

THE RISE AND FALL OF THE CATTLE TRAIN IN CANADA

BY
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17

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**A Thesis submitted to the Faculty of Graduate Studies of the University of Manitoba
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ABSTRACT

This thesis examines the history of long-haul cattle transportation in Canada with specific reference to the effect of inter-modal competition on the location of the cattle processing industry. The study explores this history in chronological order, closely examining:

- competition in the transport industry
- location of the cattle supply
- location of cattle slaughtering
- location of markets for beef

As competition in the transport industry increased, the location of processing shifted from a position close to the final markets for beef, towards the location of supply - the western prairies. Increasing competition allowed firms to slaughter cattle at the source of supply, and ship only beef, reducing transport costs. Although transport factors played a large role in the shift of the processing centre, other factors such as changing patterns of trade, shifts in the Canadian population, and the increased competitiveness of Albertan feedlots have been identified as important.

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CHAPTER ONE : INTRODUCTION

This introductory chapter contains four separate parts. The first part is a general introduction to the thesis. Section 1.2 lays out the objectives of the study, while section 1.3 provides a brief overview. Finally, section 1.4 provides some information on the definitions and conventions used throughout this document.

1.1 Introduction

Today, no cattle are moved by rail in Canada. This is starkly different from the situation that existed 100 years ago, when significant numbers of cattle were shipped over long distances by rail. In the past, the cattle were shipped by rail from the principal source of supply, the western prairies, to the principal source of demand, eastern Canada. Over the years, millions of cattle made the arduous journey from southern Alberta to Toronto and Montreal by train. However, at some point in the middle of the 20th century, the number of cattle shipped by rail began to decline. By

the mid-1980s, the number of cattle shipped from west to east by rail was essentially zero.

Historically, the principal demand for meat products in Canada has been in the most populated parts of Ontario and Quebec. Western Canada has always had a small share of the population, and therefore a small share of the demand. However, the abundance of ranging land has given the west a comparative advantage in the production of cattle. In the early days, cattle were transported from west to east, and processed at the centres of high demand for meat products. As the transportation industry developed, the producers were able to supply the eastern markets more efficiently by raising, slaughtering and packing cattle in the west, then shipping only the meat to the east.

Changes in the transportation industry have had a tremendous impact on the way that cattle are shipped, and on the structure of the cattle and beef industries. At one time, the railways had a complete monopoly over east-west (and west-east) transportation. The railways used this monopoly to restrict the use of refrigerated rail cars, forcing the processing of cattle to take place in the east. The railways tried to restrict the use of refrigerated cars because of their substantial investment in the live animal trade. This attempt parallels the actions of the U.S. railways several decades earlier, where the railways did not allow meatpackers in Chicago to use refrigerated cars to ship beef to the eastern U.S. market (Aduddell and Cain, 1973).

Under the rail hegemony, freight rates discouraged the processing of cattle in beef in the west. However, starting in the 1930s, the introduction of motor truck competition eroded the rail mode's position of dominance. This new competition in the transport industry allowed entrepreneurs in the cattle and beef industries to benefit from the use of refrigerated transportation to ship beef, not cattle, to the east. Competition with trucks forced the railways to react by lowering their rates and offering more flexible services. Soon, the locus of production of beef started to shift from eastern Canada towards the west.

The logistics of cattle transport have changed dramatically since cattle were first raised on the western prairies. The history of cattle transportation in Canada can be divided into three broad stages:

1. pre-rail transport → beginnings of rail transport
2. rail transport → beginnings of truck-rail competition
3. truck-rail competition → truck dominance

Dividing the period of study into these three stages simplifies the research. The thesis will follow this thematic division of the history of Canadian cattle transport, devoting one chapter to each part. To simplify matters further, these parts will be approximated by the following periods: part one, -1900; part two, 1900-50; and part three, 1950-present.

It is the thesis of this study that after western Canada was able to produce more cattle than it needed, high railway rates on meat and lower rates on cattle encouraged the shipment of cattle to the east for processing. The prairies were a surplus producer of cattle by the turn of the century. Later, competition from trucks forced competitive freight rates, and this led to increased beef production near the source of the raw materials, in the west. The competition from trucks began in the 1930s, and increased gradually until the 1950s, when it took off. The competitiveness of trucks was increased in part by the substantial backhaul opportunities that the industry enjoyed compared to the railways.

1.2 Objectives

This thesis has three objectives:

- i To describe the historical patterns of cattle transportation between western and eastern Canada, including numbers of cattle moved, points of origin and destination, and mode of transport.
- ii To describe the historical patterns of location of the cattle processing industry, with special attention paid to the location of the cattle supply, the location of cattle processing, and the markets for cattle and beef.

- iii To explain why changes in the cattle transport system have occurred, with reference to the transport industry, the cattle industry, and the beef industry.

1.3 Overview

The thesis contains six chapters. Chapter one is the introductory chapter. It serves as a brief preparation for the rest of the study, and it also addresses several miscellaneous matters, such as definitions and other conventions.

Chapter two is the theoretical framework. The purpose of this chapter is to examine the theory relating to industry location, the transport industry, and the cattle and beef industries. Once this theory has been reviewed, it will help to shape the thesis by indicating what information is important and worthy of closer attention. The goal of this chapter is to gain insights into what information matters, to make a formal hypothesis, and to consider what information is necessary to confirm or reject this hypothesis.

Chapters three through five examine the history of the transport, cattle and beef industries in detail. Chapter three discusses the early development of the cattle industry, and the development of the first trans-continental railway, the C.P.R.

Chapter four examines the development of these industries in the first half of the 20th century. Chapter five looks at the industry development after 1950.

Finally, chapter six provides a summary of chapters two through five, and derives some broad conclusions from the evidence. Also included in chapter six is a summary of some areas for further research.

Due to the historical nature of this study, the quality of available data improves steadily as time progresses. However, in many cases ideal data are not available or accessible, and so proxies have been used.

1.4 Definitions and Conventions

This section is here to provide some background knowledge about the terms used in this thesis. Some of the terms have very specific meanings, and it is imperative that the reader have some knowledge of the distinctions before proceeding. The definitions can be divided into three categories: terms related to the cattle industry, terms related to the transport industry, and terms related to location.

The terms related to the cattle industry are the most problematic. This thesis is primarily concerned with cattle, which is a broad term that includes steers, bulls,

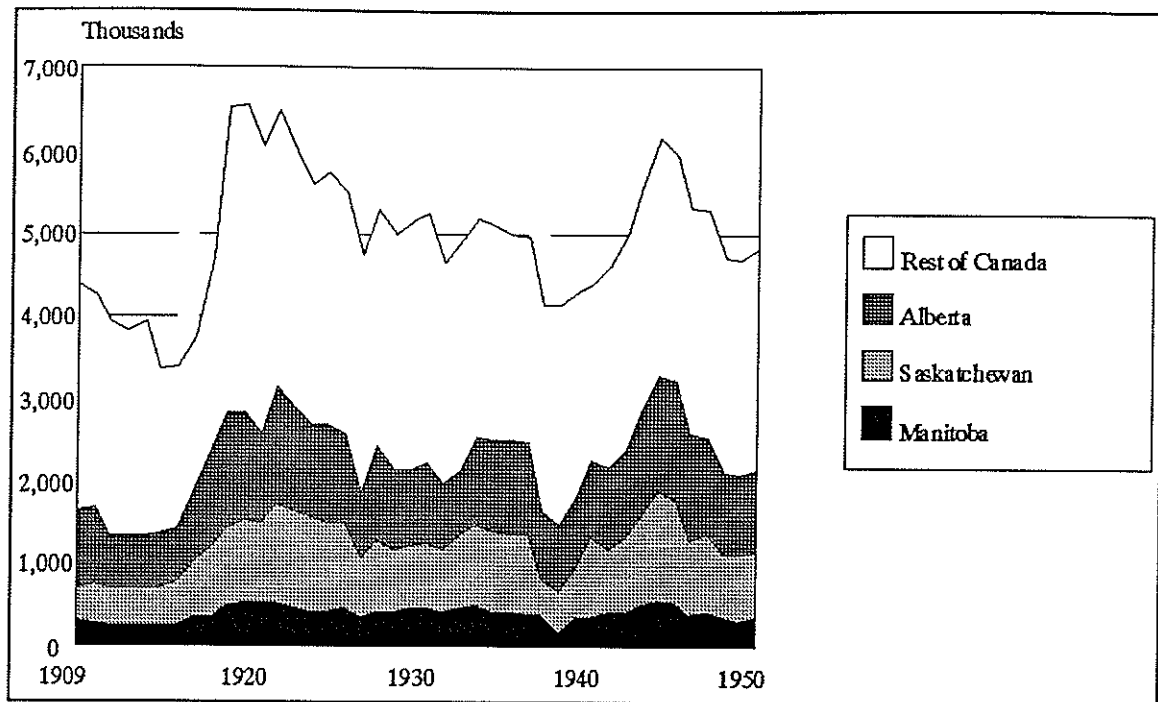
heifers, dairy cattle and several other varieties. Calves are young cattle. Some authors and sources make no distinction between cattle and calves. This study tries to maintain the distinction, although such efforts are not always successful or necessary. Cattle is a subset of livestock, which also includes hogs, poultry, sheep, lambs, and others.

Slaughtering is an activity performed on livestock to turn it into meat. After slaughtering is performed, cattle are dead and considered to be beef (or veal, in the case of calves). Slaughtering also produces offal, or by-products such as hides, hooves, bones, tongues, gallbladders, and other products. Cattle processing is synonymous with cattle slaughtering. Meat packing is the process of separating meat into smaller bundles, and does not strictly imply slaughtering, but is often used to mean slaughtering. A packing house is an establishment where packing takes place, and it usually (but not strictly) implies an establishment where slaughtering also takes place. A slaughterhouse is an establishment where slaughtering (and probably also packing) takes place. An abattoir is a slaughterhouse.

Considering the transport industry, the most important term is mode. The industry is composed of different modes of transport, the most important of which are the rail mode (railways), the highway mode (trucking and buses), marine (boats) and air (air carriers).

The locations considered in this thesis are western Canada, the prairies, and eastern Canada. Western Canada means the four western provinces, B.C., Alberta, Saskatchewan and Manitoba. Because of the low levels of cattle processing in B.C., the prairies are used synonymously with the west. Eastern Canada refers principally to Ontario and Quebec, but also includes the maritimes, by definition. In some cases, Ontario and Quebec are termed "central Canada", but these references are few. For the most part, everything east of the Manitoba-Ontario boarder is considered "eastern Canada".

The most important convention worth mentioning is the use of area graphs. An area graph is a useful way to represent several parallel series. The graph is different from a traditional "line graph" because the series are stacked upon each other. Most of the area graphs used in this thesis show the Manitoban, Saskatchewan, Albertan, and other Canadian shares of something. Consider figure 1.1, a typical area graph taken from another part of the thesis.



The Manitoban share is at the bottom of the graph, the Saskatchewan figures are stacked vertically on top of the Manitoban area, and the Albertan figures are put on top of the Saskatchewan area. The three areas, considered together, can be considered the total prairie numbers. When the data for the rest of Canada is stacked upon the prairie numbers, the total area is equivalent to the national total. These graphs are used because they clearly show the shares accruing to each province. Much of this study is concerned with relative shares of the cattle supply or of the slaughtering activity, and the area graph is a very useful tool indeed.

CHAPTER TWO: THEORETICAL FRAMEWORK

This chapter has three purposes: first, it will provide a theoretical framework that will be applied in the following chapters, second, it will state a hypothesis, and third, it will discuss what kind of evidence will be required to prove or disprove the hypothesis. The framework developed here relies on economic production theory, location theory, transportation economics and the economics of the beef and cattle industries.

Section 2.1 deals with location theory. This section discusses a model that combines production theory and location theory into a cohesive model. The materials developed in this part will prove to be useful tools later when the Canadian beef and cattle industries are analyzed. Section 2.2 examines transportation economics and theories of transport pricing.

The third part is a very brief discussion of some salient facts about the livestock and beef industries. This section is a summary of some important technical aspects of beef production, such as the weight-loss that occurs during production and damage

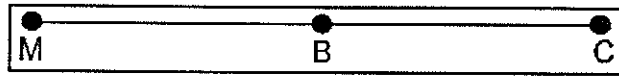
that affects cattle being transported. After looking at these three specific areas, the fourth section will summarize the main points and state a hypothesis. The final section will discuss the evidence that will be examined in an attempt to prove or disprove the hypothesis stated in section four.

2.1 Location Theory

Transportation has always been thought to be an important factor in determining where a firm chooses to locate. This is because the firm must often convert raw materials that are in one location into finished goods for consumption at a different place. In this case, transportation plays an important role in determining plant location because transportation costs are an unavoidable part of the production process. Of course, it is important to remember that there are other factors that affect location, such as labour, government and other factors.

The simplest example involves two points, the source of the raw material (M), and the locus of consumption (C). If M and C are at different points in space, then transportation inputs will be a necessary part of the production process. It is useful to imagine a system where there are only two points because Canada can be analyzed from a linear perspective; two points, east and west, connected by a single rail line. Figure 2.1 shows a spacial diagram of this idea.

Figure 2.1



Transport inputs are part of the production process. Transport inputs can most easily be expressed in terms of ton-miles; for example, one transport input could involve moving one ton of a commodity one mile¹. There are three possible production locations under these circumstances:

- (i) the raw materials are transported to point *C*, where they are processed and consumed. This involves the use of transport inputs on the raw materials, but no transport inputs are used on the final products.
- (ii) the raw materials are transported to some intermediate point (*B*) in-between point *M* and point *C*, where production takes place. After the raw materials have been transformed into final products, they are transported from point *B* to point *C*, where they are consumed. This involves the application of transport inputs to the raw materials, and to the final product.

¹Although some have criticized the use of ton-miles as a unit of measure for transport inputs, there does not appear to be any better practical alternatives.

- (iii) the raw materials are processed at point M , and the final products are then transported from point M to point C , where they are consumed. This involves the use of transport inputs on only the final product.

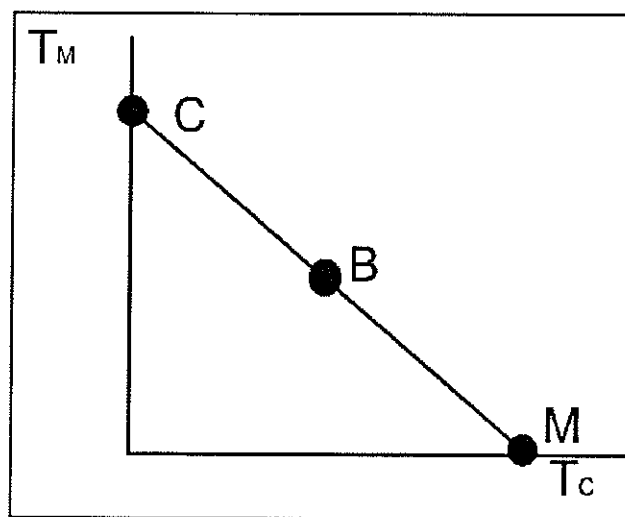
Each of these production locations involve the use of transport inputs. For simplicity, it is useful to assume that production is not a weight-losing (or weight-gaining) undertaking, and that labour is ubiquitous (freely available at all points). Under these circumstances, where will the firm decide to locate? To answer this question, a variant of production theory will be employed.

This problem is really about using transport inputs. The question is, should the firm apply transport inputs to the raw materials, or the final product, or both? The least cost relationship between these choices can be plotted on what is known as an iso-quant diagram.

Figure 2.2 shows the trade-off between using two different inputs - transportation inputs on the raw materials and transportation inputs on the final goods - to produce one unit of final product. The two axes in this diagram are labelled T_M and T_C . T_M is the transport inputs used on raw materials. When no transport inputs are applied to the raw materials, production takes place at their source, M . This is equivalent to item (iii), above. T_C is transport inputs applied to final products. If production takes place at point M , then the final goods must be transported to the location of

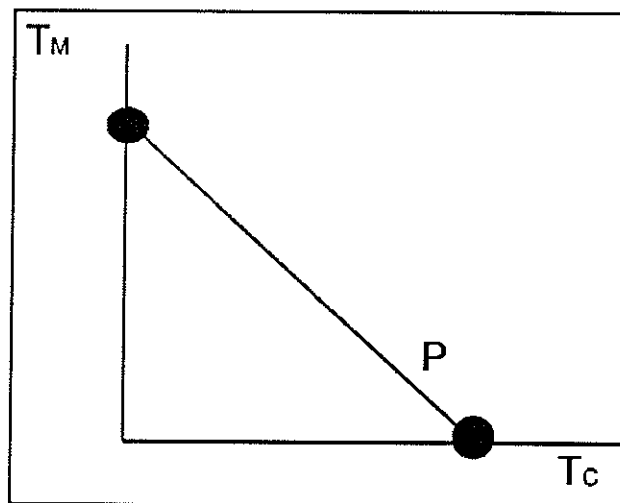
consumption. This is analogous to item (i), above. Point *B* represents a point equidistant from points *M* and *C*. As less of one input is used, more of the other input must be used to compensate. If less of one input is used without a compensating increase of the alternative input, production of one unit of final product simply cannot take place. There are other possible points of production; every point on the line *CM* is an alternative production site. Points above and to the right of the line *CM* are not least-cost alternatives and hence will not be considered. This diagram is exactly analogous to the iso-quant diagram of neo-classical production theory. The iso-quant *CM* is flat and has a slope of -1 because production does not change the weight of the raw materials - exactly one ton of raw materials are needed to produce one ton of finished products. If this assumption is changed, the slope of the iso-quant must also change.

Figure 2.2



To discover the optimal plant location, we must add prices to the brew. For now, we will assume that the price for transporting raw materials is exactly the same as the price for transporting finished products. This assumption insures that the slope of the iso-cost line is I when plotted on the same axes as figure 2.2. An iso-cost line, P , representing this relationship has a slope of $-I$, which is exactly the same slope as the iso-quant line.

Figure 2.3

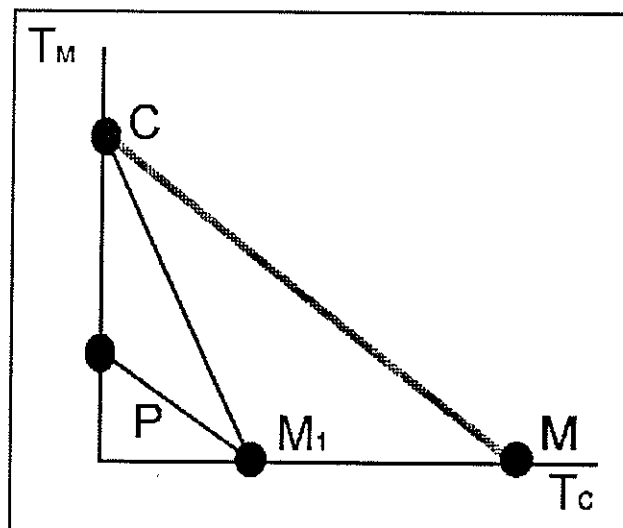


The optimal plant location is the point where the iso-quant line is tangent to the lowest iso-cost line, leading the minimum possible expenditure on transport inputs. If figure 2.2 is transposed onto figure 2.3, it becomes evident that the iso-quant and the iso-cost have the same slope, and are tangent at every combination of inputs on the line. In this case, however, every point of the line CM is a minimum cost location -

the solution is indeterminant; there is no single optimal location! This indeterminacy quickly evaporates when complications are introduced to the model.

The first complication is the introduction of weight-losing production. This is of particular interest for this thesis because, as will be seen in section 2.3.1, the production of beef is a weight-losing undertaking. In figure 2.4, the production of the final good is weight-losing; it takes more than one ton of raw materials to make exactly one ton of final goods. This causes the iso-quant line CM to rotate inward to the line CM_1 . This rotation occurs because it is now possible to use fewer transportation inputs to move the final product from point M to C , than to move the raw materials the same distance. The slope of an iso-quant where there is weight-losing production is no longer equal to one. In this case, the iso-quant steepens, indicating that fewer transport inputs are required to move the lighter final goods to C , compared to the transport inputs required to move the equivalent in raw materials to C .

Figure 2.4



When the steeper iso-quant of a weight-losing undertaking is combined with the original iso-cost line, the result is a minimizing of costs at point M_1 , as shown in figure 2.4. In this case, M_1 is the point where the lowest possible iso-cost line, P , touches the new iso-quant line, CM_1 . This is the lowest possible iso-cost line that fulfils the production requirements that the final goods end up at point C . In this case, the production operations are performed upon the raw materials before any transportation is undertaken. No transport inputs are applied to raw materials. After production has taken place, the new, lighter final products are transported to the consumption site with a lower cost in terms of transport inputs.

Figure 2.5

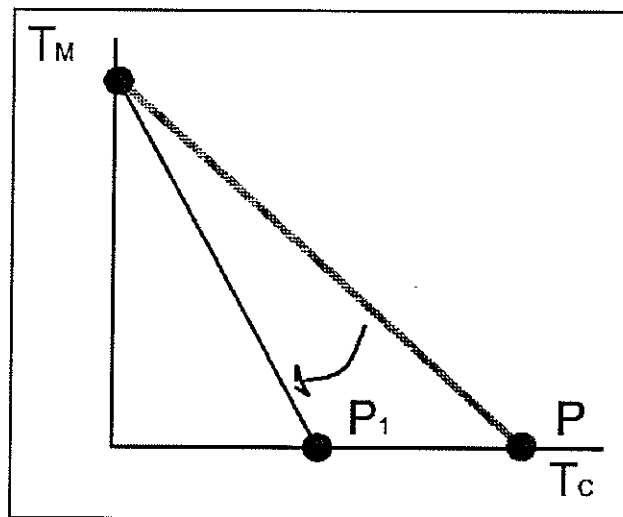


Figure 2.5 shows the effect of charging a higher freight rate for finished goods than for raw materials. Figure 2.5 shows the shift in the iso-cost line, P , for the creation

of a differential freight rate. This figure is plotted on the same axes as figures 2.2-2.4. Returning to the original assumption that there is no weight-loss in production, we next examine the result of a discrepancy in the freight rate charged on raw materials and finished goods. This is a useful exercise because the railways have often charged higher rates on finished commodities compared to raw materials. This statement will be supported by evidence presented in chapters three, four and five. If the freight rate on finished goods increases relative to the rate on raw materials, the iso-cost line will steepen, shifting from P to P_1 .

Figure 2.6

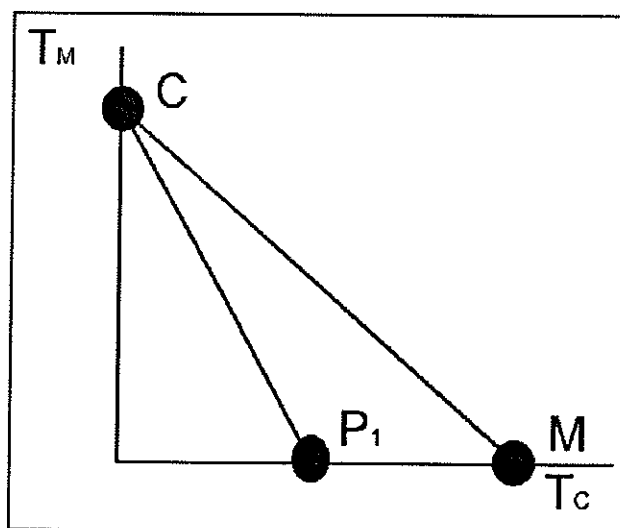


Figure 2.6 shows the effect of an increase in the relative price of transporting finished products compared to shipping raw materials. In this example, production is not weight-losing or weight-gaining. The rate differential is reflected in the steeper iso-cost line, P_1 . In this case, production will take place at point C , the place of

consumption, which is the lowest cost location given CM and P_f . In this case, transportation inputs are applied to the raw materials, (taking advantage of the lower freight rates on raw materials) and are processed at the point of consumption, C .

In summary, when production is a weight-losing undertaking, there are incentives to locate the plant at the source of the raw materials. If higher rates are charged on finished goods, then there are incentives to locate the plant at the place of final consumption. If there are price discrepancies and weight-loss in production, the optimal plant location depends on the relative strengths of the two forces, and is not immediately obvious.

