This history of the Manitoba Professional Hockey League is based upon information in the *FP, Winnipeg Tribune,* and *Winnipeg Saturday Post.* Some of the story is contained in M. Mott, "The Problems of Professionalism: The Manitoba Amateur Athletic Association and the Fight Against Pro Hockey, 1904–1911," in *Winter Sports in the West,* ed. E.A. Corbet and A.W. Rasporich (Calgary: The Historical Society of Alberta and the University of Calgary, 1990), 138–9.
15. See *FP,* 12 December 1908, 26 August 1911; *Brandon Times,* 6 February 1908.
16. On this organization, see A. Metcalfe, *Canada Learns to Play: The Emergence of Organized Sport, 1807–1914* (Toronto: McClelland and Stewart, 1987), especially ch. 4; K.L. Lansley, "The Amateur Athletic Union of Canada and Changing Concepts of Amateurism" (Ph.D. thesis, University of Alberta, 1971); F. Cosentino, "A History of the Concept of Professionalism in Canadian Sport" (Ph.D. thesis, University of Alberta, 1973).
17. *Brandon Times* and *Brandon Sun,* 1908–11, especially the *Brandon Sun,* 29 September 1910, 24 August 1911; *FP,* 6 April 1912.
18. *FP,* 1902–17, especially 23 September 1911, 6 July 1917; *Winnipeg Saturday Post,* 28 October 1911.
19. *FP,* 18 April 1908, 12 June 1909, 11 August 1911, 30 December 1911.
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33. *Hockey News,* 5 October 1957, September 1958, 11 February 1961; *FP,* 1956–59, especially 17 January 1957, 7 March 1957, 14 October 1957, 19 September 1959.
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50. *FP,* 1977–92, especially 30 January 1981, 4 November 1981, 4 September 1987, 15 August 1991, 14 November 1991, 16 May 1992; *Toronto Star,* 17 November 1985.
51. *FP,* 21 August 1992, 21 October 1992, 5 November 1992, 13 November 1992, 3 February 1993, 14 February 1993, 23 February 1994, 20 February 1995, 15 March 1995, 12 May 1995.
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Case Study 20.1
The Winnipeg Whips, 1970–71
Morris Mott

High travel costs have been a thorn in the side of nearly every professional sports franchise in Manitoba's history, but for no team did travel cause more financial discomfort than the Winnipeg Whips baseball club.

The Whips were established in June 1970. They were the reincarnation of the Montreal Expos' failing Buffalo, New York, Class AAA farm team. The Expos were willing to move the club to Winnipeg partly because General Manager Jim Fanning was familiar with Manitoba's capital — the Winnipeg Goldeyes had been one of his opponents when he managed at Eau Claire, Wisconsin, in the Northern League — and partly because Maitland Steinkopf, one of the Winnipeg promoters of the team, was a cousin of Charles Bronfman, the Expos' owner.

The Expos were also impressed by the fact that $50,000 of Winnipeg money would be available to the franchise — a good deal of it from O'Keefe Brewing Company Ltd. The Expos already had a Class A club in Winnipeg — it had existed for only one year and had used the name "Goldeyes" just as the old Northern League team had from 1954 to 1964 — but the team had not yet begun play in the 1970 season. To make way for the Whips, the Goldeyes were moved to Watertown, South Dakota.

The Whips played in the International Baseball League, along with clubs in cities in the northeastern United States such as Rochester, Syracuse, and Louisville. The closest club to Winnipeg was located in Toledo, Ohio, over 1,600 km away by air. To gain permission to move their club to Winnipeg, the Expos had to agree to pick up most of the costs of air travel for every team once they flew over Toledo. The Expos knew that this would be an expensive obligation, but felt that it was important to get the franchise out of Buffalo and then try to shift it in a year or two to the Class AAA American Association, with teams in western American cities such as Wichita, Omaha, and Oklahoma City.

The experiment did not work. By the end of the 1971 season, the Whips were about half a million dollars in the red. Part of the problem was slightly lower attendance and revenue than anticipated. The Whips were not a good team. In 1970 they finished in second-last place; in 1971 they finished a very poor last, 42 games away from first place. (The Montreal Expos had become a major-league team only in 1969, and still did not have depth in their organization.)

