

Farm Implement Firms as Symptomatic of the Rise of Regional Grain Cities: Winnipeg and Minneapolis, 1876-1926

by Terence J. Fay
1980

The Institute of Urban Studies





THE UNIVERSITY OF
WINNIPEG

FOR INFORMATION:

The Institute of Urban Studies

The University of Winnipeg
599 Portage Avenue, Winnipeg
phone: 204.982.1140
fax: 204.943.4695
general email: ius@uwinnipeg.ca

Mailing Address:

The Institute of Urban Studies

The University of Winnipeg
515 Portage Avenue
Winnipeg, Manitoba, R3B 2E9

**FARM IMPLEMENT FIRMS AS SYMPTOMATIC OF THE RISE OF REGIONAL GRAIN CITIES:
WINNIPEG AND MINNEAPOLIS, 1876-1926**

Published 1980 by the Institute of Urban Studies, University of Winnipeg

© **THE INSTITUTE OF URBAN STUDIES**

Note: The cover page and this information page are new replacements, 2015.

The Institute of Urban Studies is an independent research arm of the University of Winnipeg. Since 1969, the IUS has been both an academic and an applied research centre, committed to examining urban development issues in a broad, non-partisan manner. The Institute examines inner city, environmental, Aboriginal and community development issues. In addition to its ongoing involvement in research, IUS brings in visiting scholars, hosts workshops, seminars and conferences, and acts in partnership with other organizations in the community to effect positive change.

FARM IMPLEMENT FIRMS AS SYMPTOMATIC OF
THE RISE OF REGIONAL GRAIN CITIES:
WINNIPEG AND MINNEAPOLIS, 1876-1926

by

Terence J. Fay
University of Winnipeg

Presented at the Northern Great Plains
History Conference, University of
Minnesota Duluth, October 23-25, 1980

Conference paper publication sponsored
by the Institute of Urban Studies,
University of Winnipeg



ACKNOWLEDGEMENTS

For support in the research and in the preparation of this text, I wish to acknowledge help from the Institute of Urban Studies, the Departments of History of the University of Winnipeg and the University of Manitoba, John Wickre and Allan Woolworth of the Minnesota Historical Society, Ernest Symonds of Rocarville, Saskatchewan, the Jesuit Community of St. Paul's College, and to many others who made suggestions and proofread the copy.

*Terence J. Fay
Winnipeg 1980*



I.U.S. No. 068

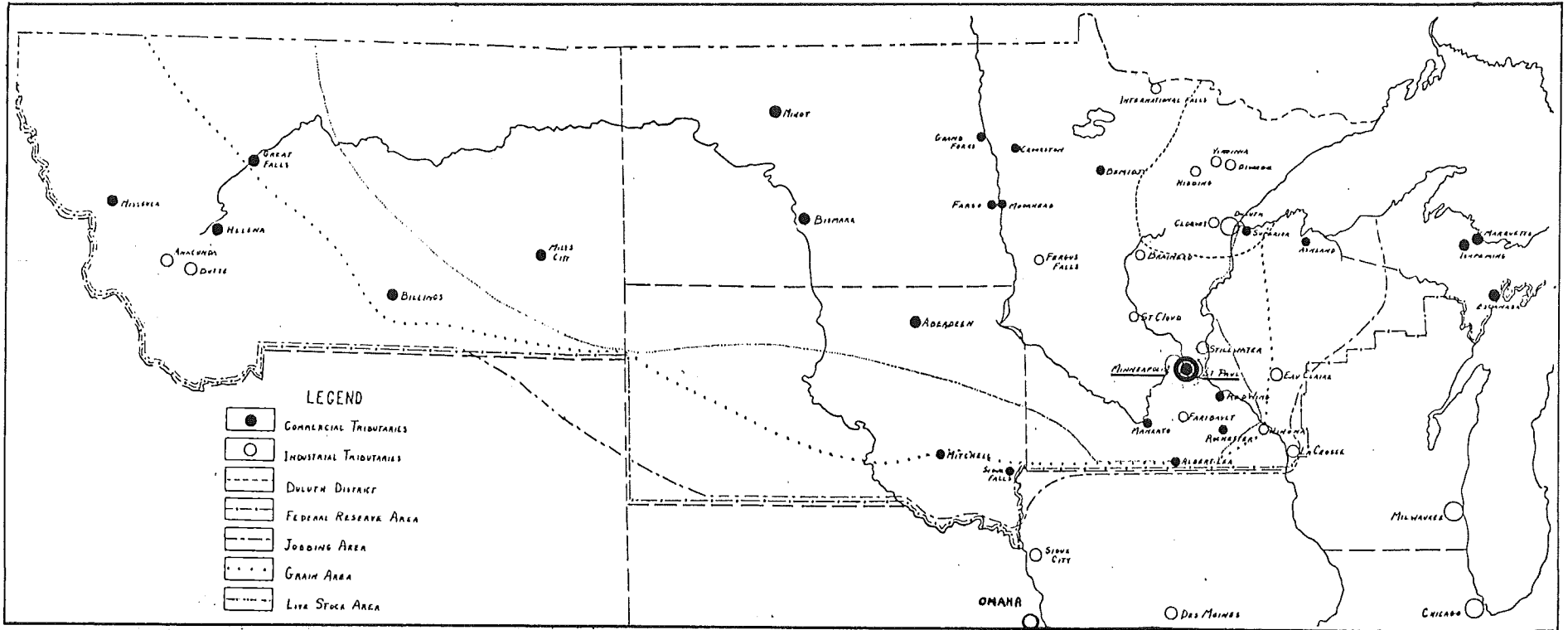


The urban system in Canada crystallized in the last decade of the nineteenth century and the first decade of the twentieth century as interurban links were established in cities along the Canadian transcontinental railway lines. The urban system in the United States, owing to the larger number of cities and railway lines and the greater number of choices available among these cities, crystallized more deliberately into more complicated patterns. Urban system as used in this paper is defined as a series of intercity business links that stretch across a nation, providing similar services and binding citizens together with common products and ways of acting.¹ Winnipeg and Minneapolis established dominance over their hinterlands only to be absorbed into their respective urban systems, but at different rates of integration. Winnipeg was integrated more quickly into the Canadian system than was its sister grain city to the south, Minneapolis, into the American urban system. Examination of farm implement firms of both cities will demonstrate this.

Farm implement firms were very much the central industries of grain cities. The growth of implement industries can be looked upon as symptomatic of the economic growth of such cities. Urban growth was dependent upon the grain crop, and industrial growth was greatly affected by the sale of machinery for this purpose. The sale of farm machinery relates back to the size of the crop already processed and to the future crop to be processed. Farm implement firms can, therefore be considered indicators of the agricultural, commercial, and industrial development of plains cities such as Winnipeg and Minneapolis. Along with data from other types of firms during this period, they provide manifold information for the comparative growth of these two cities and their urban systems.

Two years after the incorporation of the city of Winnipeg in 1874, Henderson's Directory listed five implement firms in the city, all of them regionally owned. Davidson's Minneapolis City Directory listed four regionally owned implement firms, with one additional firm from Iowa. By 1920, half way through the period under consideration here, the number of Winnipeg implement firms numbered a modest 17 while Minneapolis implement firms had

MINNEAPOLIS : HINTERLAND

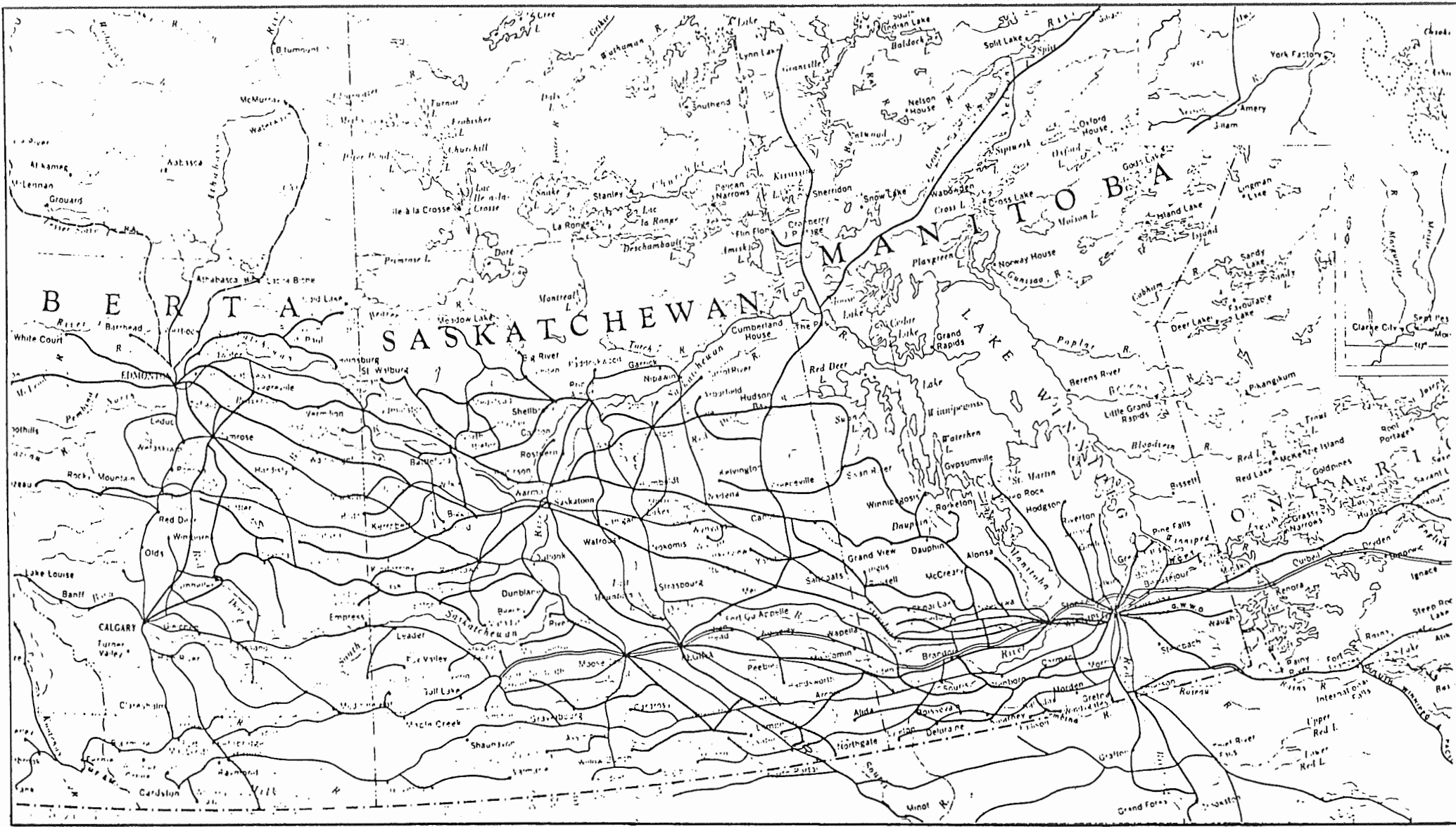


Source: M.L. Hartsough, The Twin Cities As a Metropolitan Market [Minneapolis: University of Minnesota, 1925], p. x.

jumped to 60. Regional firms in Minneapolis at this point outnumbered national companies by three stores. Reversing the Minneapolis implement firm distribution of more regional than national firms, in Winnipeg national implement firms outdistanced the regional firms by a count of three stores. By 1920, the numerical apogee of firms under consideration, Minneapolis supported 89 farm implement firms, almost double the number of Winnipeg's 49 firms. In Minneapolis during the same year, regional firms outnumbered national firms by 19, whereas national companies in Winnipeg maintained dominance over regional firms. At the end of this period in 1926, Minneapolis regional firms maintained a six-firm edge over national companies, while national companies in Winnipeg dominated regional firms by the number of twelve. During a period of 51 years under observation, Minneapolis-owned firms outnumbered national companies in forty-four of those years; in Winnipeg, by contrast, national companies outnumbered regional firms in thirty-six years of this period.²