2.2 Transportation Economics

The use of transportation inputs influences the location of plants and industries. The prices of transportation inputs, or freight rates, determine the amount of inputs that are used in the production process. This section focuses on value-of-service and cost-of service pricing methods, and backhaul demand. It is important to examine both monopolistic and competitive pricing because the Canadian transportation industry has been characterized by both of these industry structures over the past century.

2.2.1 Value-of-Service Pricing

Value-of-service pricing is based on the idea that the transport firm should charge "what the market will bear". Most often, this pricing scheme is associated with monopolistic pricing practices where the shipper pays a freight rate that is higher than the marginal cost of production. Value-of-service pricing entails price discrimination where shippers are segregated into different groups, and the groups are charged different rates that maximize the profit of the carrier.

Transport suppliers seek to segregate markets in order to enhance their net profitability by charging the maximum-profit rate in each submarket subject only to competitive pressures and legal constraints.

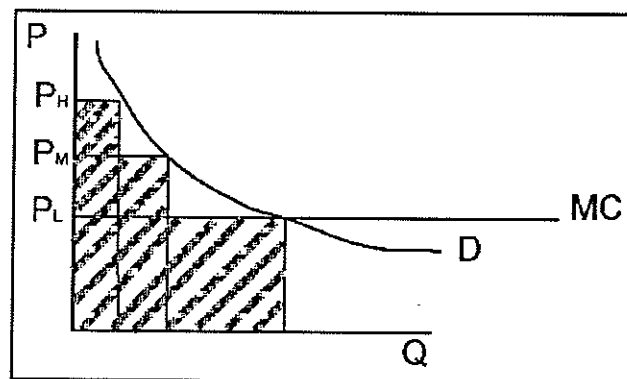
Conceptually at least, for any commodity, the precise meaning to be attached to the value of the service is very clear; namely, given the cost and demand characteristics for a particular commodity, *the* value of the service is the maximum-profit [freight] rate. (Wilson, 1980: 141)

Traditionally, railways have practised value-of-service pricing. In Canada, the C.P.R. had an early monopoly on all trans-Canada traffic, and the railroad was able to use market power to extract high freight rates from some groups of shippers, maximizing profits. In general, the higher-valued commodities were charged higher freight rates, and the lower-valued commodities were charged low rates to stimulate traffic. To maximize profits, the price discriminator attempts to charge the highest freight rates to the shippers that place the highest value on transport services and lower rates to shippers that place a lower value on these services. The amount that a shipper is willing to pay depends on the elasticity of demand for the product, and the

proportion of final price that is transport cost. A pure monopoly is not necessary to practice value-of-service pricing. In fact, some variant of the principal can be practiced in any industry where there is some degree of oligopoly. This means that although there were three trans-Canada railways operating during the first third of the twentieth century, they were still able to practice value-of-service pricing.

Figure 2.7 shows a price discriminator that has segmented its consumers into three separate sub-markets by the value that each group applies to the service. The highest rate, P_H , is charged to the shipper that places the highest value on transport, P_M and P_L are the prices charged to shippers that place low and lower values on transport services. The firm (in this case a railway) can increase profits by charging different rates to different customers.

Figure 2.7



There is an incentive for the carrier to charge different freight rates for different commodities. By adopting a price discriminating scheme, the railway has increased profits at the expense of the consumer surplus. It should be understood that value-of-service pricing simply means that the firm will charge the most that it can possibly charge, subject to demand and competition. This means, that if competition emerges, the old value-of-service prices are no longer optimal, and new value-of-service prices that take into account the new market will emerge.

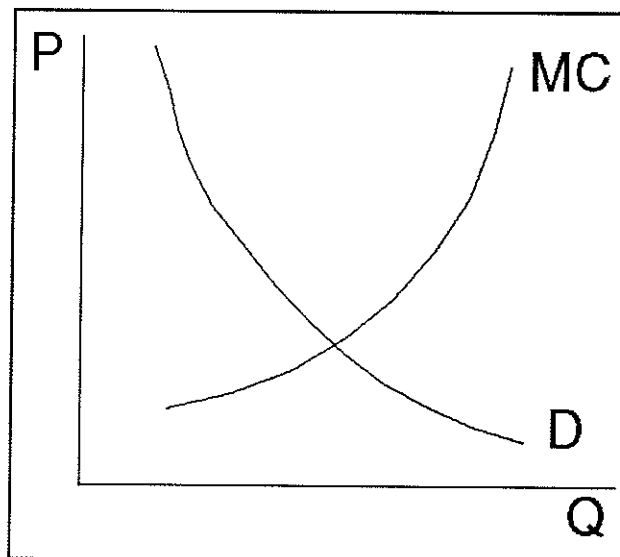
The principal drawback of price discrimination and monopolistic pricing is the effect on resource allocation. If freight rates are equal to the cost of providing the service, then society can achieve an optimal static allocation of resources. Section 2.1 pointed out the possible effect of freight rate differentials on the location of production. If a rate differential exists because of a difference in the cost of transporting two commodities, then the allocation of resources can still be optimized. However, if a differential exists because the carrier is employing price discrimination, the result is a sub-optimal allocation of resources. In this sense, value-of-service pricing can lead to a distorted allocation of resources.

2.2.2 Cost-of-Service Pricing

Cost-of-service pricing is when the freight rate is equal to, or based on, the cost of providing the service. This is the perfectly competitive equilibrium, where the marginal cost of production is equal to the price charged for the service. Figure 2.8 shows the competitive equilibrium in the same manner that figure 2.7 illustrated price discrimination.

Competition tends to drive rates down towards the perfectly competitive equilibrium. Often, competition is not perfect, and prices are driven down, but not all the way to the point where $P=MC$.

Figure 2.8



Cost-of-service pricing leads to an optimal allocation of resources. In Canada, competition was introduced into the transport industry with the development of the motor truck. Prior to the development of the motor truck the railways were the only practical mode of transport that could move goods between the east and the west. The development of trucks lead to a general decrease in freight rates because trucks were able to undercut the prevailing rail rates on some commodities. The emergence of truck competition moved the surface freight transport industry towards greater competition because trucking firms are generally small, and the barriers to entry into the market are negligible. It is important to keep in mind that the cost structure of the trucking industry is very different from that of the railways - the fixed costs in trucking are largely paid my the government in the form of highway construction and repair.

Intermodal competition is competition between more than one of the four modes of transport - rail, road, air and water. Competition between rail and road is of particular interest to this thesis because they are the only two modes that provide competitive cross-Canada transportation of freight. Water transport is irrelevant here, and the transportation of cattle and beef by air has always been limited to breeding stock and sample shipments of beef.

The important point to remember from this section on transportation economics is that when a firm has market power, they will maximize their profits by employing

price discrimination if the market is segmentable. One of the impacts of discriminatory pricing is a distorted allocation of resources from the static equilibrium. When new competition enters the market, the prices will fall as all firms attempt to maintain market share, and maximize profits (since not lowering prices would lead to less-than-maximum profits).

2.2.3 Backhaul Demand

Transport costs can be divided into fixed costs and variable costs. For railways, long-run fixed costs represent about 20 percent of total costs (Heads, et al, 1994). For trucking, the ratio of fixed to total costs is unclear. Very little research has been done on the cost structure of trucking, and the existing research is not very reliable. Nonetheless, some believe that the fixed costs in trucking are a lower proportion of total costs than in the railway industry.

When goods are transported from point A to point B, the carrier must move its equipment back to the original starting place. The return trip from point B to point A is called a *backhaul*. The first leg of the trip is called a *headhaul* or *fronthaul*.

In producing transport services, a backhaul is automatically produced as well; it is a joint product. It is impossible for the carrier to allocate all costs between the fronthaul and backhaul - the two legs of the trip are indivisible from a cost

standpoint. The only way to escape the cost of the backhaul is to not undertake the fronthaul.

On the pricing of backhauls, Button (1982) stated:

In a market situation joint costs pose few problems in practice. If there is a competitive road haulage service offering a round trip between A and B and back again each week using M trucks then equilibrium rates would soon emerge for each service (that is, from A to B and from B to A). Although there are specific delivery, terminal, pick-up costs, etc., little difference exists between the costs of running lorries fully loaded or empty and hence prices would be primarily influenced by the differences in the demand for each direction. In the short term the combined revenues from the A to B and the B to A services may not be sufficient to cover joint costs, but in such a situation the number of trucks offered would soon fall below M, increasing the price of trips in both directions until joint costs are recovered. Excess revenue above joint costs would have the opposite effect. The key point is that differences exist in the demands for the out and return services and that different prices should be charged for each in equilibrium. (Button, 1982, 80)

Unbalanced two-way demand for transport can lead to lower prices for return trips than for fronthaul trips. Securing backhaul loads is important for all transport carriers. Some carriers, such as trucks, however, have a slight advantage due to their superior flexibility and adoption of new technologies. For example, while the railways could haul no return freight in their cattle cars, the trucking industry developed a collapsible cattle car that could double as a flatcar for the return trip.

2.3 Cattle and Beef Industries

This section will discuss some technical aspects of the cattle and beef industries, concentrating on the issues of weight-loss in production, and bruising and shrinkage in transport. There is also a brief section on economies of scale.

2.3.1 Weight-Loss in Production

It has been said that beef production is a weight-losing undertaking. This means that it takes more than one ton of cattle to make one ton of beef. This is because the edible meat is only one part of the animal. In addition to the meat, cattle are composed of bones, hides, hooves, hearts, blood, livers, gallbladders and many other elements. The meat, when separated from the cow, weighs only 54% of the live animal weight. (Button, 1993: 23)

There are markets for the non-meat parts of the animal. Much of the non-meat elements are used in the production of pharmaceuticals, leather goods, pet food, and glue. However, the production of most of these goods is also weight-losing in nature.

2.3.2 Shrinkage and Bruising

Transporting cattle for long distances results in the shrinkage, bruising, crippling and death of a portion of the animals that are shipped. Shrinkage "is the loss in liveweight that occurs in livestock during shipment or other marketing processes." (Williams and Stout, 1971: 649) To combat shrinkage, (and to comply with federal animal handling legislation) cattle are unloaded to be fed and watered at intermediate points on their voyages. Feeding and watering cattle en route helps reduce dehydration and weight-loss. Since heavier, more meaty cattle are more valuable, shrinkage reduces the value of the cattle shipped. Shipments of chilled and frozen meat are not affected by shrinkage, although these shipments require specialized refrigerated trucks or rail cars.

When cattle are shipped over long distances, they often emerge bruised after their voyage. After slaughter, bruised portions of the animal must be trimmed out, reducing the weight of the meat, and leaving an unsightly and devalued carcass. (Williams and Stout, 1971: 663) Bruising tends to be a greater problem for animals that do not have enough room to move around during the trip. Shippers of cattle must resist the temptation to squeeze the maximum amount of animals into a truck or railcar, because this will result in bruised goods at the destination. Chilled and frozen meat is not susceptible to bruising to the extent of live cattle.

Cattle also die and are crippled in transit. Overcrowding, high temperatures, weather conditions and handling methods lead to the death of some cattle that are transported long distances.

In summary, the meat portion of a cow weighs only 54% of the liveweight. Due to this fact, to produce one ton of meat at the source of final consumption, it takes approximately twice as many trucks or railcars if live animals are shipped. In addition, the shippers of live cattle must contend with the problems of shrinkage, bruising, crippling and death, all of which devalue their livestock. Shippers of meat are not troubled by these problems to the extent of the shippers of cattle, but meat requires specialized refrigerated containers to maintain product quality.

2.3.2 Economies of Scale in Cattle Processing

In beef production, as in the production of many other goods, there are decreases in cost as the output of a firm increases. Were this not the case, all production would take place on the farm. Large processing plants allow for the specialization of labour and other economies.

The extent of scale economies is an important issue because it affects the industrial development of an industry. An industry that is characterized by a large number of

small plants can be evenly spread out over a large area, while an industry that is characterized by only a few very large plants is lumpy. In industries where there are economies of scale there will be fewer plants, and this can lead to an uneven geographical distribution of production.

2.4 Integrated Theoretical Framework

Based on sections 2.1-2.3, an integrated theoretical framework can be assembled to produce a hypothesis about the historical patterns of cattle transportation in Canada. The following points arise from the discussion above:

1. Beef production is a weight-losing undertaking.
2. In a locational model with one source of raw materials, one place of final consumption, and where the production process is weight-losing, the optimal plant location is at the source of the raw materials. This assumes that transportation rates for raw materials and final products are equal. However, if the freight rate charged on final goods exceeds the rate charged on raw materials, the location of production will tend to shift towards the location of final consumption. This linear configuration roughly parallels the Canadian

case where the western prairies have been a surplus producer of cattle, and the eastern provinces had excess demand for beef.

3. A transport firm with market power will use value-of-service pricing to maximize profits. This strategy often employs price discrimination where higher freight rates are charged to higher-value commodities. Value-of-service prices are higher than cost-of-service prices. The availability of backhauls and the inter-regional flow of goods also has an impact on freight rates.
4. Competition in the transport industry will tend to push freight rates towards the marginal cost of providing the transport services.

It is the thesis of this study that after western Canada was able to produce more cattle than it needed, high railway rates on meat and lower rates on cattle encouraged the shipment of cattle to the east for processing. The prairies were a surplus producer of cattle by the turn of the century. Later, competition from trucks forced competitive freight rates, and this led to increased beef production near the source of the raw materials, in the west. The competition from trucks began in the 1930s, and increased gradually until the 1950s, when it took off. The competitiveness of trucks in the long-haul cattle transport industry was strong because trucks had backhaul opportunities while no such opportunities existed for the railways.

2.5 Evidence Required to Support (or reject) the Hypothesis

In order to examine how competition in the transport industry has affected the location of the cattle processing industry, several different kinds of data are examined. To test the hypothesis, that the shift of processing from eastern Canada to the west coincided with the emergence of competition in the transport industry and the decline in transport costs of beef in relation to cattle, data regarding 1) the location of cattle slaughter, 2) the location of the supply of cattle, 3) the location of high unmet demands for beef, 4) the rates charged to ship both cattle and meat, and 5) the amounts of cattle and meat shipped from west to east, 6) competition in the transport industry, all must be examined.

The evidence examined in this study will naturally be historical in content. This does not mean that quantitative measures will not be used, but the scope of the study calls for flexible research methods which include the use of purely historical accounts.

The evidence about the location of the slaughter of cattle will be gleaned primarily from government statistical sources. Provincial distributions of cattle slaughter will be presented to show how the location of these activities changed over time.

Information about the location and size of meat packing plants will also be included.

However this information is sparse and not consistently available in the detail of the

cattle slaughter series. A history of the development of the beef slaughtering and packing industries in Canada is an important by-product of this work.

Evidence regarding the supply of cattle is also available primarily from government statistical sources. The location of large excess supplies of cattle is important to the hypothesis.

Evidence regarding the source of demand for meat product will be examined, although the statistical stocks of this information are slim. This evidence will be based on demographics and per capita consumption of beef, when this information is available. When numerical data is unavailable, historical studies will be consulted. Records of export shipments and other cattle movements are also very helpful in identifying areas with cattle deficits.

When examining the rates charged to the shippers of livestock and meat, a good deal of detective work is involved. Unfortunately, this information has rarely been published, and some simplifying assumptions will need to be made. Directly related to the rate structure is the extent of competition in the transport industry, which is a subject that will also be addressed. Between these two topics, an adequate picture of the transport industry, and its rate structure will be pieced together.

Finally, the numbers of cattle, and the amounts of meat shipped from west to east must be examined. In the more recent years, data on this subject is readily available from Statistics Canada. However, a description of the early activities in this area is more difficult to uncover. Due to the lack of solid statistical information, other less quantitative accounts will be examined to complete the history.

CHAPTER THREE: EARLY DEVELOPMENT OF THE WESTERN CATTLE AND TRANSPORT INDUSTRIES

This chapter addresses the early development of the western Canadian transport, cattle and meat packing industries. Since "early" is an ambiguous term, it will be defined as the last twenty-five years of the 19th century. There are very little statistical data available for this period, so the analysis and description relies mostly on second-hand accounts.

This chapter is organized thematically, and not chronologically. The first section discusses the development of the rail transport network in western Canada. The second section explores the development of the cattle ranching industry, with special emphasis on the large-scale part of the business. The third section examines cattle transportation in Canada to the end of the 19th century. Section 3.4 summarizes the chapter.

3.1 Early Development of the Rail Network

The transport network that we are interested in is one that can economically ship cattle from the west to the east. Cattle driving is not an efficient (or economic) way to ship large amounts of cattle from the western prairies to eastern Canada. The first mode of transport that offered prospects for shipping large numbers of cattle over vast distances was the railway.

In 1870, the Dominion of Canada promised to build a transcontinental railway to British Columbia as part of a deal that brought that territory into confederation. Railways had been operating in eastern Canada for several decades, but they were non-existent in western Canada. Prior to the building of the trans-continental line, there was an extensive rail network in eastern Canada. Transportation between the west and the east was predominantly by water over the great lakes. At this time, Manitoba had strong connections with Duluth and St. Paul, and there were regular caravans of wagons that made the trek between the Manitoba and Minnesota. It was also possible to travel from Manitoba to eastern Canada via the United States by wagon to Minneapolis, and on from there by rail.

The new line to the west coast was constructed by the Canadian Pacific Railway Company, and by 1880, many parts of the line were either constructed or under contract to be built. By 1885, the company was operating rail service between the west coast and

Montreal. According to transport historian G. Glazebrook, "The building of railways from Lake Superior to the Pacific coast revolutionized conditions in that area (the west) and led to its exploitation from the eastern centres" (Glazebrook, 1938). The availability of rapid trans-continental transport had a huge impact on the development of the cattle ranching industry, as will be discussed in section 3.2.

At the time of building, the C.P.R. had been guaranteed a monopoly under the following terms:

For 20 years from the date hereof, no line of railway shall be authorized by the Dominion Parliament to be constructed south of the Canadian Pacific Railway, from any point at or near the Canadian Pacific Railway except such line as shall run South-West, or to the Westward of South-West; nor to within fifteen miles of latitude 49. And in the establishment of any new Province in the North-West Territories, provision shall be made for continuing such prohibition after such establishment until the expiration of the said period. (Glazebrook, 1938)

This monopoly was an inflammatory issue in the west, where complaints about excessive freight rates were already being heard in the early 1880's. Westerners claimed that they

should not be expected to pay freight rates that were inflated over the rates in eastern Canada, especially since the C.P.R. had been subsidized by the government.

Year	Grand Trunk Railway		Canadian Pacific Railway	
	real earnings per ton mile		real earnings per ton mile	
	cents	index (1900=100)	cents	index (1900=100)
1886	0.73	116	1.13	143
1887	0.69	110	0.99	125
1888	0.69	110	0.96	122
1889	0.70	111	0.88	111
1890	0.68	108	0.81	103
1891	0.67	106	0.87	110
1892	0.68	108	0.87	110
1893	0.65	103	0.88	111
1894	0.70	111	0.95	120
1895	0.73	116	0.91	115
1896	0.76	121	0.90	114
1897	0.75	119	0.91	115
1898	-	-	0.83	105
1899	0.66	105	0.81	103
1900	0.63	100	0.79	100

Source: Cruikshank, K. "The Transportation Revolution and its Consequences: the railway freight rate controversy of the late 19th century", *CHA Historical Papers* (1987)

By 1890, the C.P.R. and the G.T.R. controlled over 80 percent of the rail trackage in Canada. The two railways were fierce competitors in eastern Canada, but the C.P.R. had a monopoly in the west. Figure 3.1 compares the earnings per ton mile of the C.P.R.

(transcontinental railway) and the G.T.R. The measure of earnings per ton mile is used because it is expected to approximate the level of rates per ton mile.

Table 3.1 shows that the earnings per ton mile of the C.P.R. were higher than that of the G.T.R. This is because the G.T.R. faced stronger railway competition in eastern Canada. The data also indicate that rail rates followed a downward trend over the period, 1886-1900. The indexes show that the C.P.R. rates declined more rapidly than the G.T.R. rates over this time period.

Starting in 1884, Canadian railways began to set rates by using the "class rate" system. This system developed out of the problems that the railways experienced in setting rates because of the many possible origins and destinations of freight, and the many different commodities carried by rail. It was clearly impossible to set a rate for each of 25,000 commodities between every possible set of origins and destinations, so a scheme was developed to reduce the number of calculations required to set rates. By this system, commodities were assigned to a "class", numbered 1 through 10. Higher-valued commodities such as manufactured products and perishable foods were assigned to the higher classes (classes 1-5), while lower valued goods such as coal, grain, lumber and livestock were assigned to lower classes (classes 6-10) (Fast, 1969). From this point, a single full tariff rate was set for the different combinations of origins and destinations. Class 1 goods paid the full tariff, while class 2 goods received a slight discount, with each lower class of good receiving a greater discount off the full tariff. Although the classes

were numbered according to value, the percentage relationships have not been constant over the long run. This rate-making strategy makes perfect sense considering the nature of the railway's costs, as discussed in section 2.2. It is important to note that the railway's rate per ton mile was not constant over all stretches of track: a class 1 carload movement of 100 miles in western Canada was still more expensive than a similar movement in the east.

Dissatisfaction stemming from freight-rate discrepancies was on the rise in the west. The idea that the railway rate structure "deprived certain communities of their natural geographic advantages lay behind many of the rate grievances of the late nineteenth century" (Cruikshank, 1987). The government made attempts to resolve the differences between the railway and the western provinces by appointing several Royal Commissions to examine the problems. Sir John A. Macdonald appointed one such commission in 1886 to examine the regional difficulties.

In keeping with the 'monopoly clause', no railways were permitted to be built south of the C.P.R. lines. Many attempts were made in Manitoba to obtain a railway charter so that the C.P.R. could be circumvented via Duluth, through Chicago to Sarnia, ON. Each application for a railway charter met with refusal from the government. By 1888, public pressure had reached a sufficiently high level that the 'monopoly clause' was revoked, and the C.P.R. was compensated with cash payment of \$15,000,000. Near the turn of the century, the Canadian Northern Railway built lines in Manitoba, but chose to split the

traffic with the C.P.R., rather than engage in a price war. The Canadian Northern Railway was later to become a part of the government-run Canadian National Railway.

In 1895, another Royal Commission was appointed to examine the higher rates in the west. This commission decided that the western rates were not exorbitant, and that the C.P.R. rates were actually lower than some U.S. railways in similar situations. As the century drew to a close, several high-profile rates grievances were examined in the west.

In the east freight rate complaints of merchants and manufacturers often represented a defense of established patterns of trade. In the west, businessmen castigated railway officials for failing to adjust the rate structure in response to the rapid development of new centres of economic activity. In both regions throughout the late nineteenth century a growing number of Canadian businessmen shared the experience of economic dislocation, increasing competition, and industrial concentration generated by the revolution in transportation technology. They gradually challenged the ultimate authority of the railways, through their rate-making practices, to determine the pattern of economic development in Canada. This broad and diverse coalition of dissatisfied shippers eventually came to share a common goal - the creation of a railway commission. (Cruikshank, 1987)

These pressures led to the creation of the Board of Railway Commissioners in 1904 to regulate the activities of the railways. However, as will be seen the creation of the Board of Railway Commissioners was not the end of the western freight-rate grievances - it was only the beginning of an issue that would fester for close to a century.

In summary, the period before the turn of the century saw the development of the C.P.R., Canada's first transcontinental railway. The rates charged by the C.P.R. reflected its

monopoly position which had been guaranteed by the government. Railways in Canada charged rates based on the "class rate" system, where higher-valued goods were charged higher freight rates. The relatively higher rates charged in western Canada and the preferential treatment of some shippers led to the development of a deep dissatisfaction and distrust for the railway in the west.

3.2 Early Development of the Cattle Industry

This section discusses the development of the cattle industry in western Canada. A brief note on the scale of the meat industry before the turn of the century is also included. The narrative is chronological in order, placing as much emphasis as possible on the numbers. However, published statistics from this era are relatively sparse, so the discussion is not as quantitative as desired.

Prior to the introduction of domestic cattle to the western prairies, the plains were populated by bison that grazed on free grass. The similarities between the bison and cattle, and the fact that the bison had flourished on the prairies for many years foreshadowed the development of the domestic cattle industry. The first cattle on the western prairies came from the U.S., where a more mature ranching industry existed. The U.S. ranching industry grew quickly in the western states after the American civil war. It was noted in the U.S. that as the railway network extended into the western states, the

level of cattle raising increased and the plains began to be fully utilized. (Breen, 1983)
Canada experienced a similar situation, where the cattle raising industry began to grow much more rapidly once the C.P.R. was expected to stretch into the prairies.