Attendance was also negatively affected by the poor ballpark in Winnipeg. The Whips played in the Winnipeg Stadium, a football stadium that could not easily accommodate high-calibre baseball. One of the main problems was that the outfield fences were too close to home plate. Reyn Davis, who covered the Whips for the *Winnipeg Free Press*, recalls one game, with the wind blowing from the home plate to the outfield, in which the Whips hit nine home runs — and lost!

However, the main business problem for the Whips was the cost of travel. The club's total travel expenses for 1971, including the share of visiting teams' costs, came to about twice as much as net revenue from home games, and there were still office expenses and salaries to cover. Even though visiting clubs paid only a portion of their travel costs to and from Winnipeg, the trips were expensive by their standards. They did not want Winnipeg in their International Baseball League. Neither did the clubs in the American Association; as Jim Fanning put it, the "American Association wants no part of Winnipeg." Manitoba's capital city was "a long way from Tulsa, Oklahoma City and Omaha," just as it was from Toledo or Louisville.

In November 1971 the Montreal Expos announced that the Winnipeg Whips would be moved to Lynchburg, Virginia.[1]

NOTES

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OUTLOOK

21

John Everitt
John Welsted
Christoph Stadel

In this volume a number of authors have portrayed the geography of the province of Manitoba, the "Keystone Province," at the end of its first century and a quarter. But what of the future of our region and its people? As C. Emdad Haque observed with respect to population, predicting the future is difficult; nevertheless, it may be possible to project some trends by assessing what has happened in the past 125 years.

It is unlikely that major changes will occur in the physical landscape of Manitoba in the next 125 years; this time period is but the blink of an eye on the geological time scale. Even relatively fast geological processes such as the isostatic rebound of Hudson Bay from the weight of Pleistocene ice will show little result in that short time span.

However, a few faster geomorphological processes will have some effect. For example, rivers erode and deposit rocks quickly enough to produce measurable changes over a 100-year period. Meanders develop and are cut off in that time, but even in this case human control of river regimes by dam construction tends to delay the natural process.

We must also recognize the existence of one geomorphological agent that had virtually no effect in the great span of time before the province was established — humans. People were here before the political unit known as Manitoba existed, but the mostly nomadic Aboriginal people changed the face of the land very little. In contrast, in the past 125 years the greatest geomorphological changes have been the result of human activity.

New shorelines are forming around Southern Indian Lake in response to the rise in lake level associated with the Churchill diversion, and the lower Churchill River, once a series of lakes joined by stretches of river, has become a relatively small river, flowing through expanses of sand where the lakes used to be. A ditch the size of a major river channel — the Winnipeg floodway — has been excavated around Winnipeg, and another one runs from near Portage la Prairie to Lake Manitoba.

Finally, although much mining in Manitoba is subsurface, in a few places open-cast methods have completely changed the landscape. This is noticeable in areas such as the Birds Hill esker and along the Lake Agassiz beaches where sand and gravel pits have been dug.

On a smaller scale but of widespread importance, thousands of small sloughs have been drained to increase the amount of land available for agriculture, particularly in the ground moraine areas of the province. Large lakes are being filled in; "on average, about 500,000 tons of sediment per year enter into Dauphin Lake," and at this rate "the lake would be completely filled in about 2,300 years."[1] A delta deposited into the lake at the mouth of Edwards Creek over the past 45 years was initiated by human activity. The Red River Plain, a marshy, water-logged area less than a century ago, is now drained by a myriad artificial drainage channels. It is ironic that this area, which once had too much surface water, is now looking for ways to increase water supply.

The artificial drainage, coupled

with the clearing of land for agriculture, has resulted in the loss of wildlife habitat in the southern part of the province, and there is a danger that some species will become extinct. Also, the removal of the grassland cover in this area means that this Prairie province is no longer a prairie-covered region.