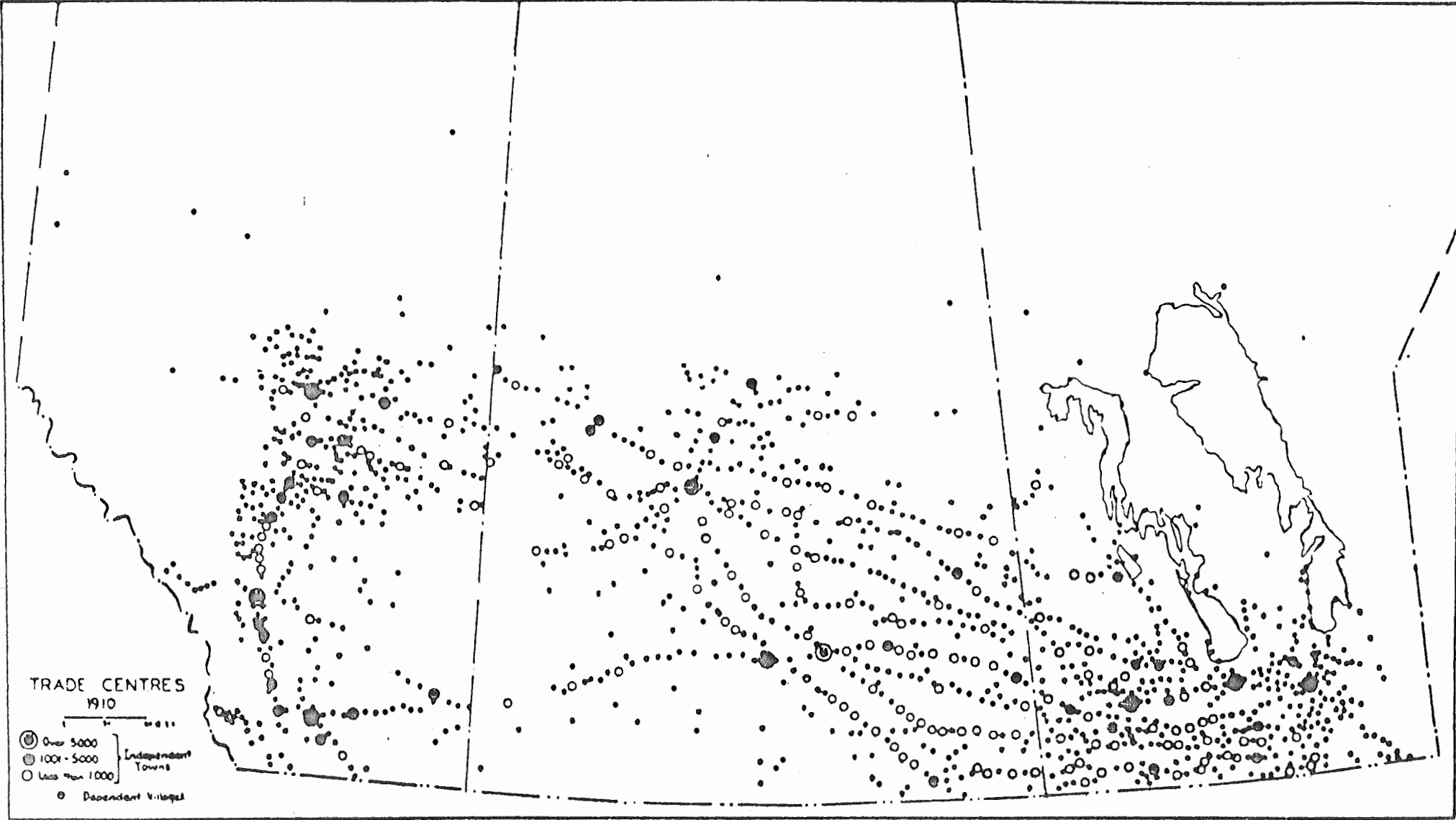
Thus do the city directories, with the addition of the R.G. Dun & Company records, and other assorted materials, confirm that Winnipeg farm implement businesses were more quickly absorbed by Canadian national companies, with the result that Winnipeg farm implement firms after 1898 were dominated from cities outside of the Canadian prairies. Stores in Winnipeg were agents of, or owned by, manufacturers in Hamilton, Toronto, Ayr, Brantford, Smith Falls, Brockville, Orillia, Moline, Chicago, and so on. Decisions about products, costs, expansion, or liquidation were made not in Winnipeg but in Ontario, or the mid-western cities of the United States. Minneapolis agricultural implement firms, in contrast, developing during the same years as other national implement companies, maintained their share of the industrial and commercial market by forming their own manufacturing and distribution networks for the Upper Midwest. Except for one five year period, the number of regional implement firms in Minneapolis grew more quickly than did the national companies. Farm implement manufacturers such as Minneapolis Threshing Machine, Kinnard & Haines, and Minneapolis Steel & Machinery planned their own products to sell in the market of the Upper Midwest. This examination will consider the initiation of regional implement firms during the last quarter of the nineteenth century in Winnipeg and Minneapolis; the expansive growth of firms in the last decade of the nineteenth century and the first decade of the twentieth century; and finally, the rapid increase and contraction of implement companies in Winnipeg and Minneapolis from 1910 to 1925.

Railways in the 1870s and 1880s connected Minneapolis with an extensive hinterland stretching from Chicago through the Upper Midwest and along the Missouri River across the northern tier of the United States to the Rocky Mountains.³ Ten years behind



WINNIPEG HINTERLAND: RAILWAY MAP.

Adapted from "Railways Map," Atlas of Canada (Ottawa: Department of Mines and Technical Surveys, 1957), Plate No. 83.

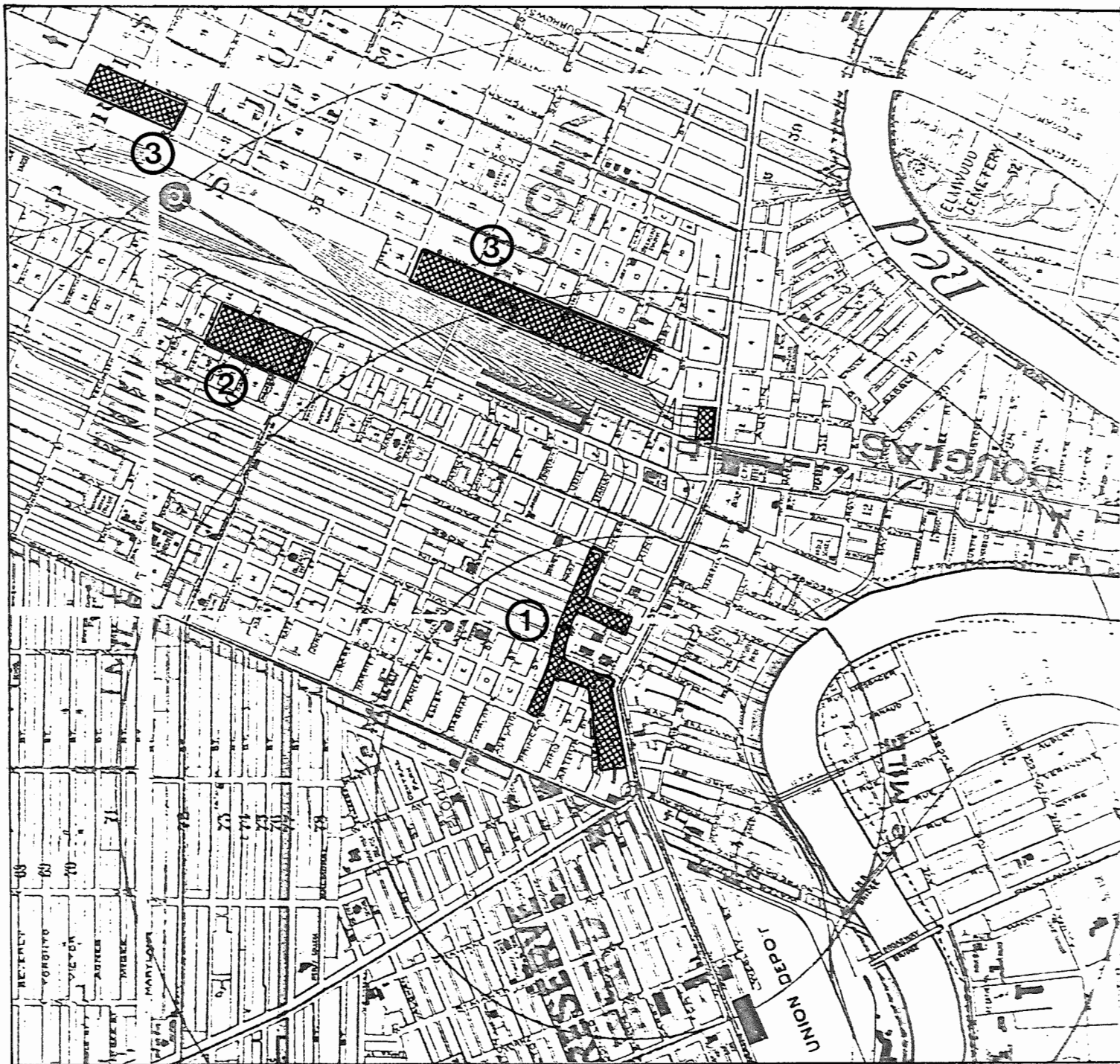


WINNIPEG HINTERLAND (2): TRADE CENTRES MAP.

the Minneapolis railroad development, Winnipeg became the gateway to a hinterland equally extensive between Ontario and the Canadian Rockies.⁴ The Upper Midwest railways put immigrant farmers on newly opened land to draw the grain products from these regions to be labeled and sold at Minneapolis. Manitoba railways in similar fashion, fanning outward like the rays of the sun, provided expectation that Winnipeg would become the immigrant depot and service center for the Canadian prairies, sending out farmers to till the soil, collecting their grain for sale, and providing manufactured goods to these new inhabitants.

As railway technology opened these east-west parallel linkages north and south of the border, farm implement technology produced functional, cost-efficient, labor-saving machines. From a modest beginning with locally made steel plows and reapers in the 1830s and 1840s, farm implement pools emerged in the 1870s and 1880s to produce better products to face the aggressive competition. The pooled technology produced reliable implement machinery that was revolutionary in terms of earlier labor-intensive farming methods. Better machines, lower prices, favorable railway rates, and easy credit made farm mechanization a necessity for survival.⁵ Therefore, the great amount of new western land being put into service during these years favored the rapid development of local and regional implement dealers providing the necessary machinery to tame these lands.⁶ Hardware merchants, blacksmiths, wagonmakers, and machinists recognized the demand for farm implements, and thus, developed their own products for local needs, purchased established lines from existing firms, or combined their own local products with imported lines.⁷ The predominant form of these local, and later regional firms was that of family ownership directly serving a local market.

Winnipeg and Minneapolis firms in the late 1870s manufactured and sold implements for a local market. Along Main and Princess Streets near the Winnipeg market, J.H. Ashdown Hardware, Dick and Banning Saw Mill, A. Grosvenor Implements, Thomas Lusted Carriages and Mulholland Brothers Hardware offered Manitoba farmers tools and machinery along with their other product lines.⁸ At the heart of Minneapolis on North First Street and Third Avenue North, and along North Washington Street an implement industry emerged. Monitor Plow Works, Minneapolis Plow Works, and Minneapolis Harvester Works manufactured and sold farm equipment. Christian and Dean, W.A. Shatto, C.E. Whelpley, Starkweather Hubbard, Brickford and Foster, and H. Kirkwood formed agencies to distribute implements to meet the growing demand. Although regional firms dominated local sales the aspiring national companies, H. Rubble of McGregor, Iowa; McCormick Harvester of Chicago; Pitts Agricultural Works from Buffalo; and C. Aultman from Canton, Ohio, also had opened agencies in Minneapolis by 1879 and provided competition from outside the Upper Midwest region.⁹