By 1875, U.S. ranchers had begun to move small herds of cattle into the south-western Canadian prairies, in search of good grazing land and opportunities to increase the size of their operations. Although this was the beginning of the Canadian industry, it would be incorrect to view the Canadian industry as a northern extension of the U.S. industry because the west was also stocked with cattle coming from eastern Canada. (Breen, 1983)
The south-western prairies were an ideal location for cattle raising because of several natural advantages that existed there. The area, in what has become southern Alberta, was blessed by warm winter winds descending from the Rockies, which made grazing possible even during parts of the winter. In addition, the lands were not tremendously productive for grain farming, and so the opportunity cost of using the land for cattle grazing was low. During this period, cattle raising consisted simply of acquiring a calf and letting it fatten up by feeding on free grass for several years. This was called the "free-grass" era of ranching in Canada, because there was an abundance of land with few alternative uses.

Around the same time, the Government of Canada sent a group of police officers, the North West Mounted Police into the west to promote stability and security. The NWMPolice were dispatched principally to deal with poachers and whiskey traders who were very powerful in the west. This added protection benefitted the ranching industry

and allowed it to develop naturally. Ranching was developing at a reasonable pace in the areas of Fort MacLeod and Calgary, the Bow River valley, and around Winnipeg. Also increasing the security of the region was the signing of various the Indian treaties which led to fewer disputes with the Indians (Breen, 1983).

By 1880, the cattle industry was firmly established in the prairies, with approximately 200 small ranching operators. During the early 1880's, larger investors began to closely examine the western cattle industry. By 1878, plans for the building of the C.P.R. had reached a fevered pitch, and it was clear that there would soon be reliable transportation links between the west and the east. Compounding this growth was the realization that there was a large market for live cattle in Great Britain. In the early 1880's, Great Britain placed an embargo on all U.S. cattle entering the country, but placed no similar constraint on Canadian cattle. The U.S. had been exporting large numbers of cattle into Britain, and the embargo created a tremendous opportunity for the fledgling western cattle industry. This led to a surge of investment in cattle raising in the west, as easterners and expatriate Britons began to undertake cattle raising in the west on a much larger scale than had been previously attempted. Exporting cattle to Great Britain was one of the major targets of the expanding western cattle industry.

The cattle industry was extremely profitable at this time. According to Breen, it was "generally acknowledged that the average profit for the stock-grower has been for years fully 33 per cent" for the 1880's (Breen, 1983). In addition to this,

The arithmetic of profit was blatantly straightforward; a good calf worth five dollars at birth could be fed on almost free grass and would bring forty-five to sixty dollars when ready for market three or four years later. (Breen, 1983)

During the years 1881-83, the western cattle industry experienced rapid expansion. No longer was this a frontier industry, it was beginning to look much more industrialized as large firms acquired land leases and began raising massive herds. The development of the cattle industry was paralleled by the development of the Cattlemen's Association, a group that was born to represent the cattle industry. This group successfully lobbied the government to drop all duties on the imports of live cattle from 1881-86, for the purposes of stocking the western prairies with cattle.

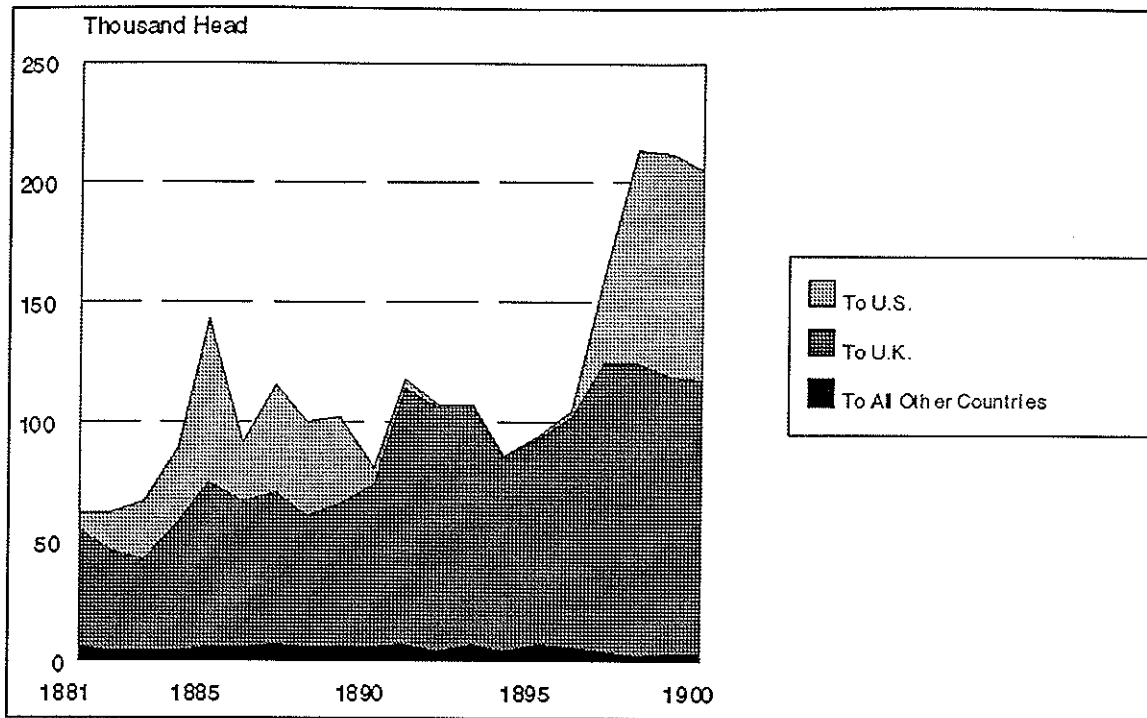
There were conflicts within the Cattlemen's Association, and most of the problems were disagreements between small-scale and large-scale organizations about how the association should be run, and what its agenda should be. This led to several splits in the organization. This tension was partly the result of increased concentration in the cattle industry. Since 1880, the industry had been moving towards larger, corporation-style ranches.

By 1884, two-thirds of all stocked land in the south-west was controlled by ten companies. The extent of company control is underlined by the fact that the four venerable giants of the Canadian range, the Cochrane Rancho Company Ltd, the Walrond Rancho Company Ltd, the Oxley Rancho Company Ltd, and the North-West Cattle Company Ltd, held almost half of such lands. (Breen, 1983)

In 1886, however, the group turned to protectionism and changed its stance to become strongly opposed to imports of live cattle. The move towards protectionism was initiated by the largest ranchers, who had over-run the smaller owners in the Cattlemen's Association power struggle. The strong political pressure applied by the group led to the changing of import tariffs and the end of live cattle imports to Canada - the association claimed that there was no need for imports because the west was brimming with cattle.

The numbers of cattle on the prairies grew rapidly during these years. In 1881, there were about 15,000 cattle on the prairies; in 1884, there were 43,700 cattle; and in 1889, there were 110,500 cattle. (Breen, 1983) During this period, the cattle industry became an important national industry. Most of the marketable western cattle were shipped live to Britain, where they were slaughtered and consumed. Figure 3.1 shows the numbers and values of Canadian cattle exported to Britain, the U.S., and the total cattle shipped to all countries.

Figure 3.1: Canadian Cattle Exports, 1881-1900



Source: Breen, David The Canadian Prairie West and the Ranching Frontier: 1874-1924, (Toronto: University of Toronto Press, 1983)

The information in figure 3.1 shows that the bulk of Canadian cattle exports were shipped to Great Britain. Cattle exports to the U.S. were fairly erratic.

While large numbers of cattle were being produced, the local population increased slowly. In particular, the population in western Canada was not expanding at a breakneck pace. This made for small local markets for beef. Although some butchers were importing cattle in the late 1870's to supply the local market, by the mid-1880's, the local markets were supplied entirely with Canadian cattle, especially after the ban on cattle imports.

Prior to the mid-1880's most of western Canada's beef cattle were used in the West, much of it for large projects such as railway construction gangs, some for Indian and North West Mounted Police supplies and the rest for local consumption. However, in 1887 it was reported that "last year it was evident... that an outside market would soon have to be found for the surplus cattle" (*The Commercial*, 19 April 1887) (Silver, 1994)

The packinghouses in Winnipeg developed only to serve the local market, using the cattle that were of too low quality to export. In fact, Gordon, Ironside and Fares, which was based in Winnipeg, operated a slaughterhouse to serve the local market, but did not engage in any cattle processing for other markets. (Silver, 1994) By 1906, the firm of Gordon, Ironside and Fares had become the largest cattle exporter in the world. According to Silver (1994), this was because other major beef suppliers had decided to specialize in the "dead meat" trade, a decision that was not mirrored by the Winnipeg firm, which apparently had no desire to expand further into processing. A discussion of some of the transport factors relating to the cattle export trade is reserved for the next section.

In summary, the cattle industry in western Canada experienced strong growth in the last quarter of the 19th century. The industry growth was sparked by government incentives, the development of the rail network, and opportunities to export live cattle to Great Britain. Starting with virtually no cattle, the industry used imports from the U.S. and western Canada to grow into a large export-oriented industry.

3.3 Early Development of the Cattle Transport Industry

This section specifically addresses cattle transport. Since the last two sections have dealt with the transport industry and the cattle industry separately, there will be some overlap. Cattle produced in the pre-railway period were commonly driven down into the U.S. to market. "With nine hired cowhands Harper drove nearly 2000 head of British Columbia cattle to San Francisco" (Thomas, 1976). However, this method of transport was extremely time-consuming and unduly hard on the cattle.

It was noted in section 3.2 that the coming of the railway had a tremendous impact on the growth of the western cattle industry because it enabled cattle to be shipped to Great Britain via east coast ports. The increases in production that occurred in the late 19th century were marketed overseas, since the local markets for meat had been sated.

Transporting cattle involved large infrastructure expenditures on the part of the railway. Special livestock cars were needed for the cattle, and stock yards had to be developed at several places along the line so that the cattle could be unloaded, fed and watered and rested. The railway's investment in cattle cars, siding facilities and stock yards made them unwilling to support the dressed beef trade in the west. The C.P.R. was very supportive of the western cattle export business, and they constructed stock yards at several points along their main line. In addition, when capacities were reached, the railway was eager to expand the existing facilities to accommodate the extra traffic. In 1890, it was reported in

Winnipeg that the C.P.R. was doubling the capacity of its yards to handle the increasing cattle trade with Great Britain (Silver, 1994).

While the C.P.R. was eager to help accommodate the needs of the cattle exporting industry, they did not cooperate with entrepreneurs attempting to boost Winnipeg's shipments of dressed meats. This was partly due to the large profits made by the railway on cattle shipments, and partly due to their significant infrastructural expenditures.

The C.P.R. was not prepared to invest in refrigerator cars to give Winnipeg-dressed meat access to eastern markets, nor were cattle-shipping firms like Gordon and Ironside ready to make such investment when established eastern packers already controlled the eastern Canadian markets. (Silver, 1994)

By the time the C.P.R. was finished in 1885, there were carloads of cattle being shipped to eastern markets. In 1893, it was reported that the firm of Gordon and Ironside was shipping large numbers of cattle east, and that the firm shipped 17,000 head in 1894. (Silver, 1994: 8) The same source indicates that 30,000 western Canadian cattle were shipped east in 1894. If all of these animals were exported to Great Britain, the western cattle would have amounted to 37% of Canadian cattle exports to that country.

Even before the beginnings of the massive shipments of cattle to the east, some westerners questioned the wisdom of shipping live animals instead of dressed meat. In 1886, an editorial in *The Commercial* claimed that the west needed to decide how their surplus cattle should be shipped: dead or alive. It was the concern of the newspaper that

Winnipeg was losing out on value-added creation and job prospects by not processing their cattle in the city and shipping only the meat (Silver, 1994). The C.P.R. was staunchly against any move towards the dressed meat trade. In 1886, the General Traffic Manager of the C.P.R. was quoted as saying that he was opposed to the development of the dressed meat trade in Winnipeg, in part because he believed that Winnipeg did not have the secondary industries necessary to absorb the offal (*The Commercial*, 19 October, 1886, and Bellan, R., 1978). In addition to this, the Manager, Mr. Olds, was quoted as telling the Winnipeg industry (regarding cattle processing), "Let others handle it for you; let Montreal men take it in hand" (*The Commercial*, 19 October, 1886). The C.P.R. was also not eager to adopt the refrigeration technology required for this trade.

The class rate system employed by the railways discriminated against the shipment of dressed meat. As noted in section 3.1, there were 10 classes of goods, where the high-classed goods (those commodities with low class numbers) were charged higher rates than the low-classed goods. The railway often put a favourable spin on this price discrimination, broadcasting in 1888 that they had issued a new "special tariff" for livestock to help the cattle trade (Silver, 1994). Fast (1969) notes that cattle were shipped under class 9, while meat was shipped under class 4. This pricing is consistent with the model of monopoly pricing discussed in section 2.2.

In summary, the railways acted as a catalyst for the growth of the cattle industry in the west. Their heavy involvement in cattle transport required large investments in

infrastructure, for cattle cars and stock yards. The C.P.R. appeared to be opposed to developing an export-oriented dressed meat business in Winnipeg and the west.

3.4 Summary and Conclusions

The discussion in this chapter yields the following points:

1. The period before the turn of the century saw the development of the C.P.R., Canada's first transcontinental railway. The C.P.R. used market power to inflate rates in western Canada, based on the "class rate" system.
2. The cattle industry in western Canada experienced strong growth in the last quarter of the 19th century. This growth was induced by government incentives, the building of the C.P.R., and market opportunities in Great Britain.
3. The railway carried western cattle to export positions at eastern Canadian ports. Due to its investment in *cattle* transport infrastructure and the profitability of cattle transport, the C.P.R. appeared to be opposed to developing an export-oriented dressed meat business in Winnipeg and the west.

4. The history of the cattle transport industry in the 19th century is consistent with the theoretical model developed in chapter two. The model predicted that a rail monopoly would lead to differential freight rates, which would tend to move the location of production towards the point of consumption. The business of cattle exports to Great Britain can also be explained using this model.

CHAPTER FOUR: GROWTH OF CATTLE AND TRANSPORT INDUSTRIES, 1900-50

Competition emerged in the national transport industry in the first half of the twentieth century. The western monopoly of the C.P.R. was compromised by the introduction of two new trans-continental railways and the motor truck. The prairies began to increase their share of the national cattle processing industry, but continued to export large numbers of cattle. The period was extremely turbulent, with two World Wars and the Great Depression. The year 1950 has been chosen as a closing point for this chapter because the end of the war ushered in a period of relative calm, quite different from the events of the previous 50 years. This chapter examines the development of the cattle transport industry to 1950 in two parts: transport and the cattle and beef industries. A summary concludes the chapter.

It is interesting to note the development of statistical sources during this period. Although statistics for the early period are sparse, the quality and availability of information improved dramatically in the late 1920's. By 1950, a vast array of data series were

available annually, many of which provide useful information of railway and cattle industry activity. As a result, the data presented in this chapter are better for the later years.

4.1 Transport Developments

This section is divided into several parts. Section 4.1.1 discusses the expansion of the railway network. Section 4.1.2 examines the regional importance of the railways and the importance of livestock freight to the railways. In section 4.1.3, rail rates and the rate-related regional complaints are addressed. The development of trucking and competition in the transport industry is scrutinized in section 4.1.4, and section 4.1.5 looks at regional and international shipments of cattle and beef.

4.1.1 Rail Network Expansion

The first decade of the twentieth century was an expansionary period in North America. Optimism was high, and there was a drive for more railway development. In the west, newspapers and railway boosters were pushing for an additional trans-continental railway that would promote competition in the industry. As during other Canadian railway

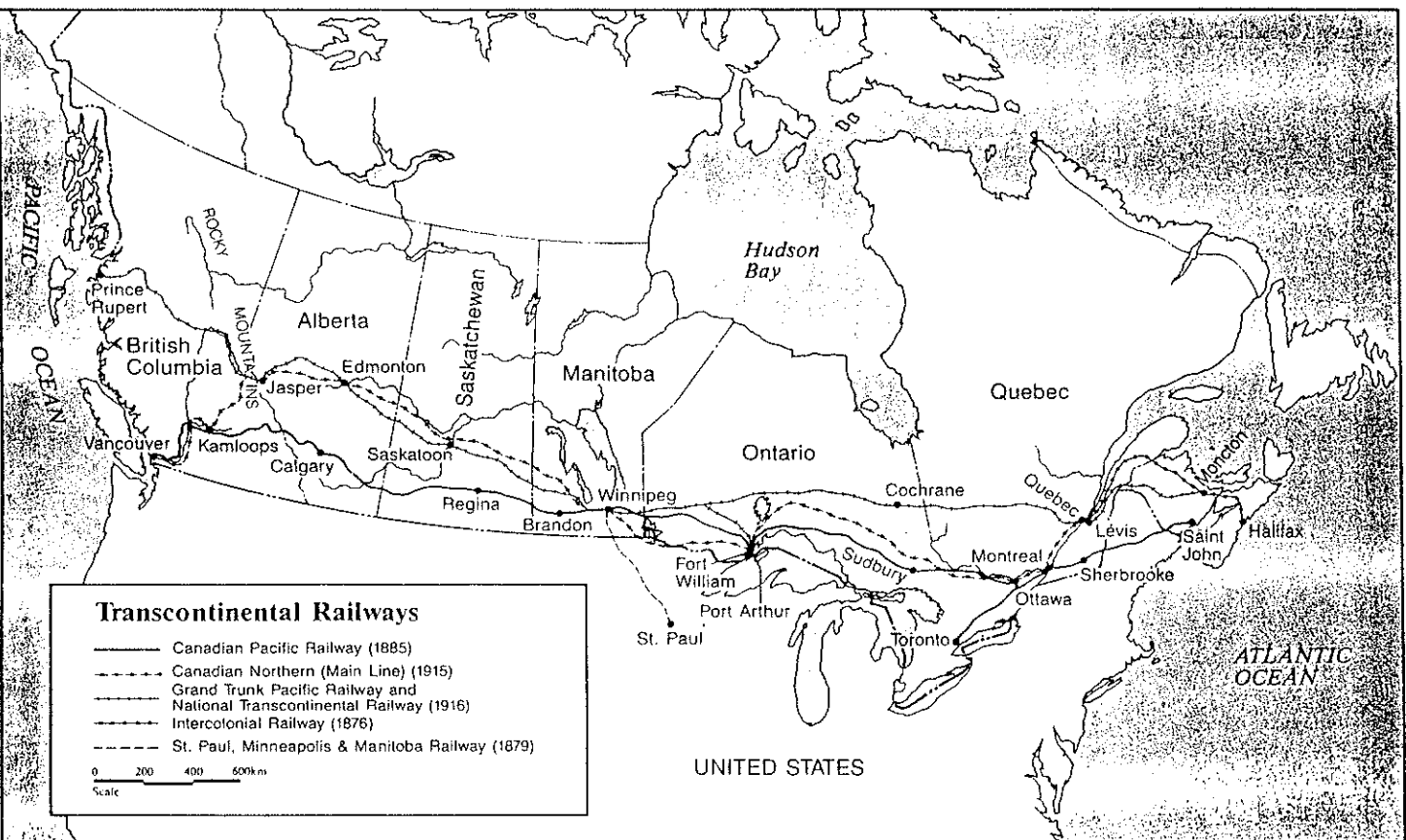
building periods, capital from the U.S. and Great Britain was available to invest in more railway infrastructure.

The C.P.R., according to railway boosters, had reached its capacity limits, and the time was ripe for more railway companies to infiltrate the trans-continental market. Around 1900, two railways, the Canadian Northern and the Grand Trunk Railway (G.T.R.) began to consider expanding to become trans-continental operations. The Canadian Northern was a small railway operating a few lines in the west, principally in Manitoba, from Winnipeg to the lakehead. The Grand Trunk Railway was a large eastern Canadian operation with ties to Chicago. While it seemed logical for the two companies to form some kind of merger, they were unable to reach an agreement. The G.T.R. offered to buy the Canadian Northern on several occasions, and the smaller railway was willing to sell, but the two parties could not agree on a suitable price. Even government intervention was unable to resolve the dispute. The government, however, was firmly in favour of a second trans-continental railway. It was the liberal government of Laurier that brought up the idea of a second "northern" trans-continental railway, principally to gain political support in Manitoba during the 1896 election.

The government decided that since no solution could be reached, it would build a line from Winnipeg to Moncton, north of Lake Superior, which would be leased to the G.T.R. for fifty years after completion. The rental rate would be three percent of the cost of construction per annum. The government-owned line was called the National Trans-

Continental. The Grand Trunk Pacific (G.T.P.) was incorporated to build a line from Winnipeg to the west coast, with the help of low-interest government-secured loans. Construction on the G.T.P. began in 1905, and the route followed Flemming's original route, northwest from Winnipeg to Edmonton via Saskatoon, and into British Columbia through the Yellowhead pass. The G.T.P. was completed in 1914, while the eastern portion, the National Trans-Continental was completed in 1917, but at a cost 200 percent greater than originally estimated. Due to the extremely high cost of construction, the G.T.R. was unwilling to lease the National Trans-Continental line north of the lakes.

Meanwhile, the Canadian Northern was constructing its own lines following roughly the same route as the Grand Trunk Pacific, diverging only west of the Yellowhead pass, where the G.T.P. line went west to Prince George, and the Canadian Northern line went south to Vancouver. The railway was also busy purchasing already established railway lines in eastern Canada. The Canadian Northern opted to build their own line north of Lake Superior, despite the opposition of the government. The line constructed was of low quality, designed to be replaced after it was able to produce some revenue. Figure 4.1 is a map that shows the main lines of the transcontinental railways.



Source: Bliss, M. *Northern Enterprise: Five centuries of Canadian business*, (Toronto: McClelland and Stewart, 1987) p. 206.

By 1913, the pace of economic expansion had slowed. Immigration slowed, and the influx of British capital dried up. The fortunes of the railways turned decidedly for the worse. By 1917, both of the new transcontinental railways were in financial crisis. In 1918, the government was forced to take over the Canadian Northern, which then became known as the Canadian National Railway (C.N.R.). The G.T.P. failed in 1920, and its lines were entrusted to the government-run C.N.R., while the G.T.R. continued to operate in eastern Canada. By 1923, the G.T.R. had become part of the C.N.R., and there were two trans-continental railways in Canada. During the rest of the period under study, the only railway development was the construction of additional branch lines, particularly in the prairies. Figure 4.2 shows the construction of the first main track between 1860 and 1960. The major periods of construction are evident in the early 1880s and around the year 1914.

Figure 4.2: construction of first main track 1860-1960

Source: Leahy, F.H., and Urquhart, M.C. (eds) Historical Statistics of Canada (Ottawa: Statistics Canada in joint sponsorship with the Social Science Federation of Canada, 1983)

The government claimed that the C.N.R. would offer strong competition for the C.P.R. This was debatable: on one hand, the C.N.R. had deep pockets because it was backed by the government, but on the other hand, the railway was comprised of thousands of kilometres of redundant track, much of which was poor quality, and the railways that had been amalgamated to form the C.N.R. had a history of financial problems.

In summary, the construction of new trans-continental railway lines was intense during the first 15 years of the twentieth century. The new railway companies were expected to

remedy some of the western transport problems through the introduction of competition, however these companies proved to be unable to survive financially, and were eventually amalgamated into one government-operated railway, the Canadian National Railway. This period is characterized by the over-building of railways, especially north of Lake Superior, where it is unlikely that there ever was (or will be) enough traffic to support more than one rail line.

4.1.2 Composition of Freight Traffic

Traffic originating in the west became relatively more important to the railways during the first half of the century. In 1929, the prairie provinces comprised 27.8 percent of the Canadian population, while they accounted for only 19.8 percent of the freight loaded onto railway cars. By 1950, the prairie share of the population had decreased to 18.1 percent of the national population, while railway loadings had decreased only slightly to 19.7 percent of the national total. Table 4.1 shows the freight originating in the prairies for the years 1929 and 1950. It is useful to compare these two years because the 1929 figure represents the situation during the middle of the period under study, while the 1950 figure represents what was occurring as the period drew to a close. Since this data was only collected starting in the late 1920s, estimates for loadings at the beginning of the century are unavailable. However, it is reasonable to assume that the established pattern can be extrapolated backwards.