Agro-Manitoba depends on a layer of soil no more than a metre in thickness that has formed during the past 10,000 years. But deterioration has occurred, most of it in less than 100 years. The most serious problems are erosion by water and wind and the loss of organic matter. The Canadian *Green Plan* (1991) shows that several areas of southern Manitoba have been subject to moderate erosion by water[2] and moderate to severe erosion by wind,[3] and that the areas underlain by black soils (most of south-central and southwestern Manitoba) have lost 49 percent of the organic content of the "A" horizon.[4]

Soils cannot be replaced, a fact that has to be recognized by all who use them if the province is to preserve its status as a major agricultural region of the world. It is no exaggeration to suggest that the soil could be entirely depleted and the economic base of the province devastated within the next 125 years if this resource is misused. Fortunately, steps are already being taken in the form of conservation techniques and the establishment of conservation districts.

There has been a great deal of discussion of, but very little agreement about, climatic change, although it has been blamed for a whole range of events, including an increase in forest fires and floods as a result of global warming![5] Some people, Timothy F. Ball included, believe in a climatic cycle and believe that the Prairies can expect periods of relatively wet and relatively dry conditions. However, it is difficult to make any definitive statement about the future, given the relatively short period for which climate statistics are available.

In any case, Manitoba is marginal with respect to climatic suitability for agriculture, in terms of both precipitation and length of growing season. To counteract the former and to improve the range of crops that can be grown, more emphasis on irrigation can be expected. But irrigation is no panacea. The increased use of pesticides and fertilizers that often occurs with irrigation may pollute nearby rivers and streams or the underlying ground water. Increased irrigation will probably result in demands for transfer of water from areas that have a perceived abundance to areas that have a perceived deficiency.

At the same time there will have to be — and to some degree this has already started — better efforts at water conservation and more sensible use of water in all spheres of life. Winnipeg, which has one of the best sources of municipal water in Canada in the form of Shoal Lake, is concerned about possible mining developments around the lake and the divided jurisdiction over the lake waters.[6] Partly as a result, the city has embarked on an aggressive water conservation campaign.

Paradoxically the "human environment" of Manitoba seems to be both settled and changeable at the same time. The survey system assures that the look of the landscape is unlikely to become radically different in the near future, but the changes resulting from the loss of the "Crow rate" (as of 1 August 1995) grain transportation subsidy,[7] the possible closure of the port of Churchill to the grain trade — despite the major political implications of such a move[8] — and the increased funnelling of this trade southward across the United States–Canada border at the expense of the Lakehead means that the some aspects of the humanized landscape could be altered dramatically.

Pundits are already predicting a decrease in wheat growing and an increase in cattle production, so that Manitoba would be more like Alberta. Others are projecting an increase in food processing and related industries close to the production sites, which could substantially change the structure of agriculture and food processing in the province. But as such changes are a function of politics as much as economics, the future remains murky.

Rail line abandonment, which has been occurring on a large scale for 20 years, will probably continue, and it may be accompanied by road abandonment as well. The maintenance of municipal roads along most section lines is economically beyond the means of many rural municipalities in southern Manitoba. At the same time, Manitoba is well located to become a transportation hub for both air and land travel within North America. If economic conditions are suitable, Manitoba's location may once again prove to be advantageous and have positive effects upon all sectors of the economy.

Although the depopulation of rural Manitoba once seemed to have mostly run its course, economic and social changes could lead to the redistribution of the remaining people, and perhaps the loss of more of them to urban areas. Some rural municipalities and many of the smaller unincorporated settlements still seem to be the most subject to change, particularly decline, except in the former Mennonite reserves and around Winnipeg.

Although there are real dangers of both an economic decline and a deterioration in the quality of life resulting from these population shifts, it is possible that they can be counterbalanced in rural areas, as in the north, by new technology such as the "electronic information highway." This innovation has been compared to rural electrification in terms of its potential for change, and could have major effects upon education, training, and employment opportunities — and thus upon economic development in rural and remote areas.

In an urban context, during the past 20 years there have been dramatic changes in the structure of major settlements, with downtown decline at the expense of shopping malls in the fringes. Despite efforts to reverse this trend, it seems likely to continue unless major efforts are made to change peoples' perceptions and reduce their dependence upon the automobile.