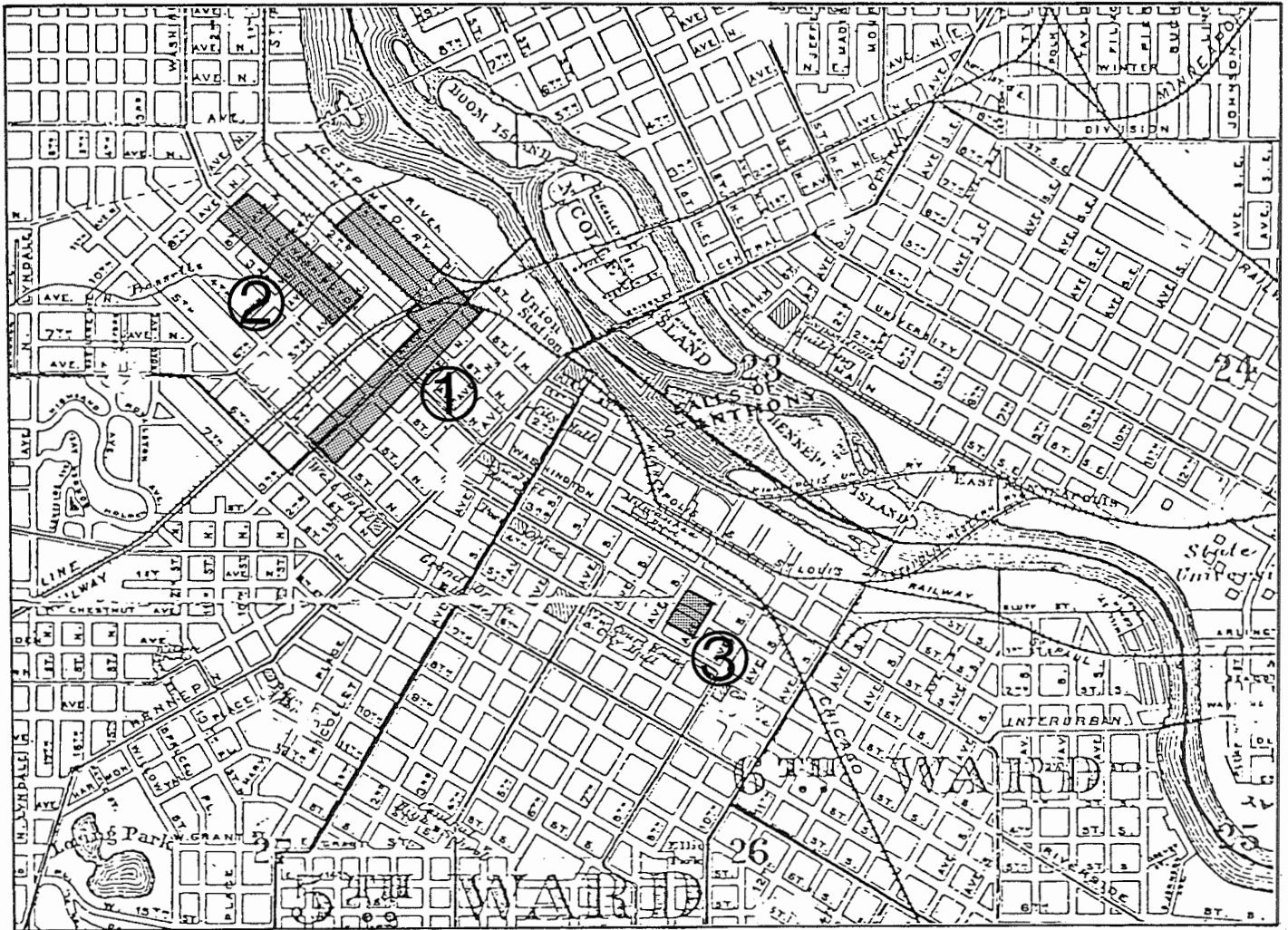


WINNIPEG : ESTABLISHMENT OF IMPLEMENT WAREHOUSE DISTRICTS

1. Warehouses established after 1880.
2. Warehouses established after 1900.
3. Warehouses established after 1905.

SOURCE : McPHILLIPS' MAP of the CITY of WINNIPEG, July 1910. Provincial Archives of Manitoba.

MINNEAPOLIS: ESTABLISHMENT OF IMPLEMENT WAREHOUSE DISTRICTS



1. Warehouses established about 1890.
2. Warehouses established about 1898.
3. Warehouses established about 1901.

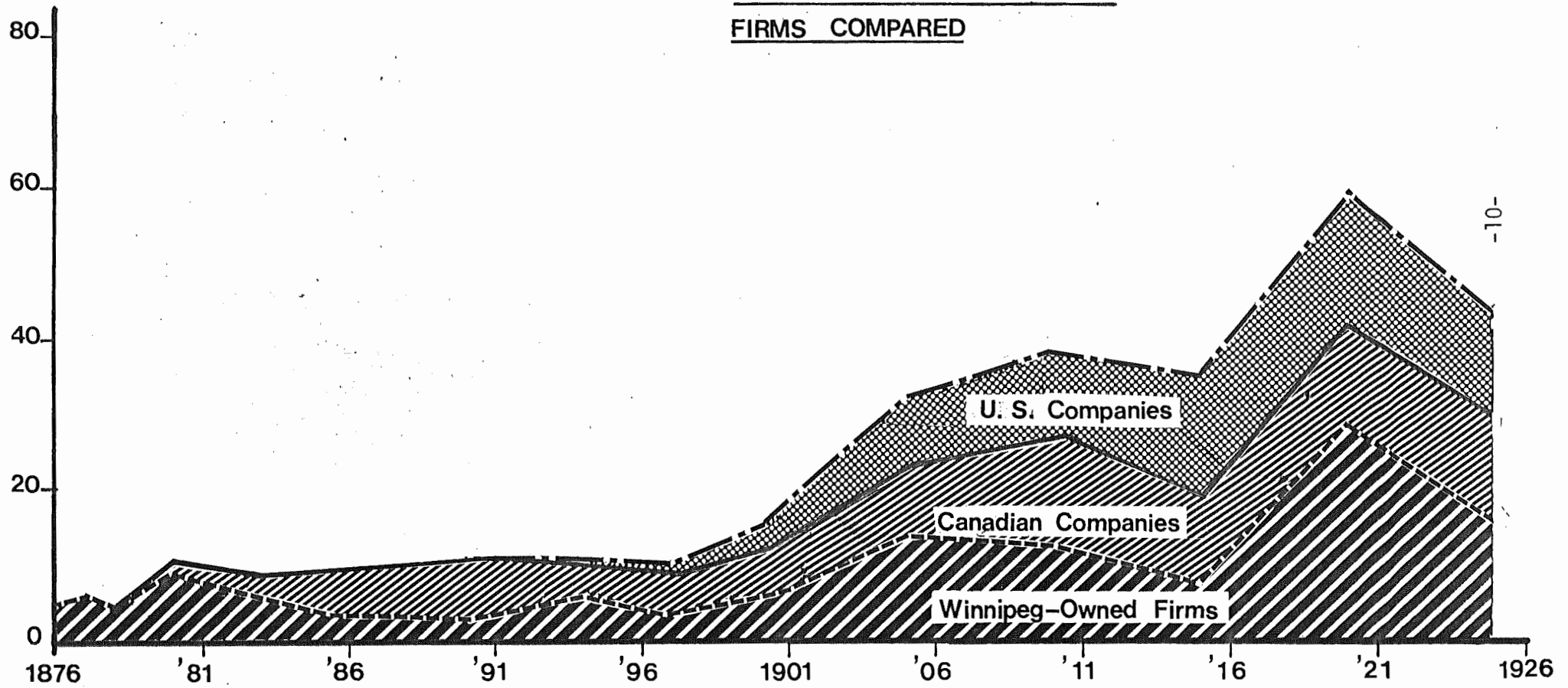
An abundance of high quality farm machines such as "the reaper, the reaper-mower, the self-raker, the harvester, and the binder," coupled with the economic recession that struck the United States in the early 1880s, provoked sharp competition for implement sales.¹⁰ The sales competition that resulted during the decade of the eighties was fought by means of patent purchases and patent thefts, law suits and patent pools, high pressure sales and misrepresentation, and the purchase of other firms to acquire their patent rights. During this decade of greater productive efficiency and sharp competition, the number of implement firms was trimmed from 1943 to 910 firms.¹¹

At the off-set of the 1880s, in great expectation of the coming railway connection with Eastern Canada, nine Winnipeg manufacturers and sales firms offered implements for sale to Manitoba's 62,260 inhabitants.¹² The most prominent was Ashdown Hardware, followed by two firms established for a number of years, Wesbrook & Fairchild and Edward Kelly; and two other firms newly listed by the R.G. Dun & Company as W.H. Disbrow and Haslam & Wilson. The Canadian harvester war of the 1880s and the economic recession of 1883-1884 collapsed a number of Winnipeg-owned firms which were without financial endurance.¹³ Only three locally-owned implement firms emerged from this financial crisis in the late 1880s: A.E. Fairchild, Van Allan & Agur, and H.S. Wesbrook. J.H. Ashdown returned to the hardware business exclusively.

Minneapolis population of 13,066 in 1870 jumped to 164,738 in 1890, stimulating the lumber, grain, and transportation industries.¹⁴ The implement firms of the late 1870s had expanded their factories and agencies to meet the needs of settlers opening up new acreage. Both local firms and companies with head offices outside the region increased their numbers threefold, and some expanded their assets as much. Such local firms as R.R. Howell, H. Kirkwood, Lindsay Brothers, Minneapolis Harvester Works, Minneapolis Threshing Machine, Monitor Plow Works, J.L. Owens, among twelve other firms, concentrated the Minnesota implement business in the hands of local business operators. Ten aspiring national companies, however, offered sharp competition: Advance Thresher of Battle Creek, Michigan; C. Aultman; J.I. Case of Racine, Wisconsin; John Deere of Moline, Illinois; William Deering of Chicago; Fuller and Johnson of Madison, Wisconsin; McCormick Harvester of Chicago; D.M. Osborne of Auburn, New York; Pitts Agricultural Works; and Walter A. Wood of Hoosick Falls, New York. Although these national companies had less than half the number of agencies in Minneapolis than the locally-owned firms, nevertheless in pecuniary strength, they exceeded by one third the smaller regional firms.¹⁵

As American companies, with headquarters along the east coast and in the midwest, soon entrenched themselves in the economic fabric of Minneapolis, Ontario companies wheeled along the tracks

WINNIPEG, 1876 - 1926.
NUMBER OF FARM IMPLEMENT
FIRMS COMPARED



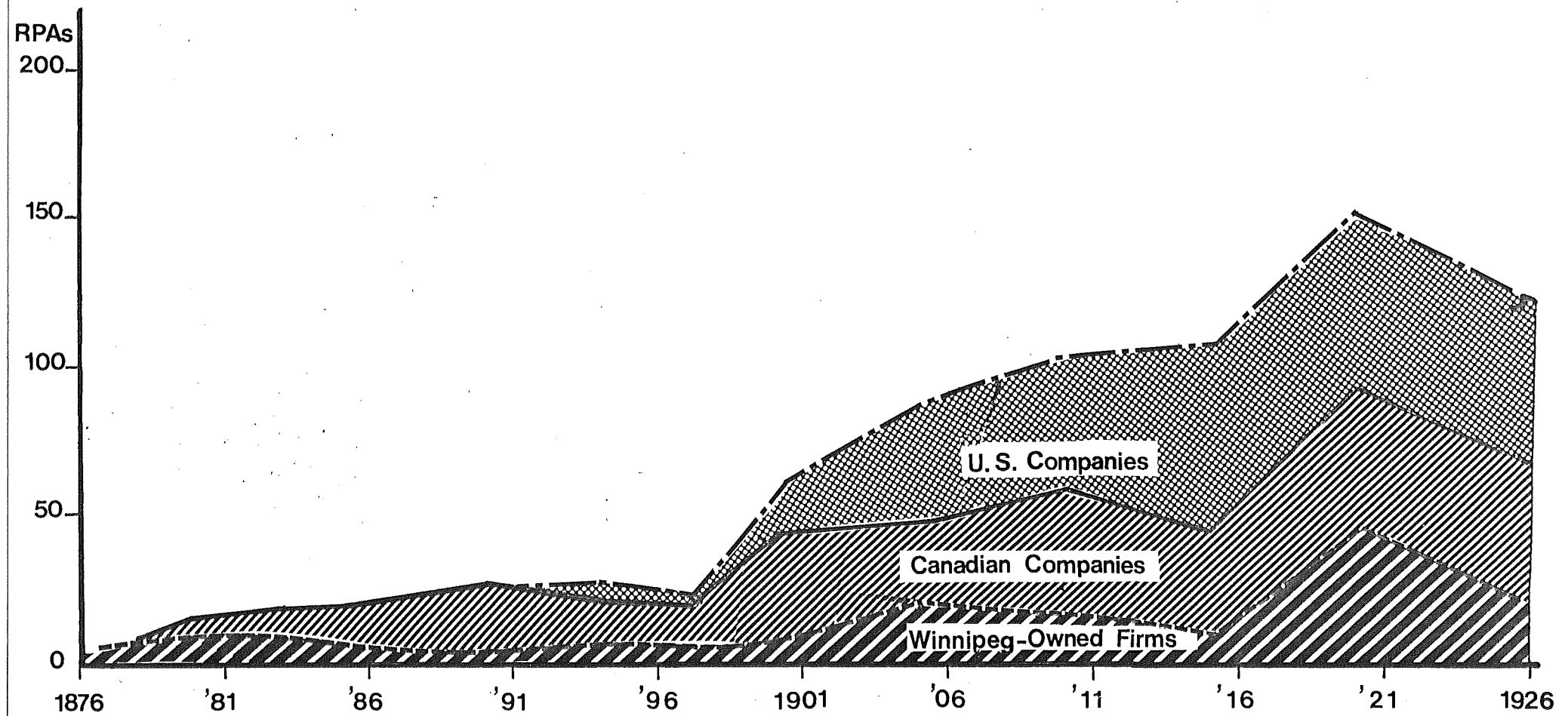
-10-

of the Canadian Pacific Railroad to Winnipeg to overwhelm the implement firms there.¹⁶ Eight Ontario manufacturers, among which were A. Harris of Brantford, Massey Manufacturing of Toronto, D. Maxwell of Paris, Watson Manufacturing of Ayr, John Elliot of London, and Chatham Manufacturing, aiming to expand their eastern markets to the Canadian west, opened stores in Winnipeg. During the decade of the 1880s these larger companies reversed completely the locally-based control of the Winnipeg implement industry so that at its end, the pecuniary strength of these Ontario companies grew to four times that of the local Winnipeg firms.¹⁷ Thus aspiring Canadian and American national firms during this decade established themselves in both cities. In Minneapolis, locally-owned industrial and commercial firms were numerous and large enough to compete successfully with the aspiring national companies which invaded the Upper Midwest. In Winnipeg, three locally-owned firms emerged from this decade with an established clientele, yet the aspiring national companies from Ontario had gained dominant control of the Winnipeg regional market.