	Manitoba	Saskatchewan	Alberta	Canada
1929	5,644	7,048	10,081	114,601
1950	6,449	9,448	12,404	144,031

Source: Statistics Canada, Railway Freight Traffic, SC 52-205, 1929, 1950

Cattle made up only a small part of railway revenues. In 1929, cattle were 0.56% of total tons moved in Canada by the railways. In 1950, this figure had dropped to 0.41% of tons carried by the railways. Meat (including pork and poultry) was 0.64% of tons carried in 1929, and 0.44% of tons moved in 1950. The amount of meat loaded by the railways is a proxy for the amount of beef, which is of central importance. Silver (1994) indicates that the majority of the meat shipped from Winnipeg at the turn of the century was pork, but it is likely that beef shipments increased in the first half of the century due to the packing plant expansion in Winnipeg. It is important to keep in mind the fact that these figures refer to meat, a category of which beef is only a subset. Table 4.2 shows the amounts of cattle and meat moved in 1929 and 1950.

Table 4.2: Cattle and Dressed Meat Traffic Loaded by Canadian Railways, 1929 and 1950, thousand tons

	Manitoba		Saskatchewan		Alberta		Canada	
	Cattle	Meat	Cattle	Meat	Cattle	Meat	Cattle	Meat
1929	124	26	71	10	130	22	638	729
1950	83	63	136	20	177	48	592	628

Source: Statistics Canada, Railway Freight Traffic, SC 52-205, 1929, 1950

While cattle made up only 0.56% of total traffic in 1929, the commodity occupied a position of much greater importance on the prairies, where cattle originating from Manitoba, Saskatchewan and Alberta were 2.19%, 1.0%, and 1.29% of the respective provincial loadings. In addition to this, loadings of meat on the prairies were *lower* than

the levels seen in the rest of Canada, comprising 0.46%, 0.14%, and 0.22% of the loadings in the respective provinces, while the ratio was 0.64% for the whole of Canada. This shows that in 1929, the prairies loaded more than their share of cattle, and less than their share of meat.

In 1950, the picture is more balanced. The proportion of total provincial freight loadings occupied by cattle declined in both Manitoba and Alberta, while there was a modest increase in Saskatchewan. In 1950, meat loadings were a higher proportion of freight loadings than they were in 1929 for each of the prairie provinces. The same is true for cattle. Nonetheless, in both years the prairies shipped more than their share of cattle, and less than their share of meat. However, this imbalance was more pronounced in 1929 than in 1950. This is consistent with the expansion of processing that took place in Manitoba.

4.1.3 Freight Rates and the Freight Rate Structure

The freight rate structure underwent several important changes in the first half of the century, although none of these changes were enough to eradicate the constant grumbling present in the west. This section concentrates on railway rates because there is no information about truck rates, except that these rates were not regulated in the same manner as the rail rates. There is no published data on truck rates, but it is very unlikely

that trucks were competitive with rail over the long distances that are relevant to this discussion. The next section touches on the competitiveness of trucks over various distances.

In 1903, the federal government established the Board of Railway commissioners to regulate the railways. Under Board rules, the railways had to publish all of their rates, and if they wanted to increase the rates, they had to apply through the Board to do so. The Board also was the forum before which freight rate grievances were heard.

From 1906 to 1914, several Western Canadian groups presented their cases to the Board of Railway Commissioners. In the Coastal Cities Case (1906), several cities in British Columbia complained that the lower rates that Winnipeg enjoyed were against the national interest and unfair to other western centres. In 1911, some Winnipeg merchants complained that they had been treated unfairly by the C.P.R., who had promised to lower their rates as traffic increased, but had not done so. These, and other, cases were not always successful, but the flood of complaints forced the Board of Commissioners to examine the structure of rates in the west. In 1914, the class rate system was amended and simplified. Also in 1914, the Panama Canal was completed, and this created transcontinental competition for the railways for freight that was not subject to significant time pressures.

The end of World War I was met by rapid inflation that pushed up costs and forced the railways to apply for rate increases. This was the first time since the formation of the Board of Railway Commissioners that the railways had applied to increase their rates. By 1920, the transcontinental railways had been competing with U.S. transcontinental railways and ships for several years. In response to this competition, the railways developed "transcontinental rates" that could compete for traffic crossing the continent. These low rates did not affect rates to intermediate destinations such as Calgary, Regina and Winnipeg. Around this time, Alberta began to complain loudly that they were at the "apex" of the freight rate structure. This phenomenon is called short haul/long haul discrimination by transport economists. In a few well-publicized cases, the cheapest route for a shipment of goods from Eastern Canada bound for Alberta was found to be via Vancouver.

In 1925, the Crowsnest Pass Agreement of 1897 was legislated into statute; the new legislation was really a descendant of the previous agreement because there were some important changes to the levels of allowable rates. Over the years this legislation was extended to include grain by-products and specialty crops. In 1938, in the face of increasing truck competition, new legislation was passed that allowed railways to make "agreed charges" with shippers. These charges were in the public domain so that all shippers could see the rates that other shippers were getting. Under this legislation, if a shipper could show that he was in similar circumstances to another shipper who was receiving an agreed charge, that shipper would be entitled to the same rate. Agreed

charges were not used extensively before World War II, but after the war they became important because they were used by the railways to circumvent other more constricting regulations.

Due to the high demand for meat and meat products in Europe during the war years, the Feed Grain Act was passed in 1941. This act subsidized the transport of western feed grains to the east where they were fed to livestock. This act was intended to remain only as long as the war was unresolved.

The influx of truck competition and the period of Great Depression did not precipitate any increases in rates. Wage and price controls implemented during the war also postponed the need for rate increases. After the war when price controls were lifted, the railways were forced to apply for a series of massive rate increases. In 1947, when the price controls were lifted, the railways applied for a 30% increase in their rates. The increase granted, 21%, was the first in a series of increases that would not subside until major legislative changes had taken place.

In response to persistent squabbling, the government appointed the Turgeon Commission in 1948 to address the long-standing grievances related to the freight rate structure. The report of the Turgeon Commission, released in 1955, is discussed in chapter five.

It must be carefully noted that most of the goods shipped by the railways did not move under class rates. Many of the commodities moved by rail received "commodity rates", which were special lower rates for the more bulky commodities such as coal and sulphur. Further, after 1938, the railways began to use agreed charges, and these charges were not published, although they were in the public domain. The published rates are widely considered to be an indicator of the general rate level, although shippers rarely paid the published rates.

Table 4.2 shows the freight rates charged on cattle and meat shipped to the east from Edmonton and Winnipeg. The freight rate structure was such that the rate for a shipment to Montreal was the same as the rate for a shipment to a point closer to Winnipeg. Thus, the rate from Winnipeg to Montreal was the same as the rate from Winnipeg to Toronto. This arrangement had little effect on the location of cattle processing.

Table 4.3: Freight Rates: Cattle and Meats in Carload Lots from Specified Stations in Western Canada to Points in Eastern Canada, Montreal and West thereof, by Effective Date

	Winnipeg		Edmonton	
	Cattle	Meats	Cattle	Meats
	cents per cwt			
15 Aug. 1921	85	121	114.5	188
8 Apr. 1948	103	146	139	227
11 Oct. 1949	111	158	150	245
23 Mar. 1950	119	169	161	263
16 Jun. 1950	124	175	167	272

Source: Statistics Canada, Livestock and Animal Products Statistics, SC 23-203, 1919-1950

This table clearly shows the significant rise in rate levels that occurred in the years immediately following the second world war. Freight rates had remained unchanged for 27 years, but after 1948, applications for rate increases were much more frequent. The table also shows the differential rates charged on cattle and meat, and the difference was bigger for Edmonton than for Winnipeg. That is to say that the differential between cattle and meat rates was higher in Edmonton than in Winnipeg, both in the 1920's and in 1950.

In summary, in the first half of the century there were no solutions to the regional difficulties with the freight rate structure. However, the complaints had not yet reach climactic proportions because other macro events deflected attention away from the freight rate issue. Dissatisfaction with freight rate disparities did not disappear, although they

were relatively silent for many of these years. The general level of freight rates remained stable for the most part, only beginning to increase after the second world war, at which time the regional complaints skyrocketed.

4.1.4 Development of Trucking and Competition in the Transport Industry

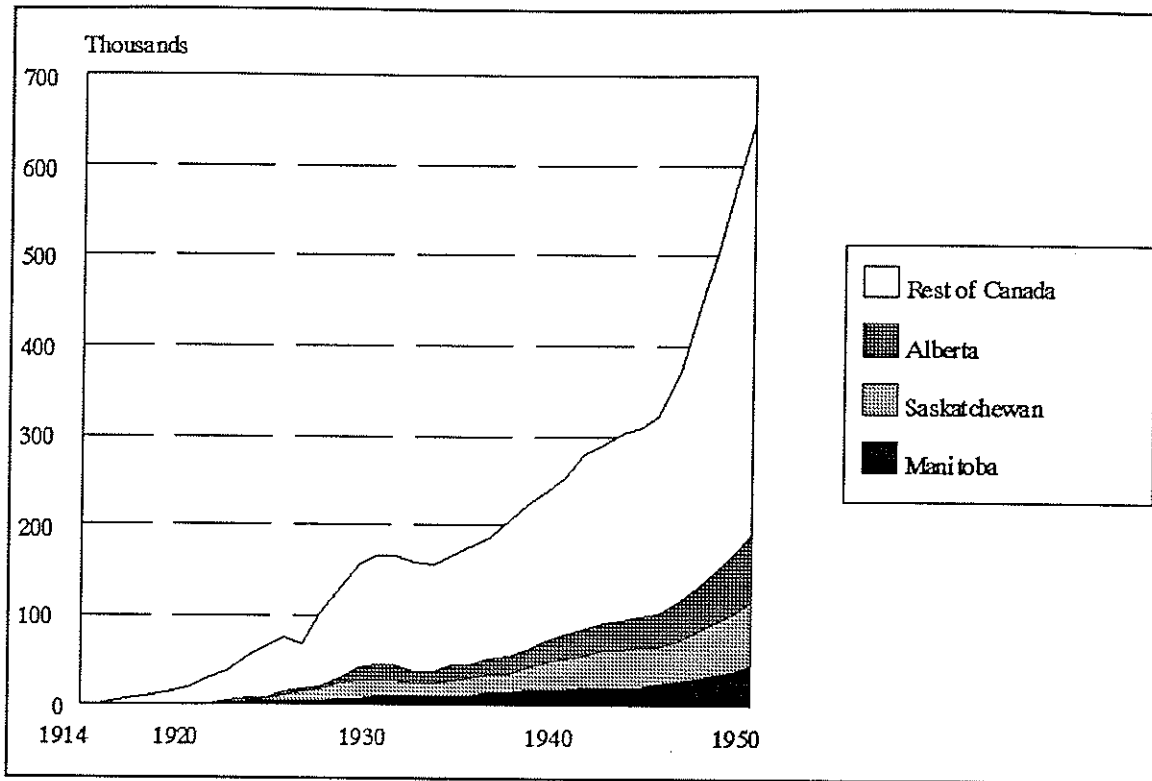
The internal combustion engine was well-developed by the end of the first decade of the twentieth century, and this innovation soon led to the introduction of the motor car and truck. Initially, the road system consisted of small dirt roads that were suitable only for wagons and bicycles. By 1925, automobiles were cheap and reliable. The provinces have always taken an active role in the construction of roads, and during the first part of the century they invested heavily in surfacing and expanding the road system.

In 1931, the federal government made grants to construct the Trans-Canada highway. By 1940 the highway was completed and truck and automobile traffic could drive from coast to coast without having to pass through the United States. In 1948, the Trans-Canada highway was upgraded so that all roads had hard surfaces. There were also major technological improvements in the efficiency of automobiles and trucks. Currie (1967) notes that between 1926 and 1939 the operating costs per vehicle mile were halved. Before 1950, improvements in truck design had produced larger and larger trucks and semis.

Entry into the trucking industry was controlled by the Public Convenience and Necessity test. To operate a trucking undertaking, a license or operating authority was required. In order to acquire an operating authority, truckers had to apply to the provincial government and show that it was in the public interest that they be granted the right to operate. The burden of proof was on the applicant. Nonetheless, the numbers of trucks on the roads increased at a fast pace. While data on operating authorities are not available, figure 4.3 shows the registrations of commercial vehicles from 1914 to 1950. This data is unavailable for the years before 1914.

The railways were in favour of the regulation of truck rates, but it was soon found that any such regulation was impracticable. The railways complained the competition from trucks was unfair because of the higher tax burden and levels of regulation that affected the railways. Trucks were able to offer faster and more flexible service than the railways, and the railways met this competition with faster service, the introduction of agreed charges, incentive rates and piggy back shipping.

Figure 4.3: Registration of Commercial Vehicles in Canada, 1914-1950



Source: Statistics Canada, *The Motor Vehicle*, SC 52-203, 1950

According to Currie (1967), the growth of the trucking industry was retarded by the Great Depression and World War II. "It wasn't until 1950 that highway carriers began again to tense their muscles" (Currie, 1967: 477) Nonetheless, by the end of the 1940s, truckers had begun to erode the high-value railway freight and the short haul railway activity.

Table 4.4 shows the shares of total inter-city ton miles performed by mode. The road carriers continuously increased their market share until the end of the period, even though, according to Currie, they had yet begun to 'tense their muscles'.

During this period, the most important impact of trucks affected short-haul traffic. The railways have never been effected at hauling goods over short distances; the rail mode is geared towards long-haul moves. Trucks, however, were ideally suited to short-haul moves due to their flexibility and door-to-door service. As a result of the short-haul advantages of trucking, cities became better connected to the surrounding country.

	Total (billions)	Rail %	Road %	Water %
1938	53	51	3	46
1946	77	72	5	24
1951	105	61	8	30

Source: Currie, A.W. Canadian Transportation Economics, (Toronto: University of Toronto Press, 1967)

The trucking industry found that it was easy to compete with the railways for the most valuable traffic - high valued goods. The truckers could offer door-to-door service with less handling, and more flexible departure times. Currie (1967) also notes that trucks provided better supervision over refrigerated cargoes. Trucks were not competitive over large distances, and so most of the railway traffic that was diverted by trucks was for short hauls. It is estimated that in 1926 trucks were competitive with railways for 50-60 mile hauls, in 1940, the radius had expanded to over 100 miles, and some trucks were completing hauls as long as 1000 miles carrying consumer goods and perishable items (Currie, 1967, 489-90). In 1950, the Vice-President of the C.P.R. admitted that the railway hauled almost no traffic over distances less than 100 miles.

In summary, the first half of the century witnessed the birth and early life of the trucking industry. Trucks began to compete with railways for high-valued, short haul traffic. The technology of trucks changed at a fast pace, and the trucker's radius of competition expanded rapidly.

4.1.5 Cattle and Meat Shipments

Many cattle were shipped from the western prairies to stock yards, abattoirs and feed lots in eastern Canada. As the decades passed, the number of cattle shipped to the east remained relatively constant, while the numbers being processed in the prairies grew significantly. Unfortunately, detailed statistics for provincial shipments of cattle and meat are available for only a handful of years in the middle of the period. Table 4.5 summarizes the number of cattle slaughtered on the prairies and shipped east for the years 1925-50, at five year intervals.

Table 4.5: Number of Cattle Slaughtered in Prairies and Number Shipped East, 1925-50, thousand head					
	Cattle in Prairies	Slaughtered in Prairies		Cattle Shipped East	
		#	%	#	%
1925	2,557	323	12.6	241	9.4
1930	2,210	288	13.0	77	3.5
1935	2,502	521	20.8	189	7.6
1940	1,949	649	33.2	131	6.7
1945	3,210	1,401	43.6	144	4.5
1950	2,137	841	39.4	151	7.1

Source: Statistics Canada, Livestock and Animal Products Statistics, SC 23-203, 1919-50

Clearly, the number of cattle slaughtered in the prairies increased significantly during this period, while the cattle supply, and the number of cattle shipped east did not show such a strong trend. Naturally, the ratio of cattle shipped to cattle slaughtered in the prairies declined over the period. The statistics for the year 1945 are slightly higher than would have been without the second World War.

The cattle shipped east were shipped to stock yards, feed lots and abattoirs. Cattle going to a stock yard were auctioned off, while those going to abattoirs were slaughtered, and those going to feed lots were fattened up in preparation of slaughter. It is extremely interesting to note that the Feed Grain Act made it possible and even economic to ship western cattle to the east to be fattened up on western grain shipped to the east for the

purpose of feeding livestock. As interesting as this phenomena is, it is not the focus of the present study. Based on data from SC 23-203, the disposition of cattle shipped from western Canada to the east (for the years 1935-48) was 30.1 percent to feed lots, 35.8 percent to stock yards, and 34.2 percent to packing houses. All cattle shipped to stock yards were eventually shipped to either feed lots or packing plants. Cattle going to feed lots were fed for a period of time before they were slaughtered. Approximately half of the cattle in stock yards went to feed lots, and the other half went to packing plants.

The logistics of cattle shipping were changed by the development of the motor truck. Trucks did not have pre-set delivery and pick-up points, and they quickly became the method of choice for moving cattle off of farms. Before truck transport, cattle had to be driven to the nearest railway loading point, where they were loaded onto trains and shipped eastward. The trains loaded at country points did not necessarily unload cattle in the closest major centre - many cattle were shipped through to Winnipeg where they were unloaded, fed and watered. This turned out to be an advantage for the Winnipeg meat processing industry, which siphoned off some cattle for slaughtering.

As trucks began to carry more livestock from farm to rail loading point, the processing undertaken at major prairie centres other than Winnipeg began to expand. Winnipeg, as the trans-shipment point for the large flows of cattle moving eastward, was able to slaughter some of the cattle passing through its stockyards. As truck deliveries to rail loading points increased, other cities on the prairies were able to take advantage of a

similar situation, albeit on a much smaller scale. After all, if a large group of animals had to be unloaded from trucks and then loaded onto trains, there was an opportunity to increase the local cattle slaughtering.

The cattle shipped east originated in all three prairie provinces, and were destined for Ontario for the most part. Significant amounts of cattle also were shipped to Quebec, presumably to Montreal. For Saskatchewan and Alberta, the most significant interprovincial shipments of cattle were to Manitoba during this part of the century. This is consistent with the rise of meat packing in Manitoba that occurred during the first part of the century. This increase in cattle slaughtering in Manitoba is discussed further in section 4.2.1.

All of the long haul movements of cattle were undertaken by the rail mode. To the year 1950, trucks were not competitive over the necessary distances and could not offer much better service than the rail carriers who had invested heavily in stock yards and loading and unloading facilities.

Information about interprovincial shipments of meat is sparse. In 1925, which can be looked upon as a representative year, Manitoba moved beef to eastern Canada, as well as to other export destinations such as the U.S. and U.K. Alberta's only interprovincial shipments of beef were to British Columbia, and Saskatchewan moved no beef to other provinces, exporting only a small amount to foreign countries. The amount of beef

shipped to eastern Canada was equal to approximately 15.6% of the 1925 prairie beef production, which was the beef equivalent of about 50,000 cattle, while 241,000 cattle were shipped live in that year. It is reasonable to believe, given the other evidence presented, that this trend improved with time.

In summary, the prairie provinces shipped both cattle and beef to eastern Canada. Most of the beef originated in Manitoba, while large shipments of cattle came from all of the prairie provinces. The cattle were carried by rail to the east, where they were delivered to feed lots, stock yards and packing houses. As the meat packing industry in the prairies began to expand (principally in Manitoba), a greater proportion of cattle were slaughtered on the prairies, compared to the amounts shipped to eastern Canada. Cattle from all of the prairies were funnelled into Manitoba for ultimate consumption in Ontario and Quebec. Manitoba was able to take advantage of its position as a trans-shipment point to perform weight-losing production on cattle. Other major prairie centres were also able to reap some benefits from their positions as smaller trans-shipment points.

4.2 Development of the Cattle and Beef Industries

This section is divided into three parts. The first part is an examination of changes in the cattle supply and location of cattle processing industry during the first half of the century. Following this is a look at cattle prices at different country points and finally is a brief

summary of the domestic and international markets for cattle. The material presented in this section, combined with the information presented in section 4.1 is a necessary background for a closer analysis of cattle transport in the first half of the twentieth century.

4.2.1 Cattle Supply and Location of Slaughtering Activity

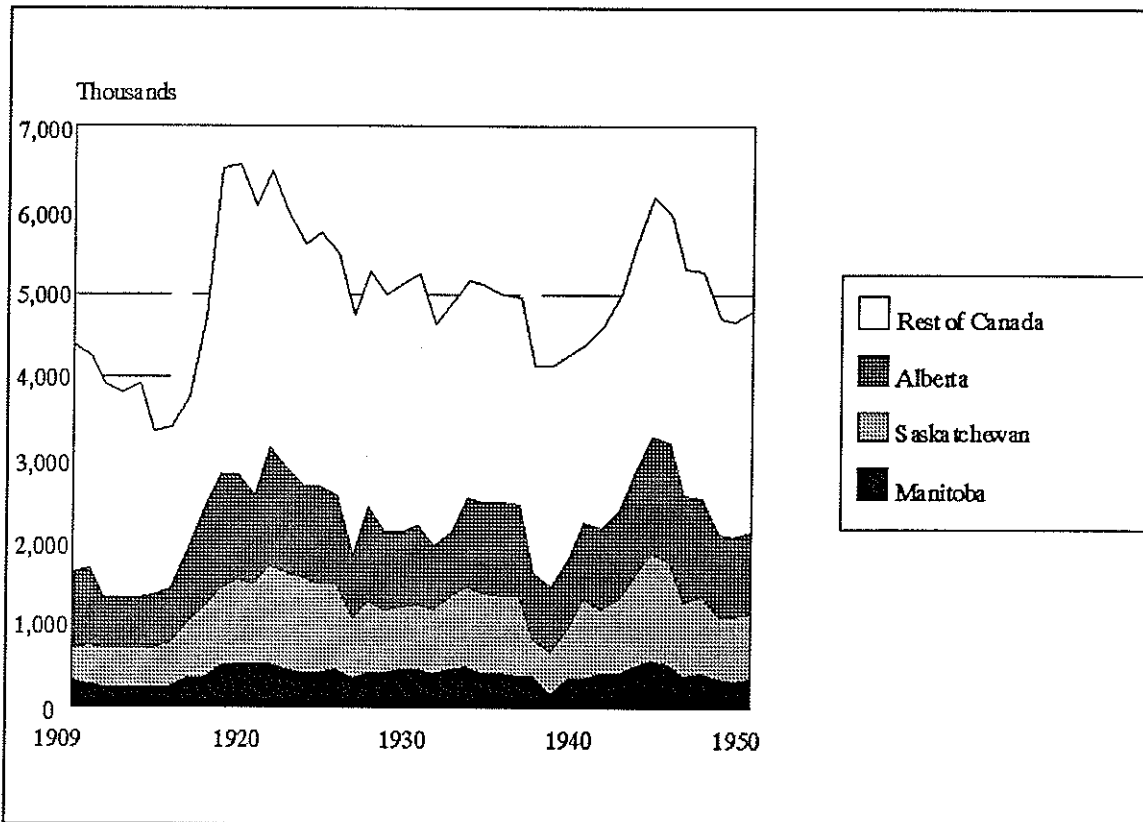
The first half of the new century saw the creation of two new provinces and dramatic influxes of population into the west. The new population began to encroach on some of the prime lands that were being used for stock raising. This encroachment, and other factors such as the oligopolistic pricing practices of the cattle buyers, pushed the smaller stockmen out of specialized cattle raising and into mixed farming.

Throughout the period, the numbers of cattle in Canada fluctuated widely and had a slight upward trend. Figure 4.4 shows the numbers of non-milk cattle in Canada from 1909 to 1950. Figure 4.4 is an area graph that also contains information about the numbers of cattle in each of the prairie provinces.

At the beginning of the series presented in figure 4.4, the number of cattle is relatively low. This relative minima is a result of particularly low prices, but a strong recovery was made in the face of higher prices around the time of the first World War. A large dip in

the number of cattle before World War II is the result of increased slaughtering. After the war, the numbers of cattle experienced a gradual decline until the second World War, when stocks increased again.