Some changes seem more certain. The proportion of elderly in most areas is likely to increase, in some instances significantly, and this will continue to challenge the resources (for example, health care)

of the province. Many Manitoba communities see the elderly as a possible source of economic and social salvation for their communities, while at the same time continuing to see youthful cohorts drained off to the cities. Some minority populations, such as Native people and Hutterites, are likely to increase also. The potential social and economic ramifications of these changes are unclear, but the social structure of many rural areas in Manitoba will certainly be dramatically affected.

Everything points to a continued heavy concentration of population in and close to Winnipeg, despite government efforts to relocate government services to regional centres. The ethnic composition of Winnipeg is changing because of recent immigration from Asia and Latin America, a trend likely to continue.

The North is likely to continue along its usual road of boom and bust, reflecting the control over this part of the provincial economy exercised by forces not only external to the province but also, in many instances, to the nation. It is, however, in this region that recent technological innovations, such as the electronic information highway, may have a major impact, enabling inhabitants to improve their access to other regions and enhance their quality of life in areas such as health care and education.

The future of Churchill as a tourist centre, a space centre, and a grain-shipping centre will be tied to the future of northern Manitoba. If the settlement can survive the present uncertainty, build on its strengths, and convince nations such as Russia — as well as the government of Canada — that it is a viable alternative to ports on the east coast, it could become a growth pole for its local region.

Changes for the peoples of the North are also likely to be tied to changes in the political and economic structures that affect First Nations people, who dominate the region. Not all reserve claims are settled, and some Indian groups may successfully claim areas that are potentially mineral-rich. This would transform their lifestyle and perhaps culture if they follow non-Native patterns of resource exploitation.

The lives of First Nations people in all of Manitoba may also be significantly affected by the transfer of local governance from the federal to the local level. Such a shift is likely to encourage local leadership and local initiatives, and could help reduce unemployment by increasing the potential for economic development on reserves.

The political map of Manitoba now seems to be quite settled, and dramatic changes seem unlikely to result from elections in the near future, although electoral boundaries will continue to be revised. But in this context 125 years is a long time. Several political parties have appeared and disappeared, and there is no reason to believe that this will not also be true during the next century.

The political boundaries of the province — international and interprovincial as well as internal — make little geographical sense. The straight lines between rural municipalities cut across the obvious physical divisions, and it should be expected that various groupings — such as planning districts and conservation districts that include a number of contemporary political units — will become more common and cover more of the southern part of the province.

The importance of straight-line political boundaries will probably change. The North American Free Trade Agreement should reduce the barrier effect of the international border, but ironically provincial boundaries are likely to become more marked as devolution of power and fiscal responsibility from the federal government continues. At the municipal level, straight-line boundaries will become less significant as planning districts, conservation districts, and larger school districts are established. There are too many administrative units today, and groupings of various sorts will become increasingly necessary.

Manitoba has always been a source of different kinds of resources, and although the form of this resource base may change, the exploitation of primary products is likely to remain a feature of the province's future. There is always a chance that other resources, particularly minerals, will be found, and it is possible that more oil can be found and exploited in the southwest and in the north using modern — or currently futuristic — techniques. It remains to be seen whether secondary processing of these resources will also occur, and whether the tertiary, quaternary, and quinary economic sectors will expand, at least outside the Perimeter Highway around Winnipeg.

Water is one of the most important resources. To date there is enough in most areas for most of the activities people wish to engage in, but increasingly this resource will be stressed, leading to conflicts, especially in the south-central and southwestern areas. This fact has already been acknowledged by the establishment of the Assiniboine Basin Study Board, which aims to look at all aspects of Assiniboine water use. It is inevitable that more such regional boards will be established in the future.

Hydro-electricity will continue to be the main source of power for the province, and a considerable source of income. Its importance as a renewable power source may be particularly telling. But the major era of hydro-dam building is past, with only the Conawapa plant likely to be constructed in the near future. Emphasis will probably be on small-scale stations or upgrading of existing plants.

A last projection, and one that appears somewhat safer, is that recreation will continue to increase in importance in Manitoba as elsewhere, although the nature of this recreation — professional versus amateur, indoor versus outdoor, active versus passive, and so on — is harder to predict. But recreation in rural areas and in the North is becoming more important and more popular, and the potential for regional growth appears to be recognized. There is even the possibility of increased ecotourism and winter tourism.