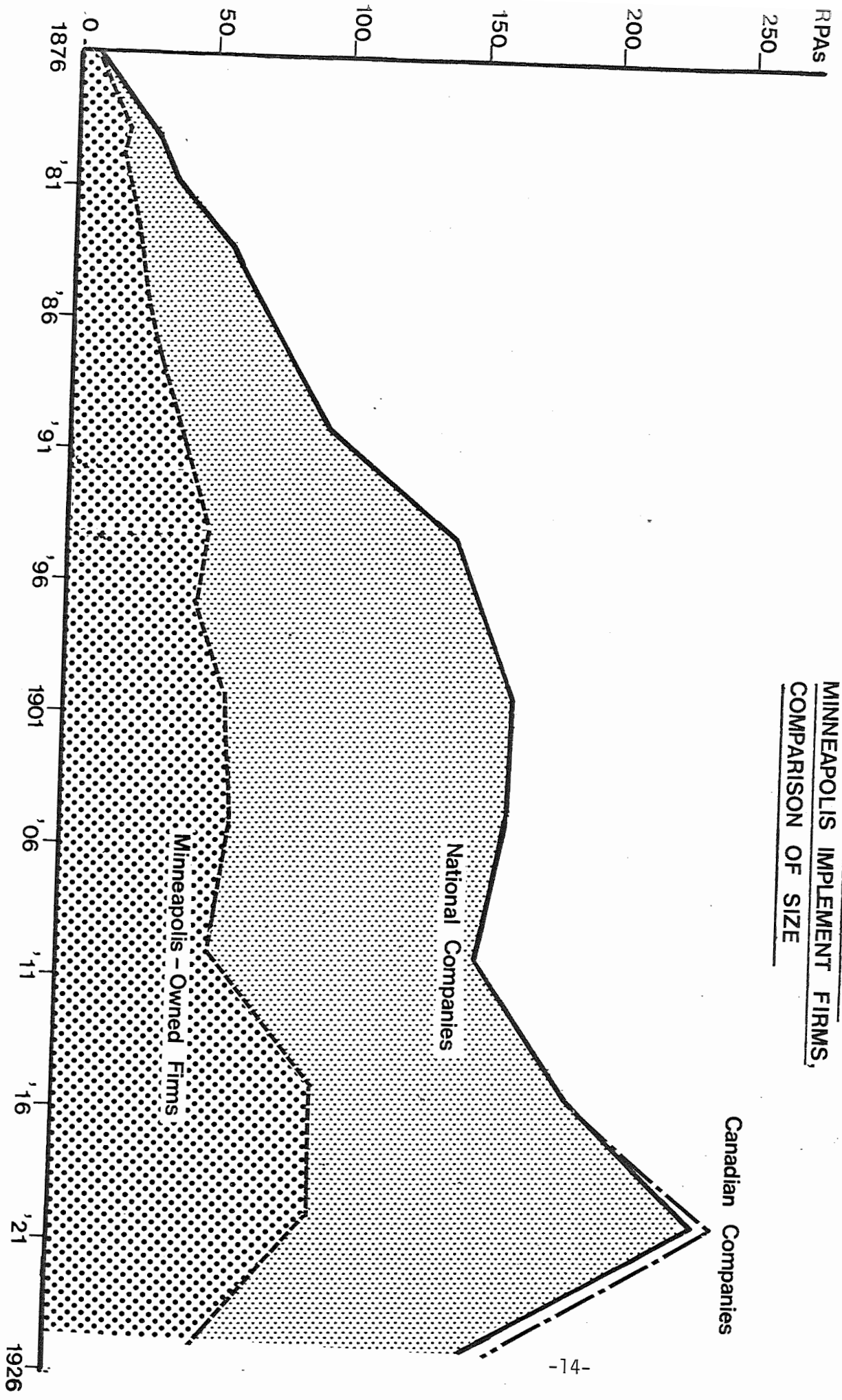
The implement firms of Minneapolis and Winnipeg during the American harvester war of the 1890s intensified their competitive edges. Although some firms went bankrupt during the panic of 1893 and the economic *crisis* that followed, many survived to enjoy fifteen years of sustained prosperity to the Great War. The stability of these years in Canada was initiated by the end of the Canadian harvester war with the amalgamation of two large and aggressive Ontario harvester firms, A. Harris and Massey Manufacturing companies,¹⁸ and by the commencement of freight rates favourable to Ontario industry.¹⁹ Other large and aspiring Ontario companies for the same reasons opened stores in Winnipeg: Frost and Wood of Smith Falls, Sawyer and Massey of Hamilton, Cockshutt Plow of Brantford and several lesser known companies. Geographically closer than Ontario and with excellent rail connections to Winnipeg, McCormick Harvester of Chicago crossed the border despite high tariffs to sell American machines in Manitoba. The cost advantage by this date had shifted away from Ontario branch stores to the benefit of American branch stores. Implement innovation remained with the American firms,²⁰ and many of the firms manufactured their equipment closer to the Canadian Prairies than did the Ontario firms. Again, American iron and steel at the end of the century was less expensive than British-Canadian iron and steel.²¹

Thus Winnipeg-owned firms such as Fairchild and H.S. Westbrook, maintained their share of the market by importing both American and Ontario implements. New Winnipeg dealers as Joseph Maw and H.F. Anderson opened stores and stocked an amalgam of products mostly from Ontario, but also with lines from the United States. Ontario branch stores in Winnipeg continued to sell implements at a high rate, and their combined credit ratings expanded to three times the pecuniary strength of the locally-owned stores.

DUN & BRADSTREET RATINGS
WINNIPEG IMPLEMENT FIRMS,
COMPARISON OF SIZE



**DUN & BRADSTREET RATINGS
MINNEAPOLIS IMPLEMENT FIRMS,
COMPARISON OF SIZE**



Thus Winnipeg implement stores controlled from Ontario were established during the 1890s to be ready for the great onrush of settlers to open up new farmland across the Canadian prairies at the turn of the century.²²

As Winnipeg dealers in the nineties prepared for the onrush, Minneapolis dealers provided implements for an already greatly expanded market. From 1890 to 1900 the number of Minneapolis firms increased by more than fifty percent from 37 to 62. Minneapolis dealers had the great advantage of being supported by a small but expanding machine industry. Monitor Plow Works, Minneapolis Plow Works, and Minneapolis Threshing Machine provided a regionally based machine industry around which smaller manufacturers and dealers could cluster.²³ Minneapolis sales agencies developed more rapidly in the 1890s than did implement manufacturing however. Dean, Downes, Gangelhoff, Janesville, Kinnard Press, Lindsay Brothers, Owens, Roberts, Robinson, Wood, and others maintained a thriving local industry that equalled the aspiring national companies in their number of establishments. Once the effort at market control by the harvester industry ended in the early 1890s with the collapse of the American Harvester Company, United States implement companies doubled their efforts to put together full-line companies which manufactured, sold, financed, and serviced their products throughout the nation.²⁴ Most companies, however, were still specializing in a few implement lines such as plows, threshers, harvesters, cutters, binders, seed drills, or a possible 48 other lines, and were not yet full line implement companies. By the close of the 1890s, 28 aspiring national companies had injected themselves into a Minneapolis market which supported 62 firms, including national thresher companies such as Advance Thresher and J.I. Case; national harvester companies such as Deering and McCormick; national plow companies such as Grand Detour, Rock Island, Deere and South Bend; and a national hay press company, the Kansas City Hay Press. Through this expansive and exciting decade, Minneapolis-owned firms, though about equal in number to the national companies, manufactured their own products and maintained under their own control over about 40 percent of the industry pecuniary strength against the powerful influx of national companies. Local Minneapolis manufacturers and dealers during the 1890s had protected their substantial share of the Upper Midwest market. Whereas during the same period Winnipeg dealers were inundated by Ontario-based implement companies and were therefore limited to running storefront operations.

Immigration into the Upper Midwest and the opening of new acreage tapered off by the beginning of the twentieth century, and thus, the Minneapolis implement business slowed its expansive growth pattern to moderate.²⁵ The Canadian prairies in contrast were just beginning their most extensive period of growth. Unlike the

indigenous implement industry in Minneapolis, however, the Canadian Pacific Railway and the branch stores of Ontario implement companies were dominant forces in the Winnipeg implement sales. As the Minnesota farmland was being opened, cleared, and planted for the first time, regional implement companies in the United States were only awakening to the possibility of national corporations which could be facilitated by developing national railway systems. Rather than sell patents to local manufacturers or sell implements to local agencies, the implement companies eager to expand their sales against sharp competition perceived the importance of a national manufacturing and sales network.²⁶ The advent of national corporations reaching out across the United States postdated the expansive growth of the Minneapolis implement business, but the existence of Canadian machine companies predated the most expansive period of the Winnipeg implement business. Canadian implement companies became part of Winnipeg's commercial growth from its very beginning, but American national companies arrived late on the scene of the Minneapolis implement manufacturing industry.

The first decade of the twentieth century saw nine hundred thousand immigrants arrive in Winnipeg, buy outfits to travel further west to open new land, and then, look to Winnipeg for added purchases of equipment.²⁷ Fourteen million acres were opened up across the Canadian prairie during this period.²⁸ Winnipeg implement firms more than doubled their number from 15 to 39 to meet the needs of settlers. Ontario and American national companies from the very beginning dominated the Winnipeg implement market. Fourteen Ontario companies, 12 Midwestern American companies, and 13 Winnipeg firms shared the market at the end of the first decade. Large American firms, such as American Seeding Machine of Springfield, Ohio; Garr Scott Threshing Machine of Richmond, Indiana; the newly formed International Harvester of Chicago; J.I. Case; Parlin and Orendorff of Canton, Illinois; M. Rumely of Laporte, Indiana; John Deere of Moline, Illinois; and Nichols and Shepard of Battle Creek, Michigan were rated by R.G. Dun & Company as having more than two and a half times the pecuniary strength of the combined local firms. Ontario companies, such as Cockshutt Plow of Brantford, Frost and Wood of Smith Falls, Sawyer and Massey of Hamilton, Tudhope-Anderson of Orillia, Massey-Harris of Toronto, and Waterloo Manufacturing commanded almost two and a half times the pecuniary strength of the locally-owned Winnipeg firms. Fairchild, William Eddie, Frankfurter and Sons, Stuart Machine, W. Johnston, Stewart-Nelson, and seven other local firms provided a small Winnipeg-owned implement sales business for Canadian prairie dwellers. During this decade of the most intense Winnipeg economic growth,²⁹ Ontario and American companies shared the farm implement growth almost equally in the number of operations and their combined financial strength. While Winnipeg firms had the same number of establishments as either the Ontario or American companies, their combined financial worth was approximately one third that of either the Ontario or the American companies.