Figure 4.4: Number of Non-Milk Cattle in Canada, 1909-1950



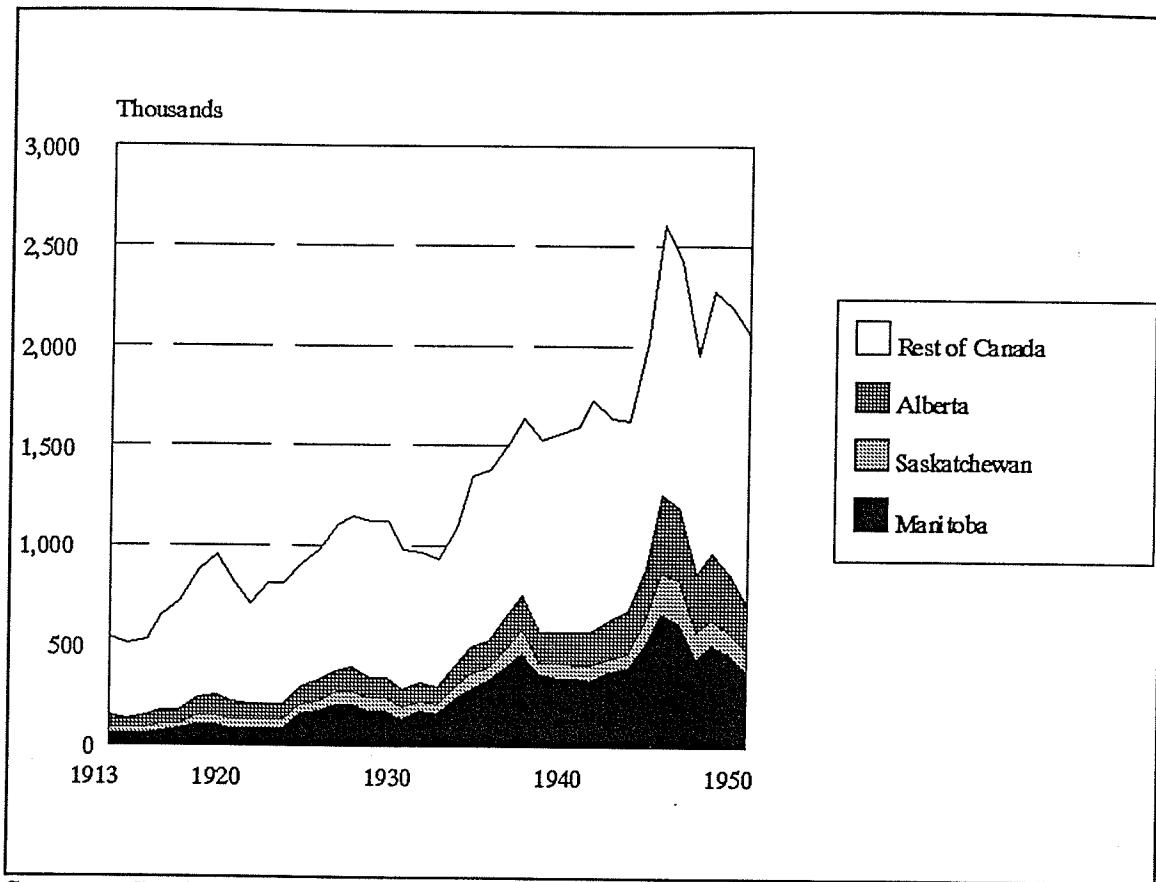
Source: Statistics Canada, Livestock and Animal Products Statistics, SC 23-203, 1919-50

The slaughter of cattle is the process of turning live cattle into meat, and it is of central importance to this study. The location of cattle processing gradually shifted in favour of the prairie provinces in the first half of the century. Data for this series are unavailable

for years prior to 1913. Figure 4.5 shows the slaughter of cattle in inspected establishments for the prairie provinces and for the rest of Canada. The figure is analogous to figure 4.4, which showed the supply of cattle.

The numbers of cattle slaughtered in federally inspected establishments showed a strong upward trend in the first half of the century. This reflects an increasing demand for meat products and the tendency to slaughter more of the cattle domestically. There is a large spike just after the second World War, which reflects a relaxing of the wartime restrictions on consumption.

Figure 4.5: Cattle Slaughtered in Federally Inspected Establishments, 1913-50



Source: Statistics Canada, Livestock and Animal Products Statistics, SC 23-203, 1919-50

A comparison of figures 4.4 and 4.5 shows that the western provinces slaughtered less than their proportion of the total cattle supply. In 1920, for example, the western provinces contained 42% of the national supply of non-milk cattle, while these same provinces had only 26% of the total number slaughtered. This inequity became less pronounced as the period came to a close. In 1950, the western provinces contained 45% of the national supply of non-milk cattle, and 36% of the slaughtered cattle were processed on the prairies.

A more detailed examination of the data gives an idea of the distribution of cattle supply and slaughter between the provinces. In 1920, Manitoba contained 21% of the cattle of the prairie provinces, but conducted 41% of the prairie slaughtering, while Saskatchewan contained 38% of the prairie cattle, but undertook only 20% of the slaughtering. In 1920, Alberta had 41% of the prairie cattle supply and undertook 39% of the slaughter. Table 4.5 shows the proportions of the prairie cattle supply and slaughter in the prairie provinces for the years 1920, 1930, 1940, and 1950.

Starting around 1920, a gradual increase in the number of cattle slaughtered in the prairies is evident. This increase can be attributed to the influence of more truck deliveries to loading points, leading to increased collection at major centres and some additional opportunities for slaughtering. The use of trucks gave producers greater flexibility in shipping cattle to processors.

	Manitoba		Saskatchewan		Alberta	
	% of cattle	% of slaughter	% of cattle	% of slaughter	% of cattle	% of slaughter
1920	21	41	38	20	41	39
1930	22	48	36	18	43	34
1940	19	60	34	12	47	28
1950	18	53	35	13	47	33

Source: Statistics Canada, Livestock and Animal Products Statistics, SC 23-203, 1919-50

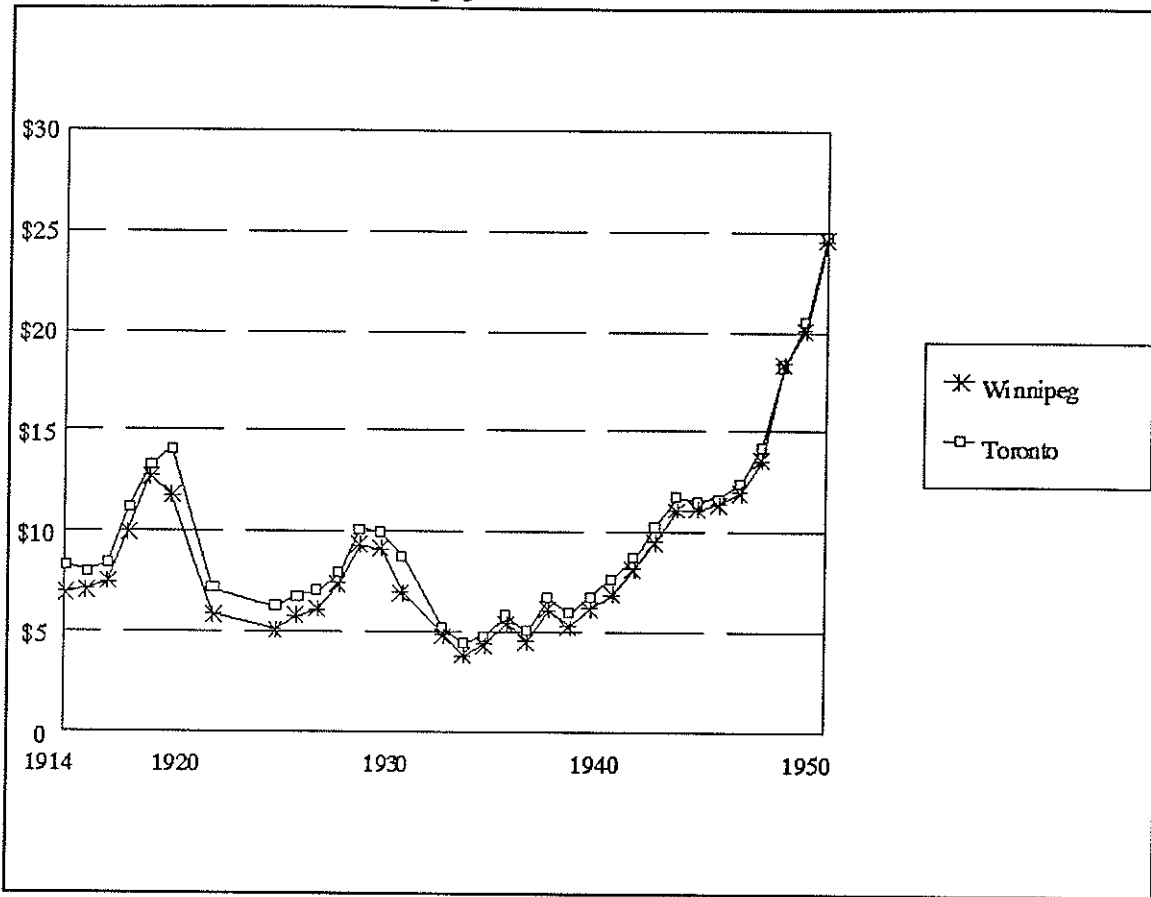
It is apparent from table 4.6 that the province of Manitoba consistently undertook more than its share of the slaughtering on the prairies, while producing less than its share of the cattle. The big loser from all of this was Saskatchewan, which consistently slaughtered less than its share of the cattle. Alberta also slaughtered significantly less than its share of the prairie cattle supply.

4.2.2 Cattle Prices

There is a strong correlation between cattle prices in eastern Canada and cattle prices on the prairies. Specifically, the prices on the prairies are generally lower than the prices in eastern Canada, and the difference between the two prices is usually approximately equal to the cost of transporting an animal from the west to an eastern market.

Figure 4.6 shows the prices for good cattle up to 1000 lbs. in Winnipeg and Toronto. The two series of prices are highly correlated, with the Toronto prices sometimes exceeding the Winnipeg prices by as much as 20 percent, or as little as 1 percent.

Figure 4.6: Annual Average Prices of Good Cattle of up to 1000 lbs, \$ per cwt, Toronto and Winnipeg



Source: Statistics Canada, Livestock and Animal Products Statistics, SC 23-203, 1919-50

Cattle prices throughout the system vary naturally as a result of supply and demand. In the prairies, Silver (1994) has indicated that the firms of Burns, and Gordon, Ironsides and Fares, followed monopsonistic practices in the market for purchasing cattle in the early years of the century. These firms were the two largest purchasers of cattle in the prairies, and there is some evidence that they colluded to set the prices of cattle. Burns used their cattle for processing, while Gordon, Ironsides and Fares shipped their cattle to eastern Canada and to Chicago. The alleged collusion apparently took the form of low levels of

competition at stock yards and markets. At any given stock yard or market, there would be as many as three separate buyers of cattle, but all of the buyers would represent one firm, either Burns, or Gordon, Ironsides and Fares. The buyers for these firms tended to set the price of cattle at the market because of the large volumes that they purchased, and small stock owners were forced to 'take it or leave it'. If a small stock owner did not accept the price offered by the buyer, he had little recourse. Larger stock owners could ship their cattle in unit trains through to Chicago, Toronto or Montreal in hopes of getting a better price, but in this case they bore the risks associated with the transport.

According to Silver, the firm of Gordon, Ironsides and Fares showed little interest in entering the cattle processing business, preferring to remain the largest cattle exporter in the world. It is difficult to grasp the reasons for this preference, primarily because of the apparent profitability of processing cattle in the prairies (particularly Manitoba). For most of the period under observation, there is a consistent margin that separates the Toronto prices from the Winnipeg prices. However, in the last three years of the 1940s, this margin appears to disintegrate. The reason for this is that the price data presented in figure 4.6 are annual averages, and these averages may be distorted for the years of rapid price inflation that followed the second World War. The reader will recall that in these years the railways introduced massive rate increases, at times more than once per year. It is for this reason, and the general instability of prices in the economy, that the consistent margins seen in the earlier years are not easily observable in the late 1940s. Another

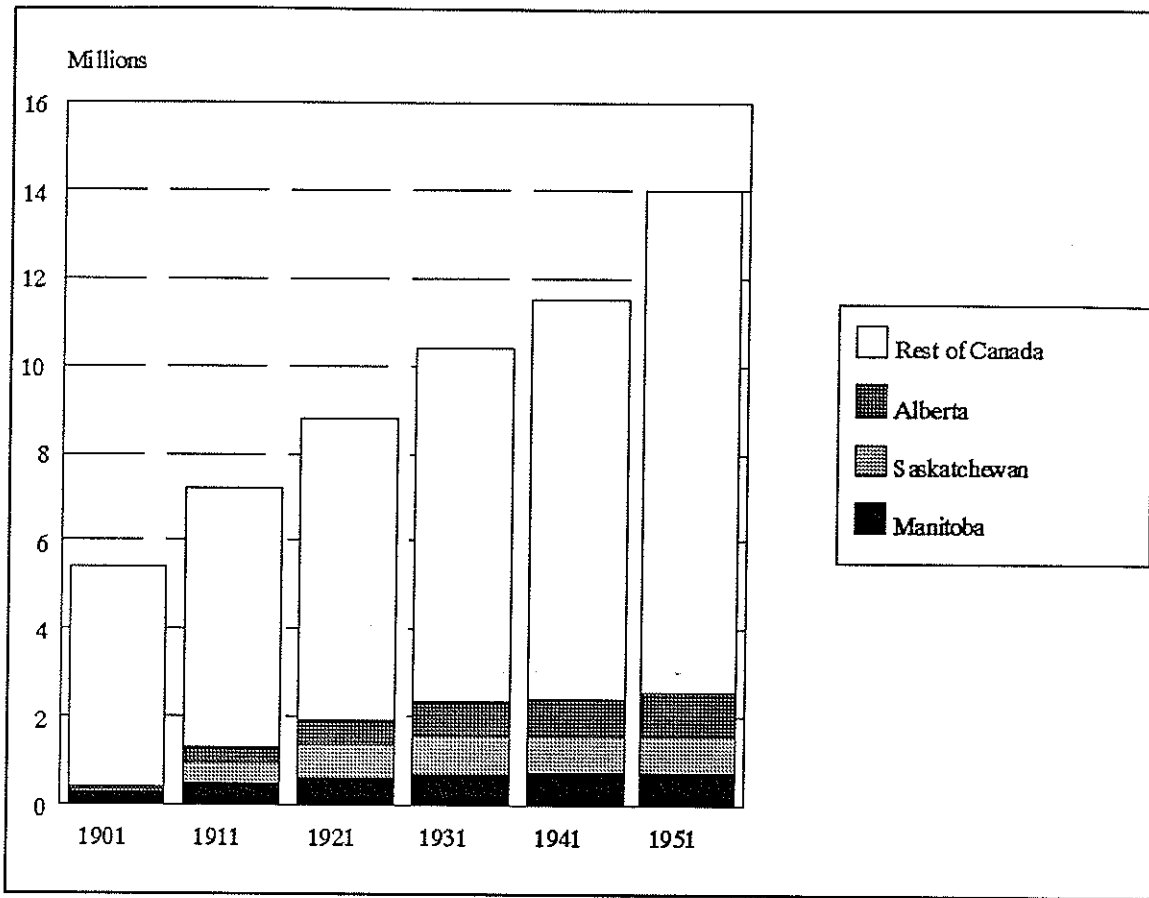
possible explanation for this phenomenon is the dramatic increase in cattle slaughtering that took place as the wartime consumption limits were removed.

In summary, cattle prices in western and eastern Canada were highly correlated over the first fifty years of the twentieth century. Prices skyrocketed following the second World War when the economy experienced significant inflation. Cattle producers in the west had few choices when selling their animals, and the buyers of cattle appear to have used oligopolistic practices.

4.2.3 Domestic and International Markets for Cattle and Meat Products

The largest domestic markets for beef products (and hence cattle) were found in eastern Canada for the first half of the century. The national demand for meat products is closely related to population - centres with large populations have a large demand for meat products. Although the prairie provinces contributed significantly to the production of meat products, there was only a small local demand. Figure 4.7 is a bar chart that shows the population in the prairie provinces and in the rest of Canada in six census years.

Figure 4.7: Population in Canada and Prairie Provinces for Census Years 1921-51



Source: Leahy, F.H., and Urquhart, M.C. (eds) Historical Statistics of Canada (Ottawa: Statistics Canada in joint sponsorship with the Social Science Federation of Canada, 1983)

While the prairie provinces produced more beef than necessary to meet local demands, the other provinces (as a whole), did not produce enough beef to cover local demands. Table 4.7 shows the amount of beef produced and consumed by the prairie provinces and the rest of Canada, for the census years used in Figure 4.7. The demand for beef was arrived at by multiplying the population of a region by the domestic per capita disappearance of beef, found in the Historical Statistics of Canada. The analysis assumes that the per

capita consumption of beef was constant across the nation, which tends to slightly overstate the gaps between consumption and production.

	Prairie Provinces		Rest of Canada	
	Consumption	Production	Consumption	Production
1921	100	133	350	342
1931	115	164	388	333
1941	142	238	530	485
1951	125	275	564	510

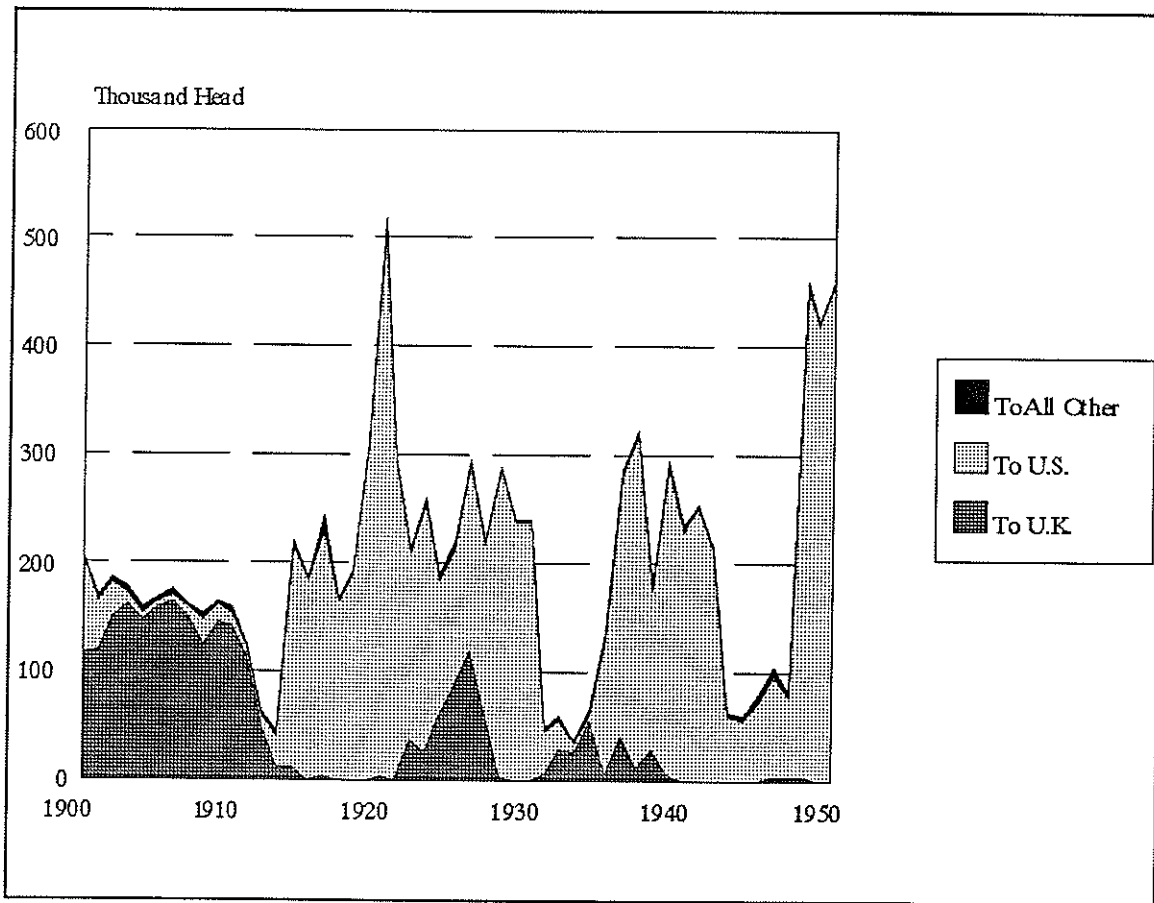
Source: Leahy, F.H., and Urquhart, M.C. (eds) Historical Statistics of Canada (Ottawa: Statistics Canada in joint sponsorship with the Social Science Federation of Canada, 1983)

In the prairie provinces, production of beef was greater than consumption throughout the period, while in the rest of Canada, production was always less than consumption. The prairie provinces were a net exporter of beef products, while the rest of Canada was a net importer. Although the balance of beef trade is skewed, it is important to note that a significant portion of the beef produced in eastern Canada came from cattle raised in the west. The prairie provinces were also net exporters of cattle.

Early in the twentieth century, the larger prairie cattle producers lobbied for and got reduced rail freight tariffs for the exportation of cattle to the giant Chicago market. This was important to the stockmen because the Chicago market could absorb large amounts of cattle, and it offered an alternative to selling the animals to local slaughterhouses. The

prices in Chicago were very competitive, and after 1913, when the trade concessions were won, many western Canadian cattle were shipped to the mid-western metropolis. The status of tariffs on cattle varied throughout the first fifty years of the century, at times being cut, and then later re-instated. A glimpse at figure 4.8 shows that the numbers of cattle shipped to the U.S. oscillated between several hundred thousand and zero, and this variation is largely due to changes in the tariffs charged on cattle.

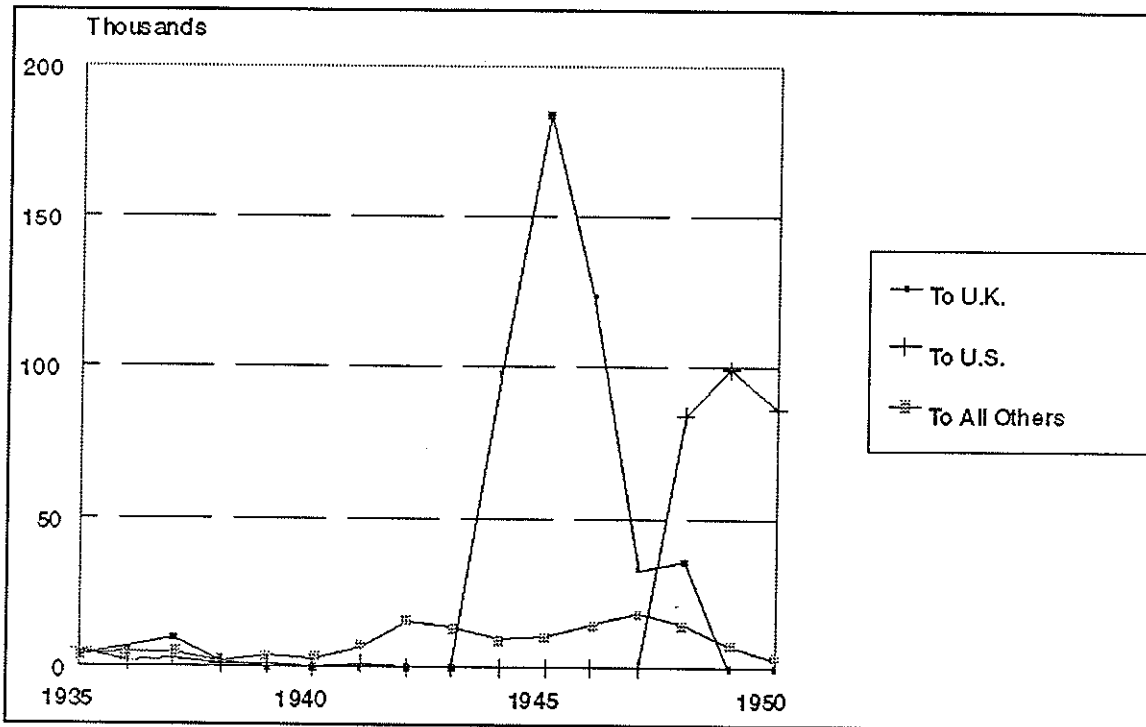
Figure 4.8: Canadian Exports of Live Cattle to the U.S, U.K., and All Other Countries



Source: Statistics Canada, Livestock and Animal Products Statistics, SC 23-203, 1919-50

Exports of live cattle to the U.K., combined with the exports to the U.S., composed almost all of the Canadian cattle exports during the first half of the century. Just as with the U.S., changes in U.K. trade policy are the major factor affecting the numbers of cattle shipped overseas.