Thus regional tourism associations promote the virtues of the Boundary Commission Trail (along Highway 3), the Red Coat Trail (following Highway 2), and the START

(Southwest Trails Association for Regional Tourism) region, which covers the area from Riding Mountain National Park to the Saskatchewan and North Dakota borders. If successful, these groups could transform the nature of tourism and recreation within the provincial boundaries.

There is also a push to establish at least one more national park in the province. The area around Churchill, the Hecla Island area, and the Long Point area at the north end of Lake Winnipeg have been mentioned as possibilities.

CONCLUSION

Although Manitoba has in many ways reached a steady state after a century and a quarter of dramatic growth and change, such a state appears to be merely a transitional stage on the way to a geography that could be very different. But there is nothing to suggest that the province's traditional "peripheral" primary role as "hewer of wood and drawer of water" for central Canada is likely to change substantially in the foreseeable future. If anything, this role may become intensified and more characteristic of Manitoba than ever before. Also, despite efforts to counteract its pull, Winnipeg will continue to dominate the province as does no other primate city in Canada.

The strength of Manitoba has been, and will continue to be, found in the diversity of its people and in the cooperative spirit that has characterized the province's population. But it can be argued that our province has recently lacked visionary people such as those it had in the past — people who not only recognize the potential of Manitoba but also use the capacity of the region to best effect. We hope that new leaders will emerge and that the next century will be a fruitful one for the province.

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4. Ibid., fig. 9.11.
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ABBREVIATIONS

A.D.	anno Domini
B.P.	before the present
CAI	Core Area Initiative
CBC	Canadian Broadcasting Corporation
CBD	central business district
CCF	Cooperative Commonwealth Federation
CEC	Canadian Elevator Company
CLI	Canada Land Inventory
CMA	Census Metropolitan Area
CNor	Canadian Northern Railway
CNR	Canadian National Railway
CPR	Canadian Pacific Railway
DREE	Department of Regional Economic Expansion
DRIE	Department of Regional Industrial Expansion
FFMC	Freshwater Fisheries Marketing Corporation
FRC	Forks Renewal Corporation
FRED	Fund for Rural Economic Development
FTA	Free Trade Agreement
GATT	General Agreement on Tariffs and Trade
GGGCo.	Grain Growers Grain Company
GN	Great Northern Railway
GNWC	Great North West Central Railway
GST	Goods and Services Tax
GTP	Grand Trunk Pacific Railway
HBC	Hudson's Bay Company
HBMS	Hudson Bay Mining and Smelting Company Ltd.
IJC	International Joint Commission
KRF	Knife River Flint
LGD	local government district
LofW	Lake of the Woods Milling Company
LWCB	Lake of the Woods Control Board
M&NW	Manitoba and Northwestern Railway
MAPL	Manitoba Air Photo Library
MCGW	Metropolitan Corporation of Greater Winnipeg
MEC	Manitoba Elevator Commission
MFAC	Manitoba Federation of Agriculture and Co-operatives
MFU	Manitoba Farmers' Union
MGEA	Manitoba Government Employees' Association
NAFTA	North American Free Trade Agreement
NAPL	National Air Photo Library
NDP	New Democratic Party
NHL	National Hockey League
NP&M	Northern Pacific and Manitoba Railway
NPTP	Northern Patient Transport Programme
NWC	North West Company
PAM	Provincial Archives of Manitoba
PFRA	Prairie Farm Rehabilitation Administration
RAG	Resident Advisory Group
RAP	Regional Analysis Program
RM	rural municipality
RMNP	Riding Mountain National park
TDR	total dependency ratio
TED	Targets for Economic Development
TFR	total fertility rate
UFM	United Farmers of Manitoba
UGG	United Grain Growers
ULL	Urban Limit Line
VCR	vertical-crater retreat [mining]
VMS	volcanogenic massive sulphide
WHL	Western Hockey League
WIFU	Western Interprovincial Football Union
YDR	youth dependency ratio