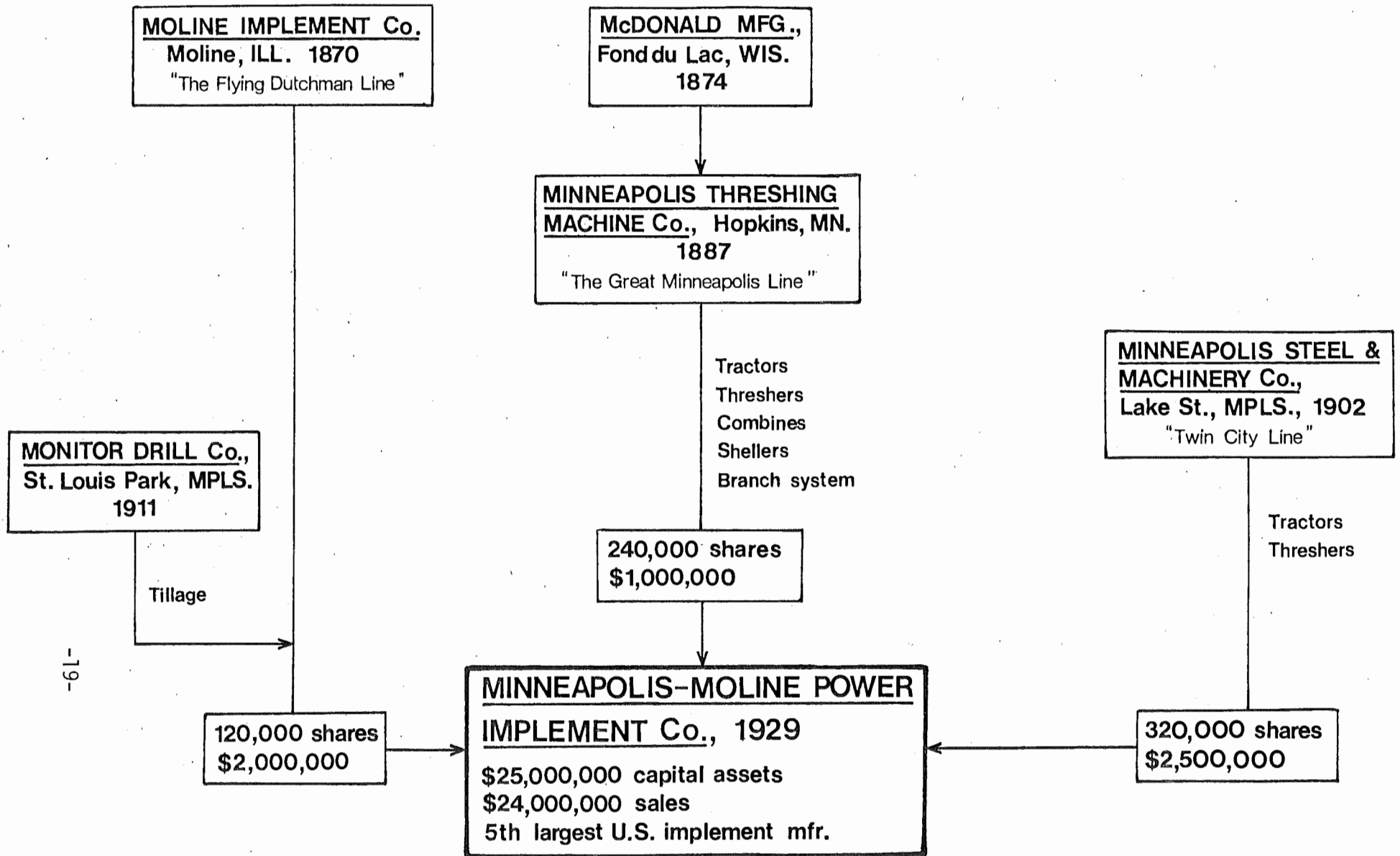
Minneapolis implement growth during the first decade of the twentieth century was steady but not as expansive as was Winnipeg's. Concentration of the American implement industry began radically in 1902 when "the five largest producers of harvesting machinery", McCormick Harvester; William Deering; Plano Manufacturing of West Pullman, Illinois; Warder, Bushnell & Glessner of Springfield, Ohio; and Milwaukee Harvester combined to form International Harvester Corporation. The following year three other firms, D.M. Osborne of Auburn, New York; Aultman-Miller of Akron, Ohio; and Minnie Harvester of St. Paul, Minnesota were also absorbed so that the new corporation controlled 85 percent of the American binder-mower market. United States implement companies expanded their product lines by acquisition through the next two decades of the twentieth century to attain a full line of implements and national sales outlets. In addition to International Harvester, John Deere acquired Syracuse Chilled Plow and Van Brunt Manufacturing of Horicon, Wisconsin, and then, emerged between 1910 and 1915 as a full line national corporation.³⁰ J.I. Case, Oliver, Allis-Chalmers and Minneapolis-Moline followed suit emerging as full line, national implement corporations by 1929.

This concentration meant that during the first decade of the century, the number of Minneapolis implement companies decreased from 62 to 56. The leading national companies like Advance Thresher; Aultman & Taylor of Mansfield, Ohio; Avery of Peoria; Buffalo Pitts; J.I. Case; Gaar Scott; Huber Engine and Thresher Manufacturing of Marion, Ohio; Nichols & Shepard; Reeves of Columbus; and Rumely expanded their manufacturing lines at home and their sales outlets throughout the American farmland. These national companies established in Minneapolis numbered twenty-six at the end of the first decade of the century. At the same time, 30 Minneapolis-owned firms controlled 38.6 percent of the implement industry pecuniary strength. Minneapolis Threshing Machine, Minneapolis Steel and Machinery, and Kinnard & Haines³¹ remained the driving force for the Upper Midwest farm machine technology, with other firms, Dean, Deere & Webber Downes, Emerson-Newton, Lindsay Brothers, and many lesser firms sharing in the benefits. National and locally-owned Minneapolis companies continued to improve their credit ratings through this decade. The first decade of the twentieth century increased the pecuniary strength of the Minneapolis industry, yet it was Winnipeg that enjoyed the more spectacular growth of its implement industry, reflecting an explosive prairie economy.

The last fifteen years which concern this investigation, 1910-1925, saw the growth of the Minneapolis implement industry accelerate rapidly in response to the wartime demands for agricultural products and to the motorization of the industry. Horses still powered agricultural machinery but at the expensive price of consuming one fourth of the annual grain crop.³² The invention of a light, mobile, and inexpensive tractor stimulated growing pains throughout the implement industry. The implosion of high technology into the industry demanded much greater expenditure for research, manufacture, finance, and sales of gasoline tractors along with a suitable line of implements. Company combinations and acquisitions became a greater imperative to possess the necessary technology, capital, and aggressive marketing program. Henry Ford in 1917-1918 introduced to the implement industry automotive efficiency and mass market by mass-producing a light, inexpensive field tractor well within the price range of the small farmer. He demonstrated that lower cost per unit could be achieved by longer production runs and by greater volume of sales.³³ Tractors on American farms thus increased rapidly from 1,000 in 1910 to 25,000 in 1915, to 246,000 in 1920, and to 549,000 in 1925.³⁴

Entering into the decade of the Great War, Minneapolis-owned companies outnumbered the 26 national companies in the Minnesota market, and during the last half of this decade, almost doubled the number of regional firms to reach the commanding lead of 54 companies in 1915 and 55 in 1920. National companies more modestly increased their establishments in Minneapolis by extending their numbers from 26 in 1915 to 33 in 1920. Two Canadian companies, Massey-Harris of Toronto and Sawyer-Massey of Hamilton, acknowledged the activity of the Minnesota implement business and the abolition of the United States tariff in 1918 by opening agencies in Minneapolis. The upswing of the Minneapolis implement industry reflected the upswing in the grain production to satisfy the demand for exports to Europe. Minneapolis, it was written, deserved the title "the Tractor City" as it was "the largest tractor manufacturing center in the country." A \$25,000,000 investment during the year 1917-18 had produced revenues of \$60,000,000.³⁵ It also reflected the expectation of easy profits as the gasoline tractor promised to revolutionize the industry.³⁶ The implement industry, however, awarded profits only to those companies that produced efficient units through advance design and production.³⁷ Many experimental tractors proved to be disastrous, and even the overwhelming success of the Fordson within seven years was challenged by International Harvester's all purpose, row-crop Farmall Tractor.³⁸