Figure 4.9: Canadian Exports of Beef, 1935-50



Source: Statistics Canada, Livestock and Animal Products Statistics, SC 23-203, 1919-50

Data on the export of beef to the U.S. and overseas is unavailable prior to 1935. Since 1935, exports of beef have been primarily to the U.S. and the U.K., and these shipments

have been highly volatile. Exports of beef during the period have been as much as 11 percent of national beef production, to as low as 2% of total production. The amount of beef exported pales in comparison to the numbers of cattle exported, and the equivalent amount of beef that could be produced from the cattle. Beef exports from 1935-50 are shown in figure 4.9.

4.3 Summary and Conclusion

1. Other railways entered into competition with the C.P.R., leading to the creation of the government-run C.N.R. There is little evidence that suggests that this new competition forced a significant lowering of freight rates.
2. In the prairies, railway loadings of livestock were more important, and loadings of meat were less important than the national averages. The prairies shipped relatively more cattle and less meat than the rest of Canada, although this trend became less evident closer to 1950.
3. Freight rates remained stable until the post WWII era, when they began to increase rapidly.

4. Trucks began to compete with rail for short-haul, high-value traffic. Trucking's share of total ton-miles increased from 3% in 1938 to 8% in 1951.
5. The prairie provinces began to undertake more cattle slaughtering (principally in Manitoba, and a little in Alberta), but remained net exporters of cattle. Shipments of meat and numbers of cattle slaughtered in the prairies increased while cattle movements to eastern Canada remained fairly constant. The increase of slaughtering on the prairies was facilitated by the development of the trucking industry and Winnipeg's advantages as a trans-shipment point.
6. Cattle prices in western and eastern Canada moved in lock-step, rising dramatically with the freight rate increases after WWII. Cattle buyers in the prairies used market power to keep prices low and divide up the cattle supply. The firm of Gordon, Ironside and Fares became the largest cattle exporter in the world, but did not make any significant attempts to enter the packing industry.
7. Exports of cattle continued to fluctuate. The primary export markets were the U.S. (Chicago area) and the U.K. Exports of meat were also volatile.
8. The first half of the century was a period of great change in the transport and cattle processing industries. The rail monopoly appears to have been compromised, but the extent to which the long-haul business was affected remains

unclear. It is certainly possible that trucks could compete with the higher rail rates charged on meat between Winnipeg and Toronto, but not likely between points west of Winnipeg and Toronto. This possibility would help explain the rise of meat packing in Winnipeg during the last 15 years of the period. However, the economies of shipping beef over live cattle were not overwhelming because a large amount of cattle were still shipped to eastern Canada, straight to packing houses.

CHAPTER FIVE: FALL OF THE CATTLE TRAIN

This chapter examines the final years of the cattle train, from 1950 to the present. This period is characterized by large shifts in the patterns of cattle consumption (for the purposes of slaughter) and cattle movements. In 1950, there is little evidence of any cattle being shipped by truck to eastern Canada from western Canada, while in 1995 there is no evidence of any cattle being shipped by rail to the east, while some cattle are still shipped eastward, only now by trucks. U.S. markets for cattle are more important than ever for Canadian producers, and the cattle processing industry in Alberta has undergone remarkable growth in the past 45 years.

The fall of the cattle train will be described in two parts: developments in the transport industry, and developments in the cattle and beef industries. A summary concludes the chapter.

5.1 Developments in the Transport Industry

This section is divided into three parts. Section 5.1.1 examines legislation and transport policy in Canada from 1950, section 5.1.2 examines truck/rail competition, and section 5.1.3 analyzes competition in the transport of cattle from western to eastern Canada.

Absent from this chapter is a section on the development of the transportation infrastructure, which was included in the previous two chapters. Most infrastructural development that took place during these years is irrelevant to this study because it does not affect cattle transport. The most obvious exception to this is the paving of the trans-Canada highway in 1955, which is important. This period was not characterized by significant new building of transport infrastructures, rather, the second half of the century was instead characterized by increases in competition made possible by previous investments in transport infrastructure.

5.1.1 Legislation and Transport Policy

This section proceeds with a discussion of the regulation of railways and highway carriers. In response to persistent squabbling, the government appointed the Turgeon Commission in 1948 to address the long-standing grievances related to the rail freight rate structure.

The Turgeon Commission left behind no legacy, and in fact Darling (1974) has remarked

that less than ten years after the Turgeon Commission reported, all the recommendations were irrelevant.

For historical interest, the major recommendations of the Turgeon Commission were the one-and-one-third rule, the bridge subsidy and the equalization of class and commodity rates. The one-and-one-third rule concerned the short-haul/long-haul discrimination, and decreed that the rate at any intermediate point not exceed the transcontinental rate by more than a third. In response to this rule, the railways essentially discontinued the use of the transcontinental rates, moving all of the traffic over to agreed charges, which had not been affected by the Turgeon Commission.

The bridge subsidy was a subsidy to the "bridge" of track north of Lake Superior that linked eastern and western Canada. The rationale of the subsidy was to finance the unprofitable stretch of track and to help out the railways. Eventually, the bridge subsidy began causing problems for the trucking industry operating north of Lake Superior, and it was discontinued.

The equalization of class and commodity rates was also irrelevant because of the small amounts of traffic that was moving under those rates. Any problems that this equalization could have created for the railways was simply solved by moving the traffic to agreed charges.

Over the next ten years, rate increases occurred in the following pattern, as taken from Darling (1974):

1. The railways sign union agreements calling for extensive wage increases.
2. The railways apply to the board for higher rates to offset these increases in cost.
3. The provinces protest the increases and ask the board to dismiss the application as unnecessary or improper.
4. The board rules that it should hear the application.
5. Protracted hearings ensue during which all the old arguments are brought out by both sides.
6. The board issues a judgement and order awarding the railways something less than the amount applied for.
7. The provinces sometimes appeal, now to the Supreme Court, now to the cabinet, to rescind the board's order.
8. The appeal is heard and rejected, so that many months after the date of the original application the increase is permitted to take effect.
9. In the meantime, a new union contract has been signed by the railways...

In 1957, the government introduced the Freight Rates Reduction Act, a direct subsidy of the railways in exchange for the lowering of rates, or a decrease in the speed of rate inflation. It was obvious that this measure would not last for long.

By 1959, it was apparent that the Turgeon Commission had failed to relieve the political tension related to the freight rate structure. The western provinces were still loudly complaining that the structure of the system inhibited value-added production in the west. A Royal Commission, later called the MacPherson Commission, was appointed in 1959 to examine the recurring problems.

The MacPherson Commission reported their findings in 1961 and ushered in a new era of transportation policy. The findings of the MacPherson Commission were that the railways

should be less regulated because they were no longer in a monopoly position. The Commission recommended the deregulation of the rate-making process, giving the railways more control than they had previously. The steady increase in truck competition had created an atmosphere of competition, and heavy-handed treatment of the railways was no longer needed, according to the Commission.

Many of the recommendations of the MacPherson Commission were incorporated into the National Transportation Act, 1967. This legislation left the railways free to adjust rates, within certain limits. The railways did not have total control. For example, they were not allowed to price below their variable cost. The rates, however, were still in the public domain and any shipper had the right to the same rates as his competitor should he be in a like location with like levels of freight. The Canadian Transport Commission (CTC) was set up to investigate problems relating to freight rates.

The Western Economic Opportunities Conference that was held in Calgary in 1973 was a conference between the western Premiers and the federal government. At the time, freight rate issues were one of the top western concerns. Since this time, there has been a gradual decline in the importance of freight rate complaints, to the point where this is no longer an issue in 1995. At the time of the conference, westerners were bitter that rates that did nothing to encourage value-added production in the west. The Feed Grain Act was still in place, long after the war, allegedly suppressing the growth of the western feedlot and meat packing industries. There were other important cases, such as the

Rapeseed Case, where shippers found that it was much cheaper to ship uncrushed rapeseed than processed seed. These cases made it clear that rail rates were still inhibiting value-added production in the west. This was a concern because value-added production was at this time the fastest growing sector of the agribusiness industry.

The period following the NTA, 1967 has seen the growth of market competitive rates. These rates are given to shippers to enable them to be competitive in export markets. The logic is that if non-competitive rates are given, there will be no traffic for the railway. These competitive rates often created short-haul/long-haul discrimination, although in this era, the cries of protest have been drowned out by other national problems.

Transportation has gradually become a less inflammatory issue (Heads, 1993). The reasons for the decline of transportation as a significant national policy issue include the development of other serious economic problems such as deficits, inflation and unemployment. The increased emphasis on macro-economic issues has led to a decrease in the relative importance of transportation and regional development. The patterns of regional trade have also changed, and the east-west trade that previously characterized Canada is becoming less important. North-South trade corridors have replaced east-west trade as the most significant trading patterns. This movement away from east-west trade has made the issue of east-west freight rates less pivotal. The shifting patterns of trade will be discussed in greater detail in section 5.2, which deals with the cattle industry and markets for cattle.

The WGTA, the descendant of the Crowsnest Pass Agreement, was legislated in 1983. Under the WGTA, the federal government subsidized the shipment of grain by rail, paying over half the freight rate with the residual paid by the producer. This legislation, a source of tremendous controversy, was abolished by the 1995 federal budget.

In 1987, the National Transportation Act, 1987 was assented to, and this act did not contain many cataclysmic changes for rail. In fact, the railways have complained that they did not get much out of the new legislation. The most important freight rate-related change is the implementation of confidential contracts between shippers and the railways. The contract is negotiated between the shipper and carrier, and then filed with the National Transportation Agency. Confidential contracts are not in the public domain, and therefore other shippers rarely have enough information to figure out if they are being treated unfairly. In 1993, approximately 56% of all rail freight now moved under confidential contract.

The regulations affecting the trucking industry have been much less complex than those which affect the rail mode. There have been no regulations affecting the rates charged by trucking firms, the only regulations of economic significance being those set to restrict entry into trucking. Inter-provincial trucking, which is trucking between more than one province, has long been under the jurisdiction of the Canadian Transport Commission. For most of the period, entry into inter-provincial trucking was limited strictly to those who had the necessary operating authorities. For a new firm to acquire an operating

authority, it was necessary to show that it was in the interest of the nation that the firm operate. In 1987, this state of affairs changed with the new Motor Vehicle Transport Act, 1987, which deregulated entry into inter-provincial markets by changing the old "public Convenience and necessity" test into a "reverse onus" test, where it was up to the firms already operating in a market to show that the entry of a new firm would be detrimental to the public good. Finally, in 1992, the "reverse onus" test was transformed into a "fitness" test, where all a prospective carrier needed to do to gain the necessary operating authority was provide information showing that it was "fit and able" to operate a trucking undertaking.

The effect of these changes in trucking legislation was to increase the amount of competition in inter-provincial markets. The result of increased competition has been more volatility in the trucking industry, but it is not the purpose of this study to examine this issue.

In summary, there is a long history of freight rate regulation in Canada. There have been many attempts to fix the rate system over the past century. It is reasonable to think that complaints about the freight rate system have led to faster reforms of transport policy. Over the past 100 years, regional concerns have played a large role in changing the face of the rail rate structure. The greater the protest about rail rate inequities, the more frequent the attempts to fix the system. Naturally, when the protest died down or was drowned out by more pressing problems, there was less pressure to make significant

changes to the rate system. In fact, it could be argued that the rise of a competitive ideology was as significant as any regional concerns in expediting the changes that took place in the NTA, 1987. There were fewer significant changes for rail in the NTA, 1987 because of the lack of pressure to make changes. Regional concerns in the 1980's have been upstaged by national concerns such as unemployment, inflation and deficits. The move towards greater competition in transport also affecting the trucking industry, when in 1987, the Motor Vehicle Transport Act, 1987 was enacted. This act and the further effects of the amendments reduced the restrictions on entry into inter-provincial trucking markets, leading to greater competition.

5.1.2 Rail/Truck Competition Since 1950

The trucking industry has experienced rapid growth since 1950, increasing its radius of competition as well as its share of freight traffic. Numerous technological changes have taken place that benefit the trucking industry, principally in the areas of road and vehicle construction. Trucking equipment has a much shorter lifespan than rail equipment, and trucking firms are able to react very quickly to changes in technology. Highway tractors may only be used for three years before they are replaced with a newer model, while a good deal of railway equipment lasts for 20 years.

Mechanical refrigeration replaced ice-and-salt refrigeration in the 1940s and 50s. The effect of this technological change was greater on the trucking industry because of the faster rate of replacement in that industry. This faster equipment-replacement allows the trucking industry to take advantage of new technologies with greater speed. Furthermore, the cost of refrigerated trailers has decreased over the years due to mass production, while refrigerated rail cars remain more expensive.²

Writing on the development of Canada's transport industry, the MacPherson Commission had this to say:

Since the end of World War II, particularly in the last decade, the application of rapid and continuing improvement in all modes of transport, and the construction of new ones, offered a range of services at a range of costs which inevitably gave rise to more intense competition in the provision of transportation. Vastly improved air services, construction of pipelines, the expansion of the St. Lawrence River system, the tremendous technological improvement in railway equipment and methods, plus the growth of the trucking industry as equipment improved and the highway network spread, has given the nation a range of service which has widened the horizon of choice within which individual business and industries may operate in planning production and supplying markets within Canada and abroad. (MacPherson Commission, 1961: Vol. 2, Page 7)

The growth of trucking cannot be credited solely to the development of stronger roads and better trucks. The natural advantage of trucks is that they offer more personalized service. Trucks can cater to the needs of shippers in a way that railways cannot (at least in the

²From interview with Paul Clegg, Manager - Marketing, Grain Office, CP Rail System, on March 13, 1995.

majority of cases). Trucks can pick-up their load at the customer's doorstep, and drop the load off at the consignee's loading dock. Less handling is involved in truck shipments, and the mode can also offer shippers more frequent trips. Another advantage that the trucking industry has enjoyed is a relatively low tax burden compared to the railways. Highway infrastructure costs (highways, bridges, tunnels) are paid by the state, while the railways must pay these costs themselves. At one time, railways were thought to offer more reliable service because they were rarely stopped by snow, sleet and ice, but these factors are no longer a barrier to trucks because roads are now cleared, at the tax-payers expense.

The flow of traffic in Canada was east-west oriented through much of this period, with the majority of the products moving from the east into western Canada. As a result, western manufacturers received backhaul rates for shipping their products eastward. Although both truckers and railways had a need for backhaul moves, trucks could offer door-to-door service and could also match railway rates for traffic moving eastward.

The reader will recall from chapter four, the statement that in 1950, railways rarely carried goods less than 100 miles. In 1956, the Gordon Commission undertook a study that suggested that the greatest concentration of motor truck activity was between 20 and 600 miles, and a great volume of traffic moved distances up to 1500 miles (Currie, 1967: 484). Table 5.1 reports the modal share of domestic freight ton-miles and tonne-kilometers for several years. The data are quite good for the beginning of the period, but

there is a long lapse in the 1970s and early 80s that is the result of a revolution and restructuring of trucking statistics. The road statistics represent only the for-hire trucking industry, as information on the private trucking industry is very difficult to collect.

	Rail	Road	Water
1952	63	8	29
1956	61	8	31
1960	56	12	32
1964	53	11	36
1968	55	12	33
1990	57	22	21

Source: Purdy, H.L. Transport Competition and Public Policy in Canada (Vancouver, University of British Columbia Press, 1972) and NTA Review Commission, Competition in Transportation (Ottawa, National Transportation Act Review Commission, 1993)

The highway carrier share of domestic freight ton-miles (or later, tonne-kilometres) increased steadily over the period. Tons (and tonnes) carried by the modes shows a slightly different distribution, with highway carriers carrying approximately the same number of total tonnes as the railways, both in the 1950s and the 1990s. This shows that trucks were (and are) more involved with short-haul movements, which count as tons moved (or tonnes moved), but add less to ton-miles performed than long-haul moves.

In summary, the share of domestic freight ton-miles carried by highway carriers increased from 8% in 1952 to 22% in 1990. Reasons for the growth of trucking include more personalized service, efficient and rapid use of new technologies, and low taxes.

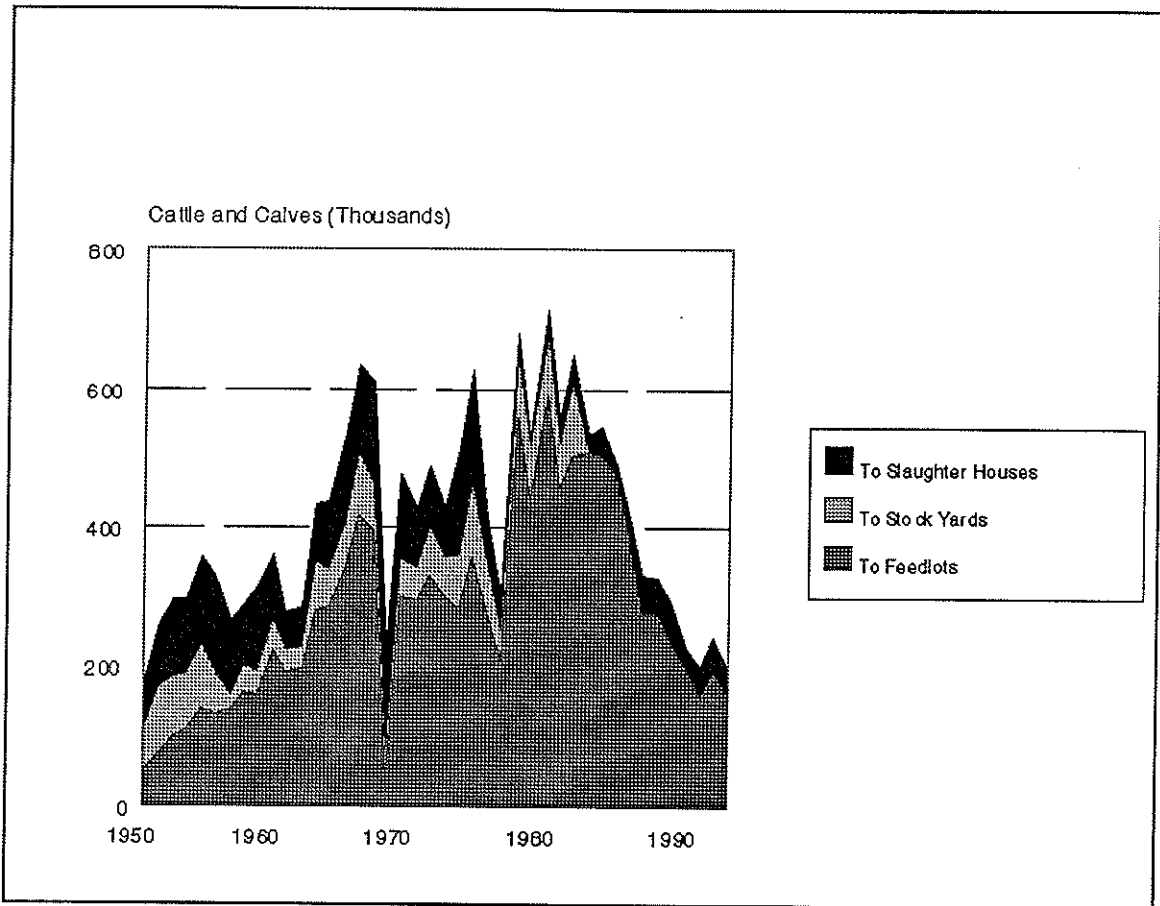
5.1.3 Competition in the Long-Haul (West→East) Cattle Transport

This section examines the numbers of cattle shipped from the western prairies to eastern Canada since 1950, as well as the modal share of that long-haul traffic. Modal share data is unavailable for the bulk of the period, however, it is known that in 1950 almost all cattle shipped from western Canada to the east were shipped by rail. In 1993, no cattle were shipped by rail; all of the remaining traffic having been diverted to trucks.

Somewhere in between 1950 and 1993 there was a restructuring in the method of shipping cattle.

Figure 5.1 shows the numbers of cattle and calves shipped from western to eastern Canada from 1950 to 1993. In addition, the cattle shipped are broken down into three categories: cattle shipped to feedlots, cattle shipped to slaughterhouses and cattle shipped to stockyards. In the later years, the third category, cattle shipped to stockyards, was amalgamated with the other categories because the stockyards are never the final destination for shipped cattle; all cattle shipped to stock yards ended up eventually in either a feedlot or a slaughterhouse.

Figure 5.1: Cattle and Calves Shipped from Western Canada to Eastern Canada, by destination, 1950-93

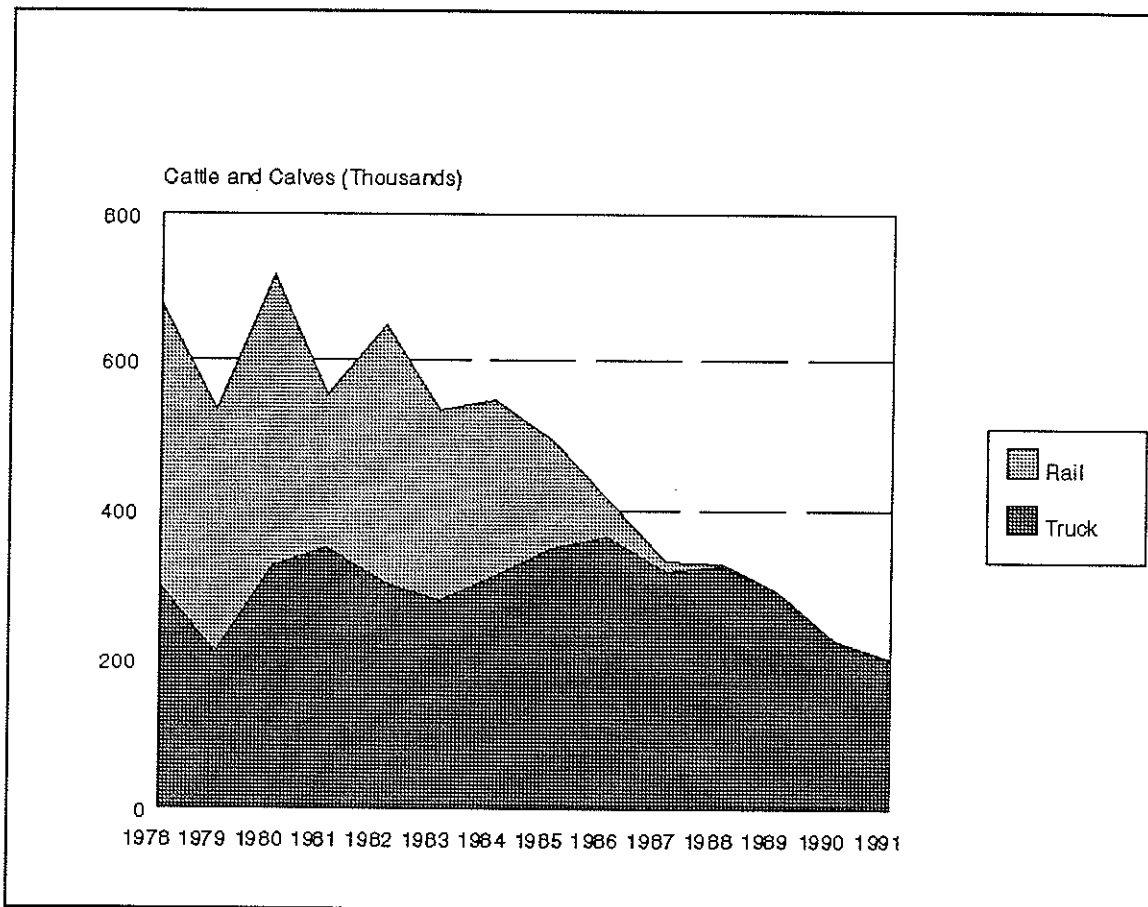


Source: Statistics Canada, Livestock and Animal Products, SC 23-203, 1950-76 and Agriculture Canada, Livestock Market Review, 1950-93.

The cattle being shipped to eastern feedlots expanded significantly during this period while the cattle shipped to slaughterhouses gradually declined. There is no evidence to suggest that a particular mode of transport had an advantage in shipping either feeders or slaughter cattle. The sharp decline in the number of feeder cattle shipped to eastern Canada is the result of the increasing competitiveness of the western Canadian feed lot industry.