MINNEAPOLIS IMPLEMENT MANUFACTURING

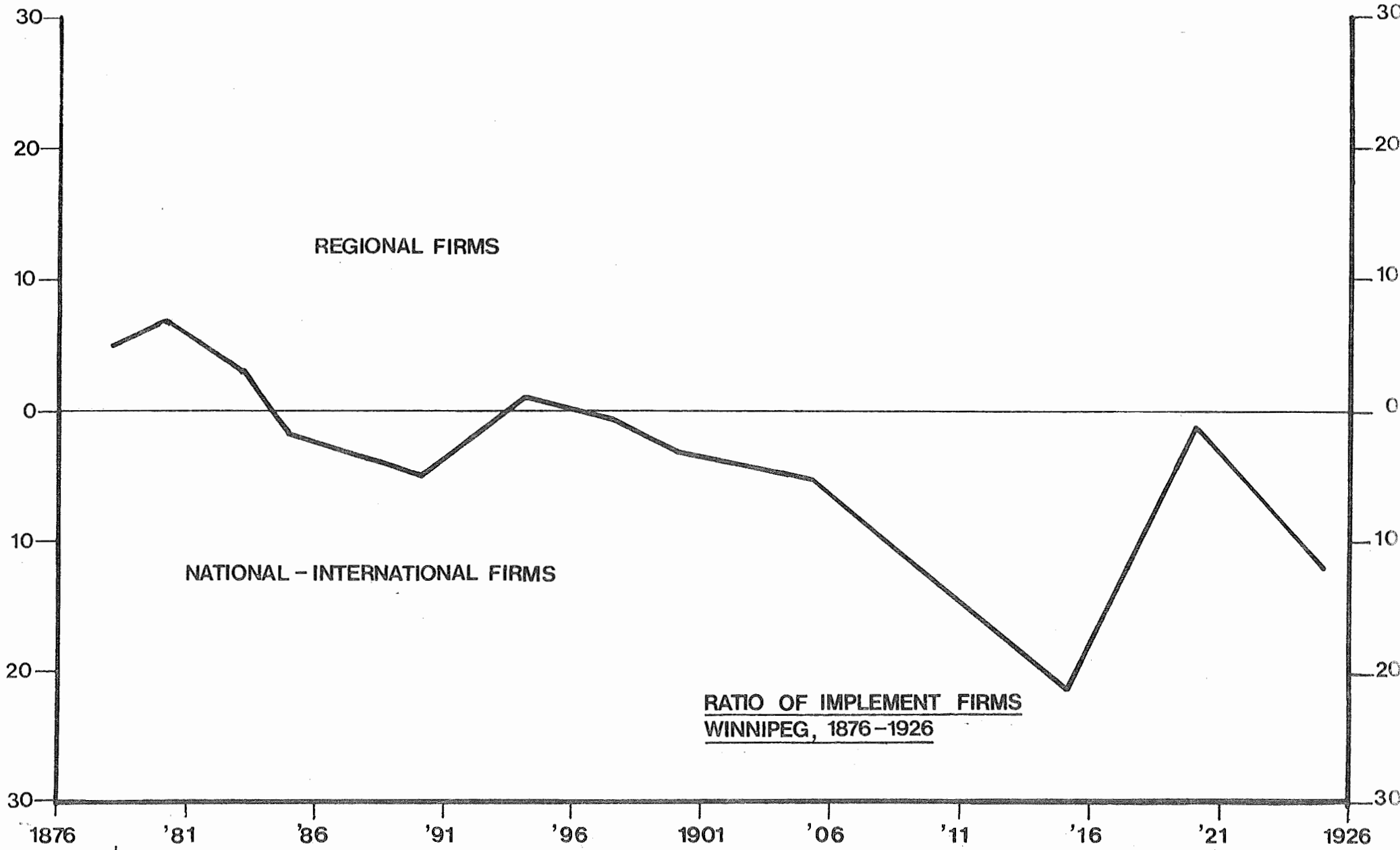


-19-

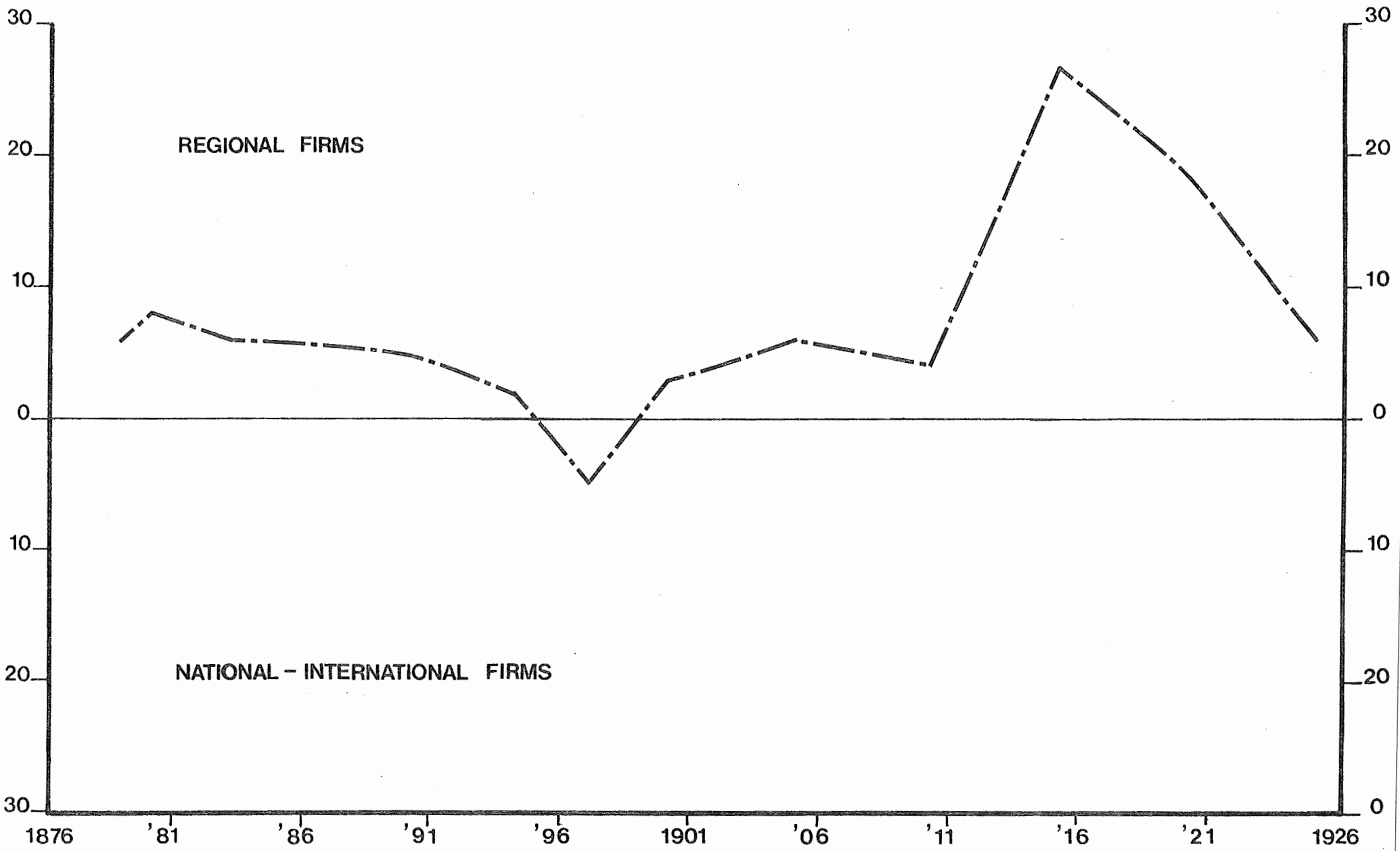
Minneapolis implement industry, clustering around Minneapolis Threshing Machine and Minneapolis Steel & Machinery, initiated its own tractor technology and maintained its share of the Minneapolis market. New firms were established that promised new machine technology, such as American Grain Separator, Bull Tractor, George Clark, Corn Belt Tractor, Disc Grader Plow, Hog Motor, M & M Tractor, Simplex Tractor, Standing Grain Thresher, and Wallis Tractor. Minneapolis-based firms competed well and seven of them extended their firms to Winnipeg. These locally-owned firms through their sheer superiority in numbers controlled 44.8 percent of the pecuniary strength of the Minneapolis implement industry during this fifteen year period.

By the 1920s national firms, through purchase of smaller companies, completed their full lines of implements, added efficient gasoline tractors, and fended off an economic recession in 1921.³⁹ Advance-Rumely of Laport, Indiana; J.I. Case; Emerson-Brantingham of Rockford, Illinois; R. Herschel Manufacturing of Peoria; Huber Engine and Thresher Manufacturing; Massey-Harris; Nichols & Shepard; Oliver Chilled Plow of South Bend, Indiana; and Russell of Massillon, Ohio offered efficient production of technically advanced farm machines through a national distribution network with outlets in Minneapolis. Minneapolis-based firms, outnumbering the national company outlets 31 to 25 in 1925, nevertheless maintained vigorous manufacturing and sales throughout the Upper Midwest, and enjoyed 35.5 percent of the pecuniary strength of the Minneapolis implement industry.

Winnipeg's implement business, in contrast to the expansive commercial activity during the war and the postwar period of the Minneapolis implement scene, experienced a recession at the beginning of the war which was followed by a postwar bubble that rose sharply, and after 1920, subsided quickly. Between 1910 and 1914 one half million Americans marched merrily north across the border to file forty per cent of the homestead claims, and carried with them one billion dollars over a ten year period to invest in their new homesteads.⁴⁰ The Canadian tariff was reduced from a high of 35 percent in 1894 to 10-15 percent in 1914, and was terminated for small tractors in 1918.⁴¹ Minneapolis implement companies therefore extended their influence northwest to Winnipeg, opening stores in considerable numbers. A bounteous crop brought on by the excellent weather of 1915 gained high prices on the market.⁴² The resulting optimism provoked a run on farm implements which were quickly sold out.⁴³ By 1915 the seventeen American companies outnumbered either the eleven Ontario companies, or eight locally-owned firms in Winnipeg. The American firms in Winnipeg represented more than twice the pecuniary strength of either regional or Ontario companies. To the established companies in the Winnipeg market, as John Deere which absorbed Fairchild in 1908, J.I. Case, Avery, International Harvester, Rumely, and Nichols & Shepard were added Minneapolis Threshing Machine, Hog Motor, Gregg, Twin City Separator, and Crane & Ordway. Canadian firms without a usable gasoline tractor



RATIO OF IMPLEMENT FIRMS
MINNEAPOLIS, 1876 - 1926



struggled to maintain their share of the market against the expansive pressure from south of the border. Massey-Harris would purchase in 1927 the J.I. Case Plow Company plant in Racine to acquire the Wallis tractor and to extend their outlets in the United States.⁴⁴ Cockshutt and Sawyer-Massey proved to be equally successful in expanding markets in Western Canada and abroad. Smaller Ontario firms with Winnipeg branches, Beatty Brothers of Fergus, B. Bell of St. George, R. Bell Engine and Thresher of Seaforth, William Galloway of Toronto, MacDonald Thresher of Stratford, Tudhope-Anderson of Orillia, and John Watson of Ayr struggled to maintain sales. Winnipeg regional firms, William Eddie, Hero Manufacturing, C.S. Judson, McClelland Stoker, John F. McGee and several other firms stayed alive as small manufacturers or as sales agents of the national companies. As the Great War ended and food supplies were greatly needed in Europe, the highest price for prairie wheat was reached between \$2 and \$2.51 a bushel. The Winnipeg industry in the same year responded to the economic excitement by tripling the number of implement operations in 1920.⁴⁵ Christiansen Implements, Favorite Thresher, J.D. Adshead, Anderson-Roe, A.L. Ashdown, G.L. Dodds, MacLeods, Henry Rustad, Tractioneers, United Grain Growers, West-Woods and other dealers rushed to open shops that brought the total to 30 local Winnipeg implement dealers.⁴⁶ Three Ontario engine companies, Waterloo Manufacturing, Fairbanks-Morse, and Gilson Tractors, also opened stores northwest of the Winnipeg city centre to increase the number of Ontario agencies to thirteen. American companies retained seventeen Winnipeg establishments, including three new Minneapolis companies, Gray Tractor, Minneapolis Steel and Machinery, and Richardson Grain Separator. R.G. Dun & Company rated the combined pecuniary strength of the 30 Winnipeg-owned firms as about equal to the Ontario companies and slightly less than the American companies doing business in Winnipeg. The first half of the year 1920 was the high point of Winnipeg involvement in the implement business. Yet even at this time, the number of Ontario and American companies were equal to the number of Winnipeg firms, and their pecuniary strength exceeded the Winnipeg firms by more than two times.

As European agriculture after the Great War recovered to supply its own needs, the North American grain bonanza subsided and the price per bushel dropped from the high of \$2.85 in 1920 to a low of 81¢ in the following year. Canadian banks therefore tightened credit, factories shut down, and by 1924, one third of Canadian farmers verged on bankruptcy. Immigration then changed direction with one half million Canadians abandoning farms to march solemnly south in hope of a stronger economy.⁴⁷ The implement business reflected this downturn. Winnipeg-owned firms contracted from 29 to 16 firms by 1925, but McLeods, Robinson-Alamo, F.C. Wright, Favorite Thresher Supply, Canadian Farm Implement, Ronald-Smith Cultivator, and Northern Implement offered promise for the future. Ontario companies remained the same in number to 1925 while the American companies were reduced from 20 to 15 operations. Confirming the contraction of Winnipeg firms, R.G. Dun & Company at the quarter

century mark rated the pecuniary strength of the Winnipeg-based firms as having diminished by half, whereas the strengths of Ontario and the American companies remained constant. Outselling Winnipeg companies at that time were the Regina implement companies, more centrally located at the heart of the Canadian grain growing belt.⁴⁸ Except for occasional spurts of activity, the Winnipeg implement business was dominated since the 1880s by outside companies from cities in Ontario of the United States. Winnipeg dealers sold equipment manufactured elsewhere, and if they proved to be successful, might be taken over by a national company as was Fairchild. During this fifty year period, despite a volatile trade in implements, Winnipeggers were not able to generate an indigenous implement manufacturing industry, as the tariffs, freight rates and efficiency of outside industry militated against it, and therefore, Winnipeg remained an outpost of the implement industry in Canada and the United States.

The Minneapolis machine industry, in contrast, before it was invaded by the national corporations established an indigenous implement industry. This was made possible by favorable freight rates, a large well-settled hinterland, and the stimulus of tractor power. While other cities were developing manufacturing and distribution systems, Minneapolis developed its own implement business and established its industrial base in order to move with, rather than in the wake of, other national companies. By contrast, fifty years before Winnipeg sprang into action as the grain center of the Canadian prairies, the Ontario machine industry had already established the production of farm implements. When the prairie agricultural industry gained momentum, Ontario implements were quickly supplied on the flatcars of the Canadian Pacific Railway to the Winnipeg market, to smother the first beginnings of an indigenous machine industry. For the benefit of Ontario manufacturers and to the chagrin of the Americans, the western Canadian market was protected by a high tariff until 1907, and then a moderate tariff until 1924. These factors placed Ontario implement companies from the beginning firmly in control of the rapidly expanding Winnipeg implement business. Ten years after the Ontario companies established control over Winnipeg implement sales, United States implement companies moved their outlets into Winnipeg and reinforced outside control of the industry. This meant that cities outside Manitoba decided from the beginning the direction that the Winnipeg implement industry would take. Unlike Minneapolis, the discrimination of the Canadian railway rates discouraged local manufacturing and perpetuated the dominance of out-of-province implement makers over the Winnipeg market. Unlike Minneapolis, the control by out-of-province cities over the direction of the Winnipeg implement firms had from the very beginning inhibited the development of an indigenous machine industry.

From the end of the 1890s the manipulation of the Winnipeg implement industry by outside linkages demonstrated how this sector of the city economy was, at an early stage of its development, integrated into Canadian

urban system. Ontario firms determined the style and price of farm implements merchandised in Winnipeg; Montreal and Ottawa officials set the freight rates to and from the Winnipeg market; and Ottawa politicians decided the extent of tariff protection for the benefit of Ontario sales in Winnipeg. The direction of the Winnipeg implement industry was clearly determined by eastern politicians and businessmen who linked to eastern industrial production the distribution outlets of this western city. Winnipeg's integration into the Canadian urban system, as indicated by the implement industry, occurred very early in the city's history and was very extensive in degree.

The implement industry of Minneapolis reveals just the opposite about that city. The local implement industry was established early in its history and resisted absorption by national corporations established at the same time in other United States cities. Through this fifty year period the Minneapolis companies manufactured almost half of the implements sold, giving control of this sector of the city to local Minneapolis politicians and businessmen. Local banks and railway offices made local decisions to support regional advantage. The Minneapolis implement industry indicates that the city fostered its own internal growth, and successfully resisted extensive and quick integration into the American urban system.

FOOTNOTES

FOOTNOTES

1. James W. Simmons in "The Organization of the Urban System," Systems of Cities: Readings on the Structure, Growth and Policy, ed. by L.S. Bourne and J.W. Simmons (New York: Oxford University Press, 1978), pp. 65-67, outlines among other models two appropriate to this essay, the Staple Export Model and the Industrial Specialization Model. Winnipeg's farm implement firms developed along the lines of a staple export economy; that is, an economy fuelled by one staple product and supplied by goods from an outside source. The Minneapolis implement industry in contrast followed the second model, developing in addition to regional links, which was true for Winnipeg, its own internal specialized industries. See also Allan Pred for a further exposition of the linkages of urban systems in City-Systems in Advanced Economies: Past Growth, Present Processes and Future Development Options (London: Hutchinson, 1977), pp. 13-18; and Leonard O. Gertler and Ronald W. Crowley, Changing Canadian Cities: The Next 25 Years (Toronto: McClelland and Stewart, 1977), pp. 105-164.
2. Henderson's Winnipeg City Directory (Winnipeg: Henderson Directories Limited, 1876) and Davidson's Minneapolis City Directory (Minneapolis: C. Wright Davidson, 1876) have supplied the basic names of firms for enumeration. The directories are not absolutely accurate but do provide an excellent starting point for counting. Directory information was supplemented by R.G. Dun & Company listings and by Corporations Branch files as found in Manitoba and Minnesota government offices.
3. By the decade beginning in 1880, "the commercial and industrial interests of St. Paul and Minneapolis" had established themselves "as the nucleus of the economic life of the Northwest" for marketing, distribution, and culture, as "the metropolitan center" for this region (Mildred L. Hartsough, The Twin Cities As A Metropolitan Market [Minneapolis: University of Minnesota, 1925], p. 16).

The rays of this economic nucleus were the many railroads emanating outward. "From 1887 on, the situation for Minneapolis-St. Paul as to the railroad lines was favorable; there were at that time 6 lines running from the Twin Cities to Chicago and the Atlantic coast; 4 to St. Louis; 4 connected with the transcontinental lines at Kansas City, St. Joseph, and Omaha; 4 ran to Lake Superior; there were two connections with the Pacific coast; and 10 lines ran into the agricultural districts of Minnesota, Iowa, Nebraska, and the Dakotas" (Hartsough, p. 95).

Robert H. Wiebe in The Search for Order, 1877-1920 (New York: Hill & Won, 1967) points out the contribution of railroads and implements toward the end of the nineteenth century: "Railroads, machinery, and scientific advances opened more farmland in the last third of the century than in the nation's previous history" (p. 15). Standardization of the track gauge at 4'8" provided the basis for a national railway system (pp.22-23).

4. By 1911 twenty-four railroad lines "radiated out from Winnipeg, conferring upon the city a commanding position in Prairie trade" according to Ruben Bellan in Winnipeg's First Century: An Economic History (Winnipeg: Queenston House Publishing Co., 1978), p. 100. Also see, W.L. Morton, Manitoba: History (Toronto: University of Toronto Press, 1973), pp. 200-233; and Northwest Farm Equipment Journal, III (September 1889), p. 77.
5. William G. Phillips, The Agricultural Implement Industry in Canada: A Study of Competition (Toronto: University of Toronto Press, 1956), pp. 5-12. Norman F. Thomas points out that implement prices decreased from 1868 to the end of the nineteenth century in Minneapolis-Moline: A History of Its Formation and Operations (New York: Arno, 1976), p. 77.
6. Hiram Drache in The Day of the Bonanza (Fargo: North Dakota Institute of Regional Studies, 1964) states that "The low man-land ratio, so typical of frontier areas, put particular emphasis on mechanization at a time when many new labor-saving devices were being introduced... Labor scarcity, which forced mechanization, demanded a great deal of capital to purchase the equipment and meet the payroll when necessary" (p. 7).
7. Phillips, p. 38.
8. Henderson's Winnipeg Directory. The Commercial, IX (1890-1891), 809-12, records that Winnipeg implement firms were located "on Market, Princess and William Streets, facing on the square" in "handsome premises". The firms did a lively business in cash and credit. At first American implements manufactured in the west were better suited to the Canadian prairies than Eastern Canadian machinery, but by 1891 Canadian implements outsold those from south of the border.
9. Northwest Farm Equipment Journal, 15 (December 28, 1901), 40-42; Davidson's Minneapolis City Directory.
10. Phillips, pp. 11-12.
11. According to Earle D. Ross the revolution in farm technology consisted much more in entrepreneurial expertise than mechanical, that is to say in "high pressure, salesmanship with unscrupulous misrepresentation, price cutting, ... abusive advertising, long court battles, ineffective pooling arrangements." ("Retardation in Farm Technology Before the Power Age," Agriculture History, XXX [January 1956, 12.] Phillips, p. 12)
12. D.G.G. Kerr, Historical Atlas of Canada (Don Mills, Ontario: Thomas Nelson, 1975), p. 86.
13. "The harvester war in Canada was waged between the Massey and the Harris firms for leadership in the Canadian binder trade. It reached its peak during the eighties, some ten years before its [American] counterpart between McCormick and Deering firms in the United States" (Phillips, p. 43).

14. Nelson, Lowry et al., A Century of Population Growth in Minnesota (Minneapolis: University of Minnesota Agricultural Experimental Station, 1954), pp. 5 and 35:

| <u>YEAR</u> | <u>MINNEAPOLIS POPULATION</u> | <u>MINNESOTA POPULATION</u> | <u>MINNESOTA INCREASE</u> |
|-------------|-----------------------------------|---------------------------------|-------------------------------|
| 1870 | 13,066 | 439,706 | 155.6% |
| 1880 | 46,887 | 780,773 | 77.6% |
| 1890 | 164,738 | 1,310,283 | 67.8% |
| 1900 | 202,718 | 1,751,394 | 33.7% |
| 1910 | 310,408 | 2,075,708 | 18.5% |
| 1920 | 380,582 | 2,387,125 | 15.0% |
| 1930 | 464,356 | 2,563,953 | 7.4% |

Minnesota Commissioner of Statistics, 1891 (Minneapolis: Harrison and Smith State Printers, 1892), p. 10:

MINNESOTA AGGREGATE AND AVERAGE YIELD OF WHEAT DURING
TWENTY YEARS FROM 1870

| <u>YEAR</u> | <u>ACRES SOWN</u> | <u>BUSHEL WHEAT PRODUCED</u> | <u>AVERAGE PER ACRE</u> | |
|---------------------------|-------------------|--------------------------------------|-----------------------------|-------|
| 1870 | 1,019,744 | 15,372,941 | 15.07 | |
| 1871 | 1,096,578 | 13,467,300 | 12.28 | |
| 1872 | 1,267,309 | 22,059,375 | 17.40 | |
| 1873 | 1,548,713 | 26,402,485 | 17.04 | |
| 1874 | 1,681,830 | 23,938,172 | 16.03 | |
| 1875 | 1,764,109 | 30,079,300 | 17.05 | |
| 1876 | 1,869,172 | 17,964,632 | 9.61 | |
| 1877 | 1,829,167 | 30,693,969 | 16.79 | |
| 1878 | 2,365,775 | 29,484,503 | 12.50 | |
| 1879 | 2,762,521 | 31,218,634 | 11.30 | |
| 1880 | 2,961,842 | 39,399,068 | 13.30 | |
| 1881 | 2,884,160 | 32,947,570 | 11.42 | |
| 1882 | 5,329,969 | 32,176,258 | 13.81 | |
| 1883 | 2,507,209 | 36,042,672 | 14.37 | |
| 1884 | 3,109,874 | 50,475,017 | 16.23 | |
| 1885 | 3,043,683 | 41,253,888 | 13.55 | |
| 1886 | 3,319,701 | 52,492,523 | 15.80 | |
| 1887 | 3,053,987 | 39,070,159 | 12.70 | |
| estimated by assessors | 1889 | 2,921,437 | 46,660,583 | 15.90 |
| | 1889 | 2,736,519 | 42,334,570 | 15.30 |
| | 1890 | 3,078,787 | 40,298,142 | 13.00 |

15. The Mercantile Agency Reference Book Containing Ratings of the Merchants, Manufacturers, and Traders (New York: R.G. Dun & Company, 1876 -1926) provides the estimated "pecuniary strength" of firms in Winnipeg and Minneapolis since 1876. This meant that unpaid Dun agents collected data on the financial strength of firms in their respective cities, and sent reports to the R.G. Dun & Company head office in New York City, where the material was compiled and printed in rating books. Printed rating books on Canadian firms are to be found in Dun & Bradstreet offices in Toronto, and on American and Canadian firms in the New York head office.

The well-known merchant and abolitionist, Louis Tappan, founded the Mercantile Agency in New York City in 1841-42. R.G. Dun took over leadership in the company in the 1860s, and by the 1880s, 2,580 written ledgers were accumulated giving biannual ratings. Information was collected especially on the small, unstable companies of the west, but information was also collated on established companies in the east.

Reports on businesses included information on partnerships, dates of company formation, real estate holdings, business associations, and an individual's moral standing (associations, church, political party, and mores). This was a confidential assessment and would be read to clients only. The service proved to be satisfactory and by 1900, over one hundred and thirty offices existed in American, Canadian, and European cities. Reference books were then issued quarterly in desk and pocket editions. R.G. Dun & Company merged with the S. Bradstreet Agency in 1933.

Although the company tightened the method of its reporting in the twentieth century, it was criticized for inaccurate assessments which gave large firms high credit ratings (AA, or A) and small firms low credit ratings (D through M) without reference to their reliability as business firms. The accuracy of the information supplied to creditors was found, therefore, not always to be reliable.

For the purpose of this article the "pecuniary strength" rating of the R.G. Dun & Company has been altered to meet the needs of this research with the result that seventeen letter ratings, often with negligible differences, have been simplified to five consistent number ratings. The rating of local firms, therefore, can be averaged and contrasted with the averaged rating of out-of-city companies. The system used here to compare locally-owned firms with aspiring national companies resembles the university system of the Grade Point Average with the rating being made one-to-five rather than one-to-four.

See D.A. Muise, "The Dun and Bradstreet Collection: A Report", Urban History Review, February, 1975, 23-26; Michael Katz, "The Entrepreneurial Class in a Canadian City: The Mid-Nineteenth Century", Journal of a Social History, Winter 1975, 1-29; Bertram Wyatt-Brown, "God and Dun & Bradstreet, 1841-1851", Business History Review 40 (Winter 1966), 432-50; James H. Madison, "The Evolution of Commercial Credit Reporting Agencies in Nineteenth Century America", Business History Review 47 (Summer 1974), 164-86.

16. Canadian Pacific Railroad first made rates favorable to Winnipeg wholesalers in 1886, by lowering the rate by fifteen percent. Further rate discrimination to Winnipeg's advantage as opposed to Portage, Regina, and Calgary followed by 1890 (Donald Kerr, "Wholesale Trade on the Canadian Plains", The Settlement of the West, ed. by Howard Palmer [Calgary: University of Calgary, 1977] p. 145.)
17. Bellan, p. 56.
18. E.P. Neufeld, A Global Corporation: A History of the International Development of Massey-Ferguson Limited (Toronto: University of Toronto Press, 1969), pp. 17 and 19.
19. Vernon C. Fowke, The National Policy and the Wheat Economy (Toronto: University of Toronto Press, 1978), p. 54.
20. "Almost all of the major technological innovations that the companies had to acquire came from the United States" (Neufeld, p. 17). "The leading implement firms in Canada in the nineteenth century owed much of their success to the connections they were able to establish with American firms, permitting them to produce in Canada implements already being produced in the United States. ... none of the leading Canadian firms came into being solely to exploit an invention or an innovation of its founder... for all complex implements Canadian manufacturers depended exclusively on American designs and patents" (Phillips, p. 38).
21. Canadian farm implement companies originally had the cost advantage over American companies for sales in Canada. Small tool and implement companies were established in "all the principal towns and cities in Upper Canada", having the advantages of being at their market, of lower costs for iron, steel, and labor, and after 1847, of tariff protection. Canadian companies, however, lost the cost advantage in the early 1870s when United States steel dropped in price because of the Bessemer process, and Ontario implement manufacturers discovered their factories to be at least twelve hundred miles from the new market opening on the Canadian prairies (Phillips, pp. 9-10 and 44).
22. The number of Canadian prairie farms between 1901 and 1911 increased by more than two and a half times; more precisely by 125,000 farms. The subsequent ten years, however, saw a diminishing growth rate, in which less than half that number of new farms were established (60,000) (Fowke, pp. 73-75).
23. The blacksmith, C.K. Perrine, and the inventor, Samuel T. Ferguson, incorporated the Monitor Plow Company in 1872 and produced a gang plow, horse rake, and walking plow. Ferguson in the 1880s was a director of the Minneapolis Plow Works, "the largest plow factory west of the Great Lakes" according to Merrie E. Jarchow in The Earth Brought Forth: A History of Minnesota Agriculture to 1885 (St. Paul: Minnesota Historical Society, 1949), pp. 139-40. Also see Isaac Atwater, History of the City of Minneapolis (New York: Munsell, 1893), II, 652-53 and Rev. Marion Daniel Shutter, ed., History of Minneapolis: Gateway to the Northwest (Minneapolis: S.J. Clark, 1923), I, 381-82.