As discussed in chapter four, it is believed that almost all west→east cattle were shipped by rail prior to 1950. It is since then that a dramatic shift in logistics of cattle transport took place. Data for precise modal shares do not emerge until 1978, where the numbers of cattle shipped are broken down by mode. By 1988, the modal split was deemed unnecessary because the rail mode's share of this very narrow market had evaporated. Figure 5.2 shows the modal share of west→east cattle movements from 1978 to 1993.

Figure 5.2: Modal Share of West→East Cattle Movements 1978-93



Source: Agriculture Canada, Livestock Market Review, 1950-93.

Rail's share of this long-haul traffic disappeared in the mid-eighties, however the total size of the pie also decreased. Economic theory suggests that this change in market share cannot be solely attributed to rate-cutting by the trucking industry, because if the change was the result of lower rates, the total amount of traffic would have increased, *ceteris paribus*. The total amount of traffic actually decreased, so there must be other forces at work in this case.

There is little information about the modal shares before 1978. It is unlikely that truck competition in this market emerged in 1978 with close to half the market share.

Presumably, truck competition started before 1978, and gradually became more prominent. However, this data is unavailable.

It has been suggested that the railways were happy to get out of the cattle transport business because hauling cattle was not profitable.³ There were no backhaul opportunities for cattle cars returning from eastern Canada to the west. As a result, these cars returned empty, contributing nothing to the fixed costs. Cattle trailers, on the other hand, often had collapsible sides and could be turned into flatbeds for the return trip. As a result, trucks had more backhaul opportunities, which is one of the reasons why they were able to make profit in a market that was unprofitable for the railways.

³Interview with Gordon Seddon, former employee, CP Rail System on March 14, 1995.

The rates charged by the railway had to cover the entire cost of the trip, while trucks were able to haul loads in both directions, making revenue on each leg. As a result, the trucking industry was able to meet and undercut rail rates. Rates were depressed to the point where these movements of cattle were not profitable for the railways.

In 1968, the Union Stock Yards, an important infrastructural component of the railway cattle transport industry, was in financial trouble because of reduced numbers of cattle being shipped through the yards. The Union Stock Yards underwent significant new investment in an attempt to reverse the trend and boost employment.⁴ This attempt to reverse a disturbing trend is circumstantial evidence that trucking was beginning to take a bite out of rail's market share as early as the mid-sixties, as volumes shipped had not yet begun to decline.

While livestock and meat were only a very small part of railway car loadings, the two commodities were very important truck commodities originating in western Canada. Table 5.2 shows a breakdown of the total tonnes carried by trucks from the west to eastern and central Canada for three years, and the percentage of those tonnes that were meat and meat products. The distinction between eastern Canada and central Canada made in this table has been applied differently throughout this study; in this case, central Canada includes Ontario and Quebec, while eastern Canada includes the Atlantic provinces. No significant amounts of livestock were shipped from western Canada to

⁴Union Stock Yard Archives, University of Manitoba.

Atlantic Canada. It is very important to remember that the Total Tonnes Shipped category considered in table 5.2 refers to all goods shipped. Thus, the %Meat and %Livestock categories refer to the percentage of total tonnes shipped that was meat or livestock.

	West→East		West→Central		
	Total Tonnes Shipped	%Meat	Total Tonnes Shipped	%Meat	%Livestock
1985	34,031	20.0	1,274,324	11.2	5.8
1988	57,216	13.5	1,697,744	9.6	6.7
1990	40,337	14.2	1,310,793	13.2	9.9

Source: Statistics Canada, Trucking in Canada, SC 53-222, 1985, 1988, 1990

This table shows that meat (and livestock) are important commodities for the trucking industry in western Canada. This is further supported by the export data presented in section 5.2.3. In all of the years shown in Table 5.2, meat and meat products was the number one commodity (in terms of tonnage) being trucked out of the western provinces to the east and to central Canada. Livestock was often the fourth or fifth largest commodity being shipped from western to central Canada. No significant amounts of meat or livestock were trucked from the other provinces into the west. The most

important goods trucked from central Canada to the western provinces were general goods (unclassified), and iron & steel alloys.

In summary, the numbers of cattle shipped west→east increased, fluctuating rapidly until the early 1980s. The increases in cattle shipped were primarily composed of feed cattle. The rail share of the west→east transport market went from 50% in the late 70s to 0% in the mid-80s. Rate-cutting by the trucking industry cannot completely explain this phenomenon because the total number of cattle shipped decreased rapidly as rail was edged out. The trucking industry was able to make profits in the long-haul cattle transport industry because of the available backhaul opportunities. Cattle hauled by truck to eastern Canada were moved on backhaul rates while cattle shipped eastward on the rails were fronthaul traffic for the railways.

5.2 Developments in the Cattle and Beef Industries Since 1950

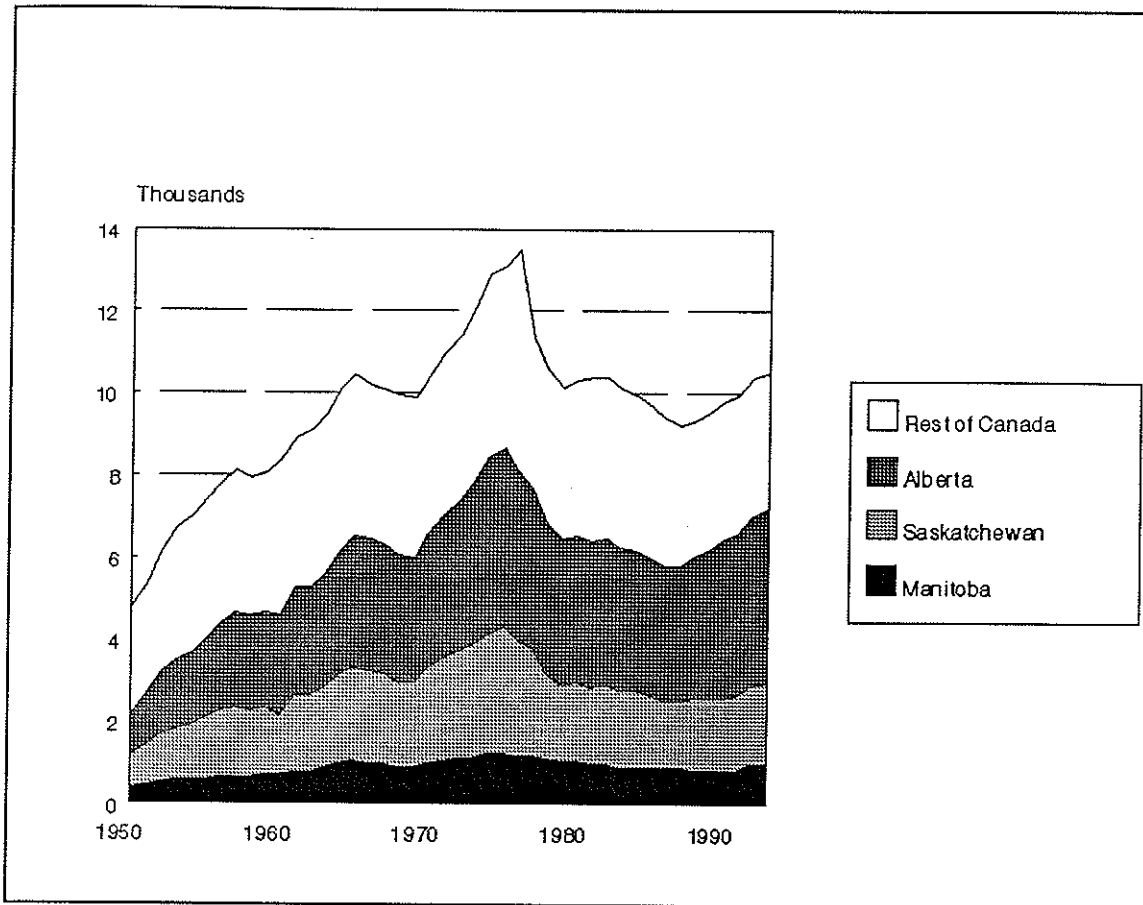
This section contains four sub-sections. The first sub-section, 5.2.1 examines the changes in the location of the cattle supply and slaughtering activity. Section 5.2.2 summarizes cattle prices at several centres, and section 5.2.3 looks at domestic and export markets for cattle and beef. Section 5.2.4 examines economies of scale in the cattle processing industry.

5.2.1 Location of Cattle Supply and Slaughtering Activity Since 1950

Since 1950, there have been several significant developments in the location of the cattle supply and slaughtering activity. The largest change has been the increase of the Albertan share of the cattle supply and slaughtering activity. Alberta's share of the cattle supply increased from 20.8% in 1950 to 39.0% in 1990. In slaughtering, Alberta's share of the national cattle slaughter increased dramatically from 11.6% in 1950 to 45.0% in 1990. These shifts are partly due to changes in transportation technology, partly due to changes in the location of markets for beef and beef products, and partly due to the competitive position of the Albertan feed lot industry.

Figure 5.3 shows the number of non-milk cattle in Canada and the prairie provinces since 1950. The total number of non-milk cattle increased over the period, showing dramatic growth until the mid-1970s, then decreasing sharply until the late-80s, and finally rebounding until the present day.

Figure 5.3: Number of Non-Milk Cattle in Canada and Prairie Provinces Since 1950

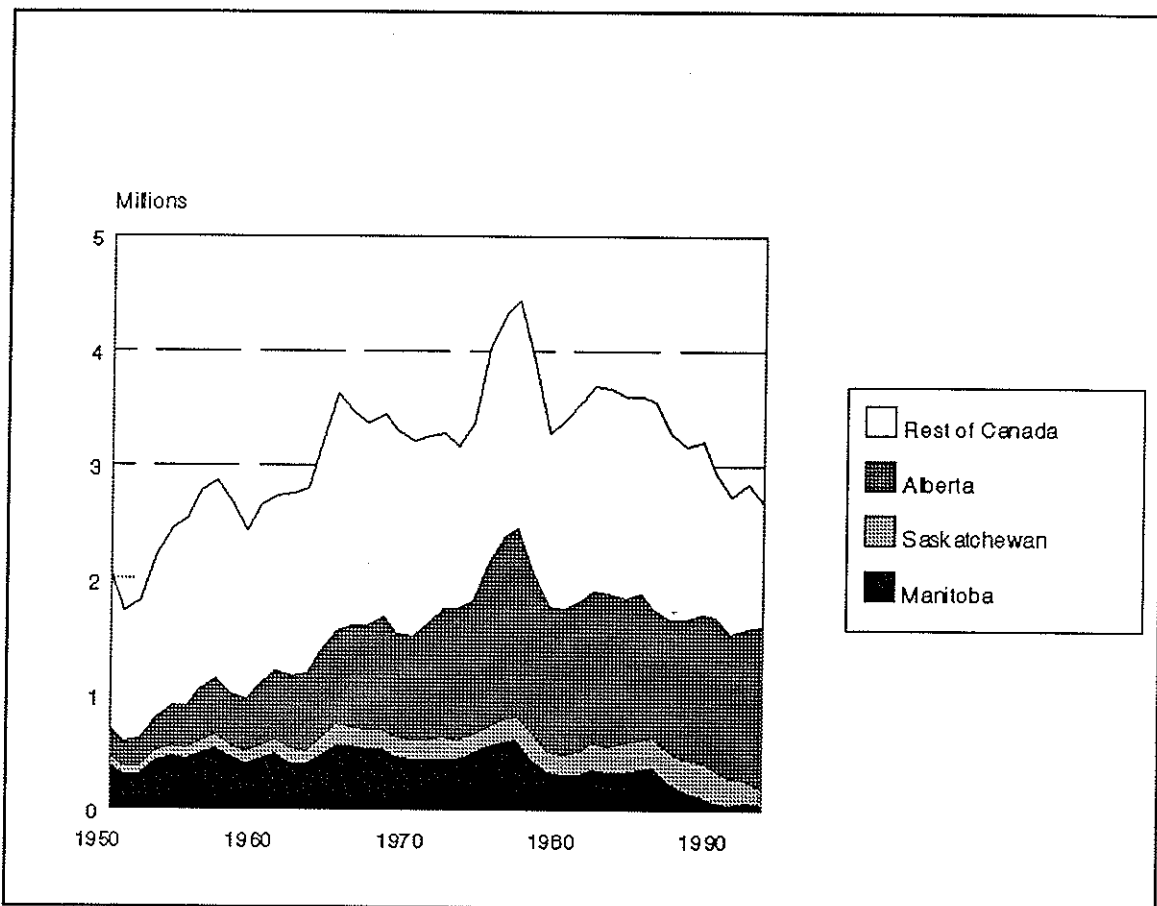


Source: Statistics Canada, Livestock and Animal Products Statistics, SC 23-203, 1950-76, and Agriculture Canada, Livestock Market Review, 1950-93

The number of non-milk cattle in Manitoba grew slowly until the mid-70s, after which time the Manitoban cattle population levelled off. In Saskatchewan, the cattle supply expanded fairly rapidly until the mid-70s, after which it decreased slightly and then levelled off for the remainder of the period. The Albertan cattle supply experienced strong growth throughout the period. However, the provincial stocks suffered slightly from the sharp downturn in the late 70s that affected the other provinces.

The numbers of cattle slaughtered in federally inspected establishments in Canada and the provinces is shown below in Figure 5.4. In Canada, the number of cattle slaughtered increased slightly over the period, first increasing until the late 70s, and then decreasing steadily thereafter. In the end, the number of cattle slaughtered in 1993 was up approximately 600,000 head from the number slaughtered in 1950.

Figure 5.4: Cattle Slaughtered at Inspected Establishments Since 1950



Source: Statistics Canada, Livestock and Animal Products Statistics, SC 23-203, 1950-76 and Agriculture Canada, Livestock Market Review, 1950-93

In Manitoba, the number of cattle slaughtered remained relatively constant until the mid-70s, despite the fact that the number slaughtered was increasing for the country as a whole. From the mid-70s on, the Manitoban slaughter was squeezed out, to the point where it represented approximately 2.8% of the total slaughter in 1993. In Saskatchewan, the number of cattle slaughtered experienced slow growth throughout the period, increasing its share from 4.6% in 1950 to 9.3% in 1990. The largest increase was seen in Alberta, where the number of cattle and share of the total slaughter increased consistently throughout the period.

There have been important changes in the provincial shares of the cattle supply and slaughtering activity since 1950. Table 5.3 shows the percentage of the national totals of these series that can be attributed to each prairie province for the period, 1950-1990 at ten year intervals.

	Manitoba		Saskatchewan		Alberta		Canada	
	% of cattle	% of slaughter	% of cattle	% of slaughter	% of cattle	% of slaughter	% of cattle	% of slaughter
1950	8.0	18.3	15.7	4.6	20.8	11.6	100.0	100.0
1960	8.7	17.1	17.0	4.4	28.9	19.5	100.0	100.0
1970	9.6	14.0	21.9	4.9	31.6	28.6	100.0	100.0
1980	9.9	9.2	18.9	5.4	34.2	39.9	100.0	100.0
1990	8.6	2.8	17.8	9.3	39.0	45.0	100.0	100.0

Source: Statistics Canada, Livestock and Animal Products Statistics, SC 23-203, 1950-80, and Statistics Canada, Livestock Statistics, 23-603E, 1993

In the 1950s, Manitoba was a net importer of cattle. The province performed slaughter on its own cattle, as well as large quantities of cattle raised in Alberta and Saskatchewan.

By 1990, the tables were turned, and Alberta slaughtered more than its share of the cattle supply. In 1990, Alberta was actually a net importer of cattle, bringing cattle in from the other prairie provinces as well as from the U.S. in some cases. This was possible because the Albertan feed lots enjoyed a strong competitive position, a point that will be discussed in section 5.2.4. Manitoba's cattle slaughtering activity was negligible in 1990, suffering a great fall from the lofty position it enjoyed in the middle part of the century.

Part of the reason for Manitoba's fall in slaughtering activity was the decline in the numbers of cattle being shipped east from the prairies, as shown in section 5.1.3. In previous years, with many cattle funnelling through Winnipeg to the east, it was

convenient and profitable to perform the slaughter at the point of gathering - Winnipeg - because the production was weight-losing. Entrepreneurs in Winnipeg were able to take advantage of that city's role as a trans-shipment point. However, as the number of cattle funnelling through Winnipeg became smaller, the local industry died. Packers in Alberta began to take advantage of the fact that there was increased trade with the U.S. (as will be seen in 5.2.3), and the fact that they sat upon the largest source of cattle in the country.

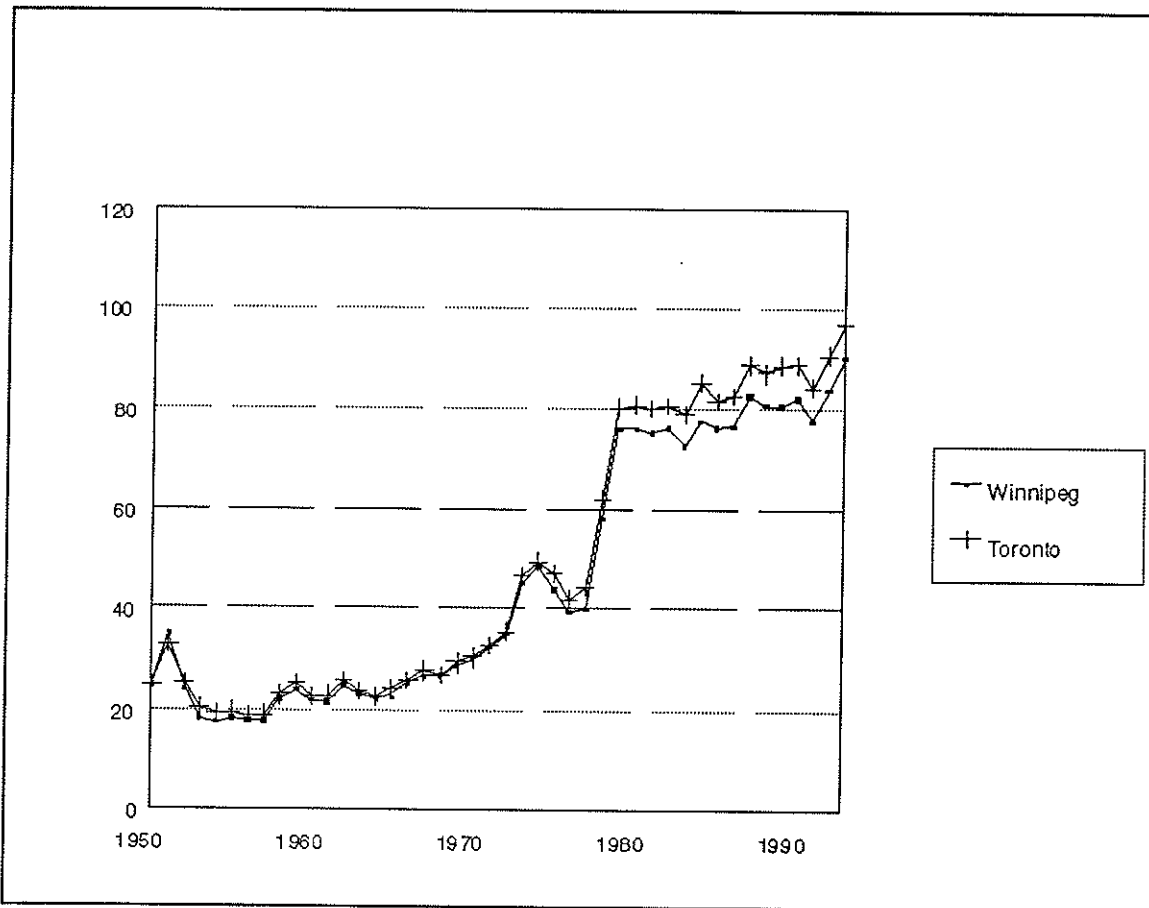
In summary, the numbers of non-milk cattle and cattle slaughtered have followed a bumpy, upward-sloping path since 1950. Manitoba's share of the national slaughter plummeted, while Alberta now undertakes close to half of the nation's slaughtering.

5.2.3 Cattle Prices Since 1950

Cattle prices have continued to follow an upward pattern since 1950, however, the relation between the prices at different centres has not retained the stability that it showed during the first half of the century. In the first half of the century, the prices for livestock in major centres were like a staircase - they were determined by their proximity to the eastern market. The lowest step was Edmonton, the next step was Calgary with slightly higher prices, then Saskatoon, which had higher prices than Calgary, and then Winnipeg with higher prices than Saskatoon. All of the prices in western Canada were lower than those in eastern Canada.

For the record, Figure 5.5 shows the price per cwt for A1, 2 steers of over 1000 lbs in both Winnipeg and Toronto. The prices for A1 and A2 steers are roughly equivalent to the price series quoted in chapter four. The "good" steer prices examined in that chapter are equivalent to the prices of A2 steers. A1 steers are the modern equivalent of the cattle that were known as "choice" steers many years ago.

Figure 5.5: Prices of A1, 2 Steers in Winnipeg and Toronto Since 1950, \$ per cwt



Source: Statistics Canada, Livestock and Animal Products Statistics, SC 23-203, 1950-76 and Agriculture Canada, Livestock Market Review, 1950-93

Prices of A1, 2 steers increased gradually through most of the period, increasing sharply in the mid-70s and then levelling off. This sharp increase can easily be explained by the changes in the cattle supply and in the number of cattle slaughtered. Table 5.4 shows the average annual prices for A1, 2 steers for Toronto, Winnipeg, Calgary and Edmonton. The prices quoted are the market prices at public stockyards.

It appears that the margin between Toronto and Winnipeg increased by a large amount after about 1980. This effect is not as pronounced as one might think - in percentage terms, Winnipeg oscillated between 90-99% of the Toronto price before 1980, and the same range was also evident after 1980. In percentage terms, there appears to be little difference in the relation between Toronto and Winnipeg prices before 1980 and after 1980. If there were a widening margin, it would not be surprising because Winnipeg was caught in between the sphere of influence of the Toronto market, and the rising Calgary market.

Table 5.4: Prices for A1, 2 Steers in Toronto, Winnipeg, Calgary & Edmonton, \$ per cwt				
	Toronto	Winnipeg	Calgary	Edmonton
1950	24.74	24.55	24.40	24.30
1955	19.60	18.45	18.20	17.85
1960	22.65	21.70	20.65	20.46
1965	24.00	23.25	22.65	22.15
1970	30.40	30.20	28.90	29.20
1975	46.99	43.80	43.56	41.31
1980	80.74	76.06	74.59	74.54
1985	81.63	76.34	74.18	72.79
1990	88.89	82.33	83.54	81.15

Source: Agriculture Canada, Livestock Market Review, 1950-90

Table 5.4 illustrates the declining importance of Winnipeg as a cattle centre. While in the first half of the century (and much of the second half), cattle prices followed the staircase pattern, in recent years this pattern has been unstable. Recently, the prices in Calgary have exceeded the prices in Winnipeg. Under the older system where the principal market for cattle and cattle products was in Toronto and Montreal, the prices of cattle on the prairies reflected the cost of moving cattle to the large eastern market. Thus, the cattle prices in Winnipeg were expected to be greater than the prices in Calgary for the simple reason that it was cheaper to ship cattle from Winnipeg to Toronto than from Calgary to Toronto. Today the dominance of Toronto and Montreal as the primary market for cattle and meat products has changed. Although the prices in Toronto are higher than the prices

in the west, eastern Canada no longer has the power to determine the cattle prices on the prairies. The primary reason for this phenomenon is that new markets for beef and beef products have been opened up for the producers in Alberta, decreasing their reliance on eastern Canada as the consumer of cattle and cattle products. These new markets are located in western Canada, the south-western U.S., Mexico and the Pacific Rim.

In summary, cattle prices have followed an upward trend since 1950, although the eastern Canadian prices no longer dominate and determine prices in the west. Consistent with southern Alberta's rise as a cattle slaughtering giant, prices in Calgary are no longer set in relation to their proximity to Toronto.

5.2.3 Domestic and International Markets for Cattle and Beef

International trade of cattle and beef has increased since 1950. Interprovincial trade in cattle has changed dramatically from patterns seen in 1950. In 1950, Manitoba was a large importer of live cattle, and an exporter of beef. The live cattle imported into Manitoba originated in Saskatchewan and Alberta, which were both net exporters of cattle, and only involved in beef production on a small scale to meet local demands. In Manitoba, the beef packing industry was on a scale that produced great surpluses of beef over what was consumed locally.