Norman F. Thomas provides an interesting account of the Canadian contribution to the development of the Minneapolis Threshing Machine Company. Two Canadian-born presidents of MTM, John S. McDonald of Lancaster and F.E. Kenaston of Hartley, Quebec, directed its development for thirty-three years which saw the development of the "Victory" separator, the steam threshing machine, and the gasoline tractor (pp. 197-98). MTM was known for "The Great Minneapolis Line".

Minneapolis Steel and Machinery Company (MS & M) was formed in 1902 from three Minneapolis firms. It was more aggressive than its local competitors and quickly produced a gasoline engine in 1905, a tractor in 1912, manufacturing 4,500 light Bull Tractors by 1914, and formed the Twin City Company to distribute the new "Twentieth Century" 15 horsepower tractor (pp. 23-53).

24. Phillips, p. 15.

25. See Footnote 14.

26. Phillips analyzes the three principal factors in the stabilization of the implement market in the 1890s and the consequent formation of national companies to be: (1) geographic specialization of manufacturing according to the type of crop produced, (2) centralized manufacturing for a national market replacing the granting of patents to local firms, and (3) improvement and extension of sales agencies throughout the farm belts (p. 12). Gregory S. Kealey describes the growth of Toronto industrialization from the 1860s to the 1880s in Toronto Workers Respond to Industrial Capitalism, 1867-1892 (Toronto: University of Toronto Press, 1980), pp. 18-34.

27. C.A. Dawson and E.R. Younge, Pioneering in the Prairie Provinces: The Social Side of the Settlement Process (Toronto: Macmillan of Canada, 1974), p. 28. Alan F.J. Artibise provides an excellent analysis of Winnipeg's population increases and provides the following data in Winnipeg: A Social History of Urban Growth, 1874-1914 (Montreal: McGill-Queen's University Press, 1975), pp. 130-34.

28. Fowke, P. 73.

29. W.L. Morton in Manitoba: A History outlined the fourfold expansion of Winnipeg manufacturing during the first decade of the twentieth century from a 13 million dollar product to a 54 million dollar product (p. 304). Increasing at a faster rate than manufacturing, however, was the grain trade in Winnipeg. The number of grain cars inspected during this same period increased more than five times from 14,886 to 81,506 according to the Annual Reports of the Winnipeg Board of Trade, Provincial Archives of Manitoba.

30. Phillips, pp. 12-14; Thomas, pp. 1-3 and 293.
31. O.B. Kinnard of Kinnard and Haines pioneered the development of tractors in Minneapolis. After rebuilding an unsatisfactory Otto Tractor, Kinnard constructed a single cylinder gasoline engine with steam engine-style running gears. In 1897 Kinnard and Haines built "the first successful gas tractors" sold in the Northwest. A two cylinder engine served from 1902 to 1907 to be replaced that year by a four-cylinder vertical motor.

In 1903 the Gas Traction Company of Minneapolis produced one-cylinder tractors, and soon replaced them with two-cylinder, and then, with four cylinder engines. Fred Glover left farming to direct the Gas Traction Company's manufacture of "The Big Four" Tractor, and a subsequent absorption of the company by Emerson-Brantingham Company of Rockford, Illinois, of which he became the vice-president. During the spring months of 1918, this latter company enjoyed sales of 10.4 million dollars (C.R. West, "Minneapolis As A Center of Tractor Manufacture and Distribution," Chilton Tractor Journal, I [July 1, 1918], 33-34, Minnesota Historical Society, Minnesota Tractors' Research, Files Box 4, 25.C.10.)

32. "In 1910, 72 million out of 325 million acres of harvested crop land were used to provide feed for farm horses and mules and another 16 million acres were used to provide feed for non-farm horses; so over one fourth of the crop acres were used for horse feed. In 1953, only 14 million acres of harvested crop land out of 349 million acres, or 4 percent of the total were used for this purpose." (William L. Cavert, "The Technological Revolution in Agriculture, 1910-1955," Agricultural History, XXX [January 1956], pp. 19-20).

The number of American farm animals was at its greatest number at the end of the Great War (Historical Statistics of the United States Colonial Times to 1957 [Washington: Government Printing Office, 1961], 100-01.)

| | <u>HORSES</u> | <u>MULES</u> |
|------|---------------|--------------|
| 1915 | 21,431,000 | 5,062,000 |
| 1916 | 21,334,000 | 5,200,000 |
| 1917 | 21,306,000 | 5,353,000 |
| 1918 | 21,238,000 | 5,485,000 |
| 1919 | 20,972,000 | 5,569,000 |
| 1920 | 19,767,000 | 5,432,000 |
| 1921 | 19,369,000 | 5,768,000 |

33. Henry Ford perceived the wartime need for agricultural products as an opportunity to promote a new light-weight, inexpensive farm tractor. His new product, the Fordson, was distributed to American and Canadian farmers in the last year of the war through the agencies

of their respective governments. In addition to North American sales, Ford built a tractor factory in England to help increase agricultural production there.

The Fordson was less than 2,500 pounds with a 20 horsepower, four cylinder engine on a 63 inch wheel base. Burning either kerosene or gasoline, the tractor travelled from 2 3/4 to 6 3/4 miles per hour in three speeds. Too small for large farms and too slow for easy crop cultivation, the Fordson suffered from mechanical failures and was prone to flip over. "No better or no worse than its contemporaries," comments Reynold Wik.

The production line of the Fordson was greatly speeded up and production rose from 350 tractors daily in 1921 to 750 tractors daily three years later. It took just 30 and 2/3 hours to turn the raw materials into 4,000 parts and these parts into a tractor. Peak production was reached in 1925 with 486,822 units being turned out, and in 1926 with 650,000 units completed (Reynold Wik, "Henry Ford's Tractors," Agricultural History, XXXVII, pp. 83-84 and Charles L. Cawood, "The History and Development of Farm Tractors, Part I," Industrial Archaeology: The Journal of the History of Industry and Technology, 7 [August 1970], 290.

34. Historical Statistics of the United States, p. 285; Hiram M. Drache, Beyond the Furrow (Dansville, Illinois: Interstate Printers and Publishers, 1976), p. 504.

"The Farmers of the United States had been purchasing about 4,000 tractors per year from 1910 to 1913. The number increased to 41,000 in 1917 and to 140,000 in 1920, the record high until 1936," according to Arthur G. Peterson, "Policy Relating to Farm Machinery in World War I," Agricultural History, XVII (January 1943), p. 37.

Canadian prairie farmers had purchased 38,485 tractors by 1921 and 50,136 by 1926 (Fowke, p. 81).

35. West, pp. 33-36; Horace B. Hudson, comp., Hudson's Dictionary of Minneapolis and Vicinity (Minneapolis: Horace B. Hudson, 1893-1926).
36. The tractor revolution was a proven reality by 1920 writes Hiram M. Drache. The inexpensive row tractor was then available to small farms, displacing labor and horses, and turning small farms into farms three times the size (Beyond the Furrow, p. 407).
37. Tractor firms often discovered themselves financially overextended, particularly in the years 1912 and 1921. The lure of quick profits enticed firms to enter into the new tractor technology without sufficiently considering the investment needed to develop and to produce such machines (Reynold Wik, "Henry Ford's Tractors,"

81; Cawood, 291, and "The History and Development of Farm Tractors: Part II, 1918-51," Industrial Archaeology, VII (November 1970), 410-411).

38. Reynold M. Wik comments that "the introduction of the Farmall in 1924 with its ability to farm row crops made the Fordson more obsolete" ("Henry Ford's Tractors," 80).

Bert Benjamin designed the Farmall as "a high-clearance tricycle tractor of unit construction permitting the direct attachment of implements behind, below and in front of, the unit." From a tillage machine, the tractor became a machine "of universal, year round usage" (Cawood, "The History and Development of Tractors: Part II," 411).

39. Norman F. Thomas compiled deficits in thousands of dollars of American implement companies for the following years (p. 168):

| | <u>IHC</u> | <u>DEERE</u> | <u>CASE PLOW</u> | <u>CASE THRESH</u> | <u>ADV. RUMELY</u> | <u>AVERY</u> |
|------|------------|--------------|------------------|--------------------|--------------------|--------------|
| 1921 | -5175 | -5202 | -2985 | -3739 | -2525 | -1518 |
| 1922 | -3522 | -3833 | -1340 | - 588 | - 236 | - 990 |
| 1923 | 1064 | 739 | -1253 | - 275 | - 631 | -1314 |

40. Bellan, pp. 95-96.

41. E.P. Neufeld, p. 18; Phillips, pp. 55 and 61. Phillips relates the activity of Massey-Harris Company against the proposed Canadian-United States reciprocity in 1910-1911. The company reacted to the widespread Canadian fear that reciprocity would end Canadian manufacturing. Following the election of a Democratic Congress on November 7, 1910, the passage of reciprocity in the United States Congress seemed assured. Massey-Harris, therefore seven days later proceeded to purchase Johnston Harvester Company of Batavia, New York, to protect its manufacturing future.

A different Canadian reaction was that of the United Grain Growers of Winnipeg when the hope of reciprocity was ended with the fall of the Liberal Government. United Grain Growers to provide low-cost implements for Canadian farmers opened fifty-seven agencies throughout the prairies from 1912 to 1922. The Cooperative, however, was never able to gain access to a regular supply of implements from Canadian or American companies (pp. 59-60).

42. Bellan, p. 135.
43. Phillips, p. 55; Neufeld, p. 16.
44. Massey-Harris bought the J.I. Case Plow Company plant at Racine, Wisconsin, for 1.3 million dollars in cash and 1.1 million dollars in Bonds. The exclusive use of the J.I. Case name was sold to the J.I. Case Threshing Machine Company of Racine for \$700,000 (Neufeld, p. 24; Phillips, pp. 65 and 173).
45. Wartime pressures caused the Canadian price of wheat per bushel to rise to the high of \$2.22 in 1918, \$2.39 in 1919, and \$2.51 in 1920. By 1921 the price dropped back to \$1.65, and in 1921 to \$1.23 (Fowke, p. 200).

The United States wheat prices did not rise as high and peaked earlier: \$2.05 in 1918, \$2.16 in 1919, with the price descending in 1920 to \$1.83 and 1921 to \$1.03. (Historical Statistics of the United States, p. 137.)

46. Three attempts were made to field a Canadian prairie tractor. Canadians in 1909 gained the right to form The Gas Traction Company Limited of Winnipeg. In 1911 The Gas Traction Company of Minneapolis bought out the Winnipeg company to end this first Canadian effort (Northwest Farm Equipment 25 [May 31, 1911], 14). The following year Emerson-Brantingham absorbed The Gas Traction Company of Minneapolis and centered its operations in Rockford, Illinois.

In Medicine Hat, Alberta, forty Canadian Tractors were manufactured after the Great War. The company promised a well-tested tractor for \$1,200 with "fewer parts than a binder". The wooden frame and parts shrunk in the dry prairie weather, and the tractor also had mechanical problems (Grant MacEwan, Power for Prairie Plows [Saskatoon: Western Producer Book Service, 1974], p. 90).

A third effort saw a tractor factory with capital stock of \$1 million to produce The Canadian Bull Tractor of Winnipeg. Its duration was short, however, as the Minneapolis Company which supplied technology went bankrupt later that year.

47. Bellan, pp. 145-53.
48. Bellan, pp. 154-55.