Table 5.5: Provincial and National Net Exports of Cattle, 1977-93, '000 head				
	Manitoba	Saskatchewan	Alberta	Canada
1977	48.6	685.4	30.0	334.8
1978	122.5	649.5	65.2	412.8
1979	106.1	493.9	-9.3	-46.4
1980	142.1	607.7	23.4	331.6
1981	85.6	455.6	-52.3	260.8
1982	186.6	477.5	44.9	418.5
1983	120.0	392.8	-46.5	293.2
1984	135.6	486.2	-21.6	359.3
1985	139.1	421.7	38.9	323.6
1986	115.2	311.4	-30.3	176.6
1987	206.8	279.8	-177.3	192.1
1988	270.4	328.7	-61.2	470.9
1989	255.4	330.9	-161.9	458.1
1990	289	446.5	-51.4	870.1
1991	259.6	426.2	-4.0	886.9
1992	317.0	598.3	48.6	1270.8
1993	352.7	624.7	-31.5	1174.8

Source: Statistics Canada, Livestock Statistics, SC 23-603E, 1993

Data for the inter-provincial and international shipments of cattle by province of origin are difficult to obtain for some years during this period. Table 5.5 shows the provincial net exports of cattle for the prairies, and the net exports of cattle for Canada as a whole since 1977. It is important to keep in mind that provincial net exports include interprovincial

movements as well as international ones, while for Canada as a whole, only international movements are seen.

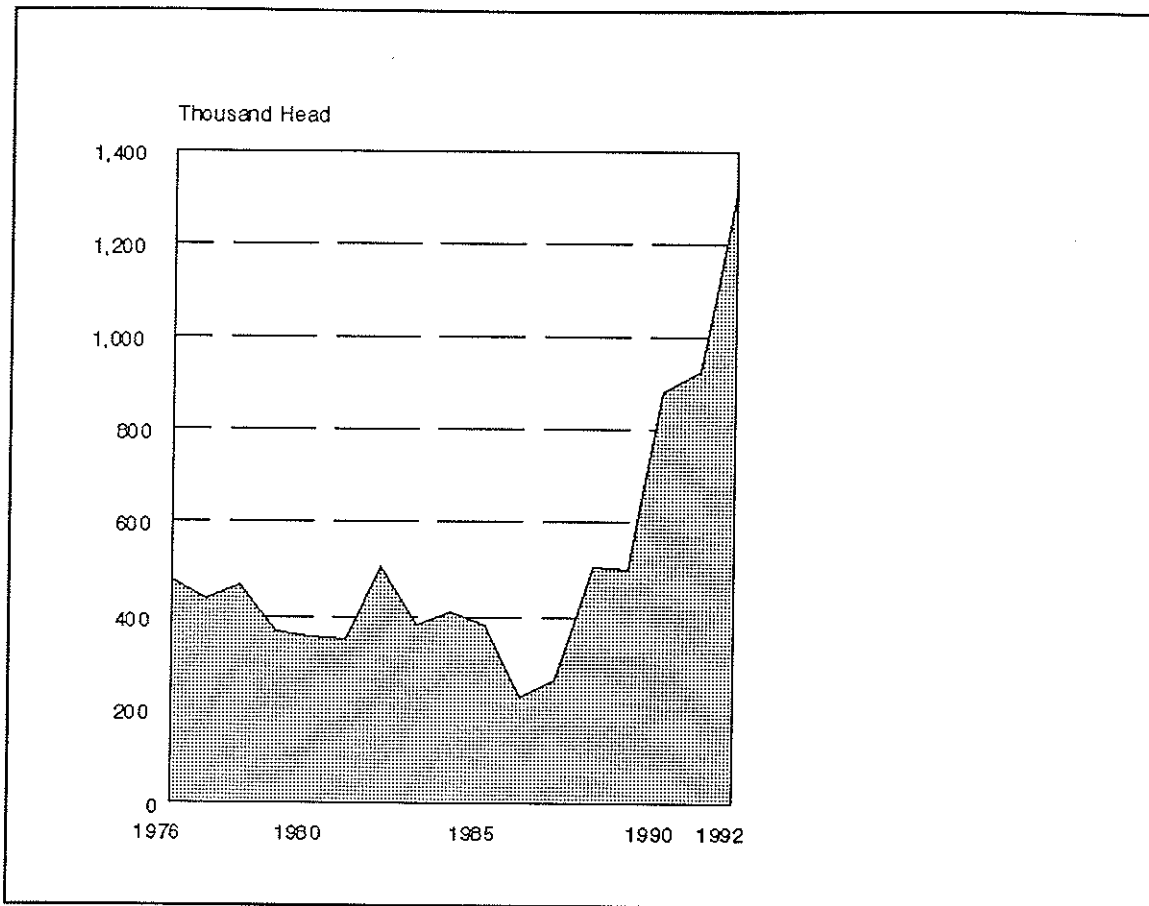
The most important point about this table is that Alberta has become a net importer of cattle. From a position of large net exports in the late 1940s, Alberta has undergone large changes in net exports. Cattle imported into Alberta are often feeders that are fed and then slaughtered, and then exported as meat. It is the increased competitiveness of the Albertan feed lot industry that has attracted cattle and calves into the province for finishing. The competitiveness of the Albertan feed lot industry has been increased by government efforts to improve the irrigation system, resulting in increased production of feed grains within the province. Also, the paying of the "crow off-set" starting in the late-80s, a subsidy to feedlot operators to off-set the effect of the WGTA freight assistance has increased the feed supply. The increased supply of feed grains in Alberta has made feedlot operations profitable.

The amount of cattle imported and exported has fluctuated, but for the last 15 years, Alberta has generally imported more than it has exported. This pull of cattle towards Alberta in recent years explains the decreases in the number of cattle shipped eastward.

Manitoba, which was once a great importer of live cattle has performed an about-face, and is now exporting (mostly to Alberta) a large part of its cattle supply. Today, the number of cattle shipped out of Manitoba far exceeds the numbers slaughtered within the

province. Saskatchewan has remained a large net exporter of cattle, as it has always been. Canada is still, as it has always been (except for one or two anomalies), a net exporter of cattle.

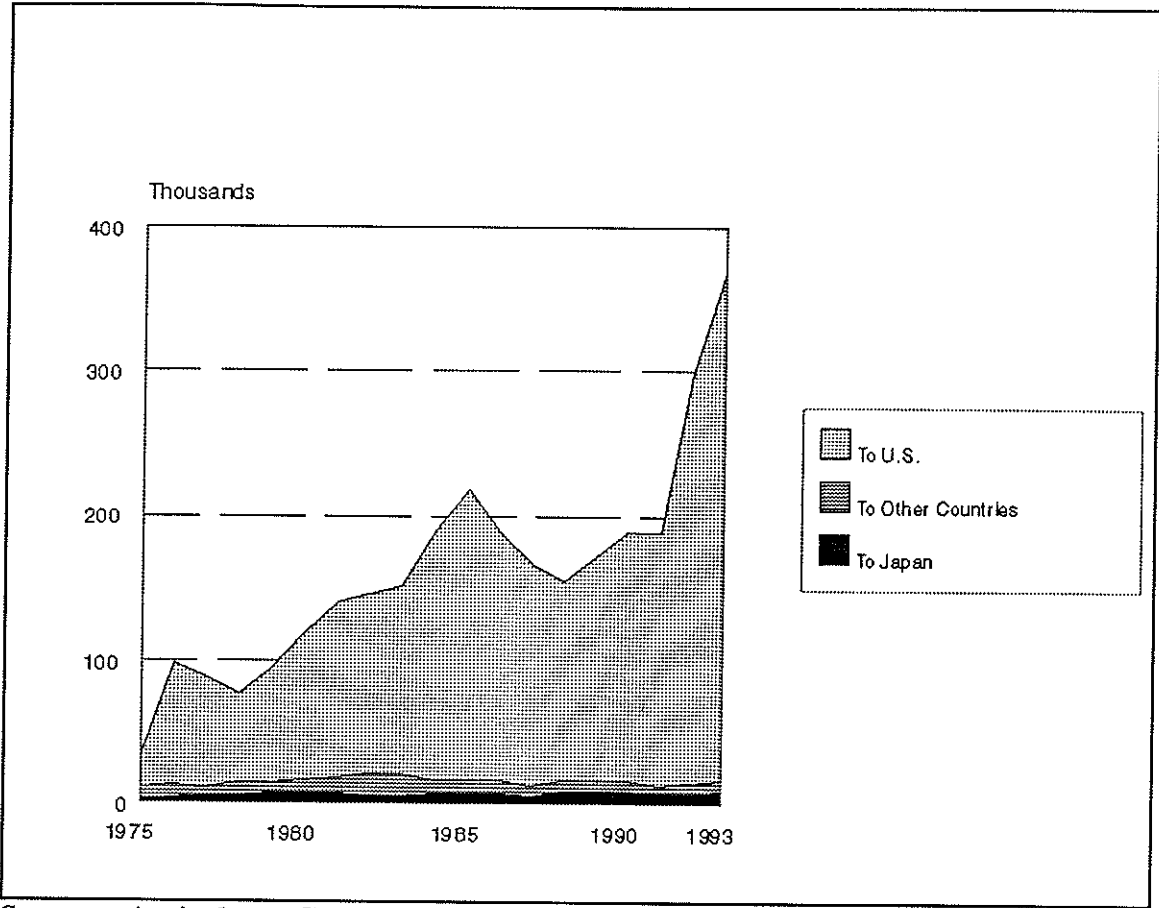
Figure 5.6: Exports of Live Cattle to the U.S., 1976-1992



Source: Agriculture Canada, Livestock Market Review, 1950-93

Figure 5.6 shows that there has been an increase in the number of live cattle exported to the U.S. over the last few years. Most of the exported cattle originate on the prairies. All three prairie provinces export cattle to the U.S., while Alberta also imports cattle from the south. Manitoba and Saskatchewan do not import cattle from the United States. Most of these exports were destined for south and western U.S.

Figure 5.7: Beef Exported to the U.S., Japan and Other Countries



Source: Agriculture Canada, Livestock Market Review, 1950-93

While the numbers of live cattle exported to the U.S. have fluctuated widely over the last 45 years, the exports of beef and beef offal have shown strong increases, especially over the last 20 years. This increase in exports of beef to the U.S. is a good example of the changes in trade flows that have occurred in the last two decades that have had a great impact on the Canadian cattle and beef industries.

Larger exports of beef have come almost exclusively from the beef surpluses produced in Alberta. Much of the surplus beef moves interprovincially, but increasing amounts have

been shipped to the United States. The effects of weakening tariffs and increasing global trade can easily be seen in figure 5.7, which shows skyrocketing beef exports to the U.S.

Comparing the two recent years, 1983 and 1993, there is a strong movement towards more exports to the U.S., Mexico and the Pacific Rim. In 1983, beef exports went 92.8% to the U.S., 3.9% to Japan, and 1.9% to the U.K. In 1993, 98.2% of beef exports went to the U.S., and 1.1% went to Japan.⁵ A glance at figure 5.8 will show that the total amount of beef exports increased by a considerable amount. Total beef exports to Japan remained relatively constant - a much larger effect is noticeable in the exports of beef offal.

In 1983, 65.6% of the exports of beef offal went to the U.K., 16.4% to the U.S., 4.2% to Trinidad-Tobago, and 3.2% to Japan. A strong tendency towards the U.S.-Pacific Rim exports can be seen by comparing the 1983 export destinations to the figures for 1993. In 1993, 55.9% of beef offal exports went to the U.S., 23.6% went to Japan, 8.4% went to Mexico, and 12.1% went to other countries.⁶ This simple analysis shows that in the last decade more Canadian beef exports have entered the U.S., Mexico and the Pacific Rim. The western provinces (particularly Alberta, due to its large cattle supply) are well-placed for exports to the western U.S., Mexico and Pacific Rim countries.

⁵Source: Exports - Merchandise Trade, Statistics Canada SC 65-202, Ottawa, 1973, 1983, 1993

⁶Ibid.

The increased trade with the United States has been the result of a larger trend towards globalization. The Canadian-U.S. Free Trade Agreement has played a role in increasing the amount of trade, as has the deregulation of the U.S. trucking industry in the early 1980s. This deregulation gave Canadian carriers access to all U.S. states, increasing the trade opportunities for Canadian shippers.

In summary, since 1950, Manitoba has gone from being a net cattle importer to a net cattle exporter, while Alberta has become a net importer. Exports of cattle to the U.S. have increased, but exports of beef have skyrocketed. In addition, the markets for cattle and beef have changed from an eastward orientation (aiming at destinations such as the U.K.) to a more westward orientation (aiming at destinations such as Japan, Mexico and the western U.S.).

5.2.4 Economies of Scale in the Cattle Processing Industry

Technology in the meat processing industry has undergone significant changes over the last century. No data on the significance of economies of scale is available before the 1950s. Since the 1950s, there have been technological improvements that have increased the benefits of size.

Eastman and Skykolt (1967) have reported that in 1959 there were very few benefits to increasing plant size over 800 head/week, or 41,600 head/year. Cost reductions for any increases over this plant size were found to be negligible. As a result, any firm with a plant of this size was competitive in the beef market. The plants of the 1950s were based on the gravity system. Plants in this era had a vertical orientation - cattle were driven up ramps to the top floor of the plant, where they were slaughtered. After slaughter, gravity was used to move the animal down to lower floors where other functions were performed.

Ward (1988) reported that there are now significant economies of scale available to the cattle processing industry. Table 5.6 shows the average cost per head slaughtered by plant size for 1985.

Plant Size		Average Cost
Head/hour	Head/year	\$U.S./head
25	52,000	40.71
85	176,800	32.58
145	301,800	29.17
205	426,400	25.54
265	551,200	23.96
325	676,000	22.20

Source: Ward, C.E. (1988) "Meatpacking Competition and Pricing", Research Institute on Livestock Pricing, Blacksburg, Virginia, 1988.

The data show that the cost/head decreases substantially past the level of 52,000 head per year. In 1959, 52,000 head/year would have been quite competitive. Ward (1988) indicates that there appear to be decreases in cost for expanding production to 1,100,000 head/year. Modern plants have a more horizontal orientation - they are flat. Cattle enter the plant at one end and are moved on conveyer belts through different stages of processing.

The changes in technology have made the older plants obsolete. As plants become obsolete, they are generally replaced, but it does not follow that a new plant is built on the site of the obsolete plant. New plants are not tied to specific places, they are built in the most economic location. The changes in processing technology have acted as a catalyst for changes in the location of the cattle processing industry. Since 1950, as old plants became obsolete, they were replaced by new plants in Alberta, which was the most economic location. In Winnipeg, there are several old vertical-style processing plants that are no longer in use. These plants have not been replaced by newer plants in Winnipeg. Instead, people in Winnipeg now consume beef that was produced in new Albertan plants.

5.3 Summary and Conclusions

1. Competition in the transport industry has increased as the motor truck has evolved. This competition has affected both the shipments of meat and cattle originating in

western Canada. In particular, competition from trucks made the cattle shipping business unprofitable for the railways. A significant reason for the strong competitive position of the trucking industry was the availability of backhauls in a market where the railways had none.

2. The number of cattle being shipped eastward increased until the late 70s, and has decreased since. In the late 70s the railways held approximately 50% of this transport market, but by 1988, only highway carriers were moving this freight.
3. Meat and meat products are the largest commodity (in tonnage) trucked out of western Canada to the other provinces.
4. The locus of beef production has shifted to Alberta, the largest source of cattle. Manitoba (once a net cattle importer) and Saskatchewan both export cattle to Alberta for slaughtering and feeding. The strength of the Albertan feed lot industry can take much of the credit for this fact. The structure of Canadian cattle prices also reflect the shift of production to Alberta. Changes in the technology of beef production have acted as a catalyst for this shift in location.
5. Important new markets for cattle and beef have emerged in the western U.S., Mexico and the Pacific Rim (mostly Japan). While before the main market for

Albertan cattle and cattle products was in eastern Canada, globalization and liberalizing trade have changed the principal markets.

CHAPTER SIX: SUMMARY AND CONCLUSIONS

This chapter summarizes the analysis of the previous chapters and suggests some areas for further research. Section 6.1 summarizes the principal findings of chapters three, four and five, and compares these results to the requirements set out in chapter two. Section 6.2 looks at areas for further research.

6.1 Conclusions

It is the thesis of this study that after western Canada was able to produce more cattle than it needed, high railway rates on meat and lower rates on cattle encouraged the shipment of cattle to the east for processing. The prairies were a surplus producer of cattle by the turn of the century. Later, competition from trucks forced competitive freight rates, and this led to increased beef production near the source of the raw materials, in the west. The competition from trucks began in the 1930s, and increased gradually until the 1950s, when it took off. The competitive position of the trucking

industry was increased because of the substantial backhaul opportunities available to that industry compared to the railways.

In chapter two, a locational model with one source of raw materials, and a single different place of final consumption was examined. It was shown that the optimal plant location is at the source of the raw materials if the production process is weight-losing in nature.

Cattle processing is a weight-losing undertaking because the weight of the useable products and by-products is less than the weight of the live animal.

The conclusions of this model are complicated if differential freight rates - different rates for raw materials and finished goods - are introduced. If the freight rate charged on final goods exceeds the rate charged on raw materials, this will tend to move the optimal location of processing towards the place of final consumption. A transport firm in a monopolistic or oligopolistic market will use its market power to extract higher freight rates from some customers - principally the customers that ship high-value goods, such as household goods and meats. However, if competition is introduced into the transport industry, the firm that was previously able to exercise market power will lose that ability, (to some extent) and freight rates will approach the true cost of moving goods.

The availability of backhauled is another important transport-related factor. If a carrier can secure a load for the return trip, it will have an advantage over a carrier that can only carry traffic in one direction.

This framework was used to analyze the shifting locus of beef production, because the Canadian cattle processing industry is believed to conform to the most important assumptions of the model:

- The flow of trade in Canada has been primarily linear (east-west and west-east).
- The western prairies, particularly Alberta have been the source of most of the nation's cattle, while the principal market for the final good (beef) is in eastern Canada, where the largest number of people reside.
- Initially, the railways charged differential rates on meat and livestock, but the transport market became hotly contested as the trucking industry developed.

It is the purpose of this study to examine the history of the west-east cattle transport industry, and its relation to the location of beef production. Information on the following topics was included in the analysis:

- Location of the cattle supply
- Location of the cattle slaughtering
- Location of the markets for cattle and beef
- Rates charged to shipments of cattle and beef
- Competition in the transport industry

- Cattle and meat shipped from western Canada to eastern Canada

The cattle industry in western Canada developed in the last quarter of the 19th century, growing at a fast rate due to the natural advantages of the prairies, and particularly in southern Alberta. This growth continued into the 20th century, as the numbers of cattle in western Canada increased, as did the western share of the total Canadian supply. The growth of Alberta's cattle supply became more rapid than the growth rates in the other prairie provinces. By 1993, close to half the cattle in Canada were raised in Alberta.

Initially, western cattle were raised to be shipped to eastern Canada, as the western population base was very small, and consumed only small amounts of beef. In the 20th century, the prairies began to expand their processing activities, led by Manitoba, which used its advantage as a trans-shipment point to perform weight-reducing slaughter on cattle being shipped towards eastern Canada. Eastern Canada retained its position as the principal location of slaughter through the first half of the century. The second half of the century saw Alberta rise as the nation's largest location of slaughter. Manitoba lost its position of importance, and actually began to ship its own cattle to Alberta for slaughter. Alberta's dominance is now so great that it is a net importer of cattle.

In the 19th century, the only method of shipping cattle from western Canada to the east was on the C.P.R., Canada's first transcontinental railway. In the beginning of the 20th

century, two new trans-continental railways appeared, although they do not appear to have introduced significant competition into the transport market, preferring to practice value-of-service pricing like the C.P.R. The railways followed the class rate system, which charged higher rates to finished goods such as meat, and lower rates to raw materials, such as cattle. In the 1930s, trucks emerged and began to compete with the railways for short-haul traffic. However, the trucking industry did not really begin to divert cross-Canada cattle shipments until the second half of the century, when the growth of the industry really took off. The competitive position of the trucking industry was bolstered by the availability of backhauls. Due to equipment inflexibility, the railways could not move backhaul traffic in their cattle cars, while the trucking industry was able to do so. The availability of truck backhauls enabled the trucking industry to give shippers very low rates - soon the railways found it difficult to turn a profit in the cattle transport industry. In the late 1970s, the railways still had a 50 percent share in the west→east cattle transport market, but ten years later, trucks completely dominated the market, and the number of cattle shipped west→east had declined significantly.

In the 19th century, cattle that were not shipped to eastern Canada for slaughter was often shipped to the United Kingdom, via eastern Canada. Cattle exporting became a large industry in western Canada. All of the markets for western cattle lay to the east, either in Ontario and Quebec, or the U.K and eastern U.S. This trend continued for much of the twentieth century. In the last quarter of the 20th century the markets for beef and cattle began to expand in the western U.S., Mexico and the Pacific Rim. Trade with these

regions increased, as established east-west Canadian trade patterns changed into new north-south flows. The changing patterns of trade from the traditional east-west flows to north-south flows are the principal reason for the decrease in the number of cattle shipped from western to eastern Canada.

Two important points arise from the history of the Canadian cattle and transport industries:

1. When competition in the transport industry was very weak, most of the processing of cattle took place in eastern Canada, or in export markets such as the U.K. or U.S. As competition increased, the locus of production gradually moved westward, towards the source of supply, first to Manitoba, and finally to Alberta.
2. Several other factors that have influenced the spatial development of the cattle processing industry have emerged. In Canada, the patterns of trade have shifted from a east-west orientation to a broader north-south pattern, with significant ties to Mexico and the Pacific Rim. Alberta, a great source of surplus cattle, is closer to these new markets than is eastern Canada. The increased competitiveness of the Alberta feedlot industry has reduced the number of feeders leaving the province, and increased the number of cattle slaughtered there. There have also been shifts in the western Canadian population - at one time, the bulk of the western population was in Saskatchewan and Manitoba, but over the last century, there has

been a constant increase in the relative population of B.C. and Alberta. Greater industrial development is encouraged by a larger population. Finally, there has been a change in the way that cattle processing is undertaken - there are now significant economies of scale that were not available forty years ago. The clustering of cattle processing in Alberta is also the result of new larger plants being built in the location that is the most economical. While transportation factors have been indispensable, all of these factors have played a role in shifting the cattle processing industry into Alberta.

6.2 Areas for Further Research

The process of conducting this research has illuminated several key areas where there are tremendous opportunities for further work. The opportunities fall into several different categories:

1. The lack of good statistical data for the earlier periods.
2. The impacts (if any) of differential wage rates on the location of production.
3. Today's markets for livestock and meat.

4. Transport and location of processing of other livestock, such as hogs, lambs and poultry (and perhaps even fish).
5. The development of trucking and the role of backhauls.

Throughout this study, there have been numerous references to data series that were developed, only to disappear several years later, data series that are unavailable before certain years, and data that is just plain unavailable. However, there are different levels of availability. In some cases, the data for the required series may not exist anywhere, but there are certainly other cases where the data may be obtained through access to the collections of the National Library of Canada, or the archives of Canadian Pacific or CN Rail. The livestock data are unquestionably better kept than the transport data, and so most of these opportunities lie within the field of transport history. The recovery of more data would also facilitate the use of statistical models in transport history.

Wage differences in different parts of the nation may affect the location of cattle processing, but this factor has also been ignored in this study. Preliminary examinations indicate that wages in the west were not very different (and perhaps relatively lower than eastern wages for meat packing) from wages in eastern Canada. Nonetheless, the ubiquity of labour is an important assumption of the model that is unexamined in this study.

This study can be used as a background for a more intensive look at the markets for beef and beef offal over the last ten years, and into the next century. Rising wages in the Pacific Rim, Mexico and other Latin-American countries suggest that there will soon be even larger off-shore markets for Canadian beef. The effects of these expanding markets on the cattle and beef transport system is an interesting subject. Other livestock distribution alternatives (i.e. air freight) have received little or no attention. Finally, this study can act as a complement to other studies that examine the history of the location of hog, lamb and poultry processing.

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