KATES PEAT MARWICK & CO.

THE WESTERN CANADIAN MARKET FOR IRON CASTINGS

DEPARTMENT OF REGIONAL ECONOMIC EXPANSION

December, 1973

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PRIVATE

January 4, 1974

Mr. A. G. MacLennan
Department of Regional
Economic Expansion
Industrial Development Branch
161 Laurier Avenue West
Ottawa, Ontario

Dear Mr. MacLennan:

We are pleased to submit our report entitled "The Western Canadian Market for Iron Castings".

This report summarizes the results of our study, which describes the markets for grey iron, ductile iron, and hard irons comprised primarily of ni-hard, ni-resist, and high chrome in the provinces of Manitoba, Saskatchewan, Alberta, and British Columbia. In addition, the North West Territories market is referred to.

THE OPPORTUNITY

Throughout the Prairies, foundries are working at the limits of their ability to produce, and are not constrained by the equipment facilities they utilize, but by the availability of scrap and pig iron, and labour.

A severe shortage of castings of grey iron and ductile iron is felt to exist by consumers in the Prairies, and our calculations show this shortage to amount to 3,561 tons of grey iron in 1974. Our calculations for ductile iron would indicate that a surplus of ductile iron exists, but we feel that distortion due to under-reporting of both out-of-province shipments and exports, and of consumption accounts for this anomaly, since quite certainly a shortage does exist. The shortages of both grey and ductile irons are particularly acute for buyers of high quality castings of small to medium size, purchased in medium to large quantities. Since no local producers exist in B.C. or Saskatchewan geared primarily for this sector, these two provinces particularly represent promising markets for any new foundry selling an acceptable product.

Expressed expansion plans by existing foundries indicate that Manitoba will in all probability have adequate supplies of both grey and ductile irons for local use by late 1974, but that high quality supplies for Saskatchewan and B.C. will not meet local grey iron requirements, and

high quality supplies of ductile iron will be only marginally adequate for Alberta.

Based on the foregoing, we feel that economic justification currently exists for an iron foundry to serve western markets, if such a foundry could consistently pour a high quality product. The Department of Industry, Trade and Commerce in Ottawa feels that the minimum economic size of any new iron foundry should be about 5,000 gross tons, and this size would appear adequate to meet demand at current and near term levels. It would appear sensible that any new facility should be designed so as to permit rapid expansion on a modular basis, because we feel that a rapid expansion of oilfield activity could quickly escalate western demand.

The optimum location for any new foundry would appear to be Saskatchewan, primarily due to the lack of a comparable foundry in that province, and the extent of customer dissatisfaction with current suppliers.

NEW MARKETS

Although we do not expect a major expansion of the agricultural equipment manufacturing sector, we nevertheless expect demand to continue at the current high levels into the last quarter of 1975. This industry is a major consumer of cast iron and is expected to remain so.

Expanded activity in oil and gas exploration and production is expected in Alberta and the North West Territories, which is served through Edmonton. The extent of such increase cannot currently be determined, but we would expect major increases in demand for valves and pumps, and other equipment peripheral to oilfield activities, with subsequent strong increases in demand from primarily Alberta industries.

We also expect that as raw material shortages and foundry closures in the United States continue, Canadian importers will increasing be forced to purchase their castings within Canada, enhancing the viability of any new western foundry.

NEW MATERIALS

Substitution of castings by other materials and processes is occurring under the current pressure on availability, primarily by forgings and fabrication. However, in many cases, this substitution is conceded to be temporary in nature, as all buyers readily admit that for the purposes in which they are employed, castings are clearly superior to fabrications, and forgings are largely unavailable. We, therefore, can anticipate no long term erosion of the demand for iron castings, except where very small quantities are required.

Mr. A. G. MacLennan January 4, 1974

CURRENT CONSTRAINTS

The current constraints on foundries are the supplies of scrap and pig iron and labour.

1. Prices of scrap and pig iron are escalating rapidly, and supplies are becoming extremely tight for both; in many instances, foundries have been placed on allocation for these basic materials.

2. Labour represents another major problem to the industry, in terms of availability, quality, and flexibility. Foundries are encountering difficulty in recruiting enough day workers, and the difficulty is much more serious for shift workers. In many cases, moreover, the skill and attitudes of the workers are considered sub-standard, despite high levels of unemployment. Such problems, if continued, would eventually lead to loss of flexibility within the industry caused by increasing mechanization, and a decline in levels of foundry skills.

In planning any new western foundry, careful attention would need to be paid to both problems.

We take pleasure in submitting this report to you, and have enjoyed undertaking this assignment on your behalf.

Yours truly

Kates, Peat, Marwick & Co.,

THE WESTERN CANADIAN MARKET FOR IRON CASTINGS

TABLE OF CONTENTS

TABLE OF CONTENTS

FIGURES

APPENDICES

CONCLUSION

THE EXTENT OF THE SHORTAGE

Under current economic conditions, we estimate that a shortage of 3,561 tons of grey iron exists throughout the Prairies which represents 30% of the supplies available. When the province of British Columbia is included, this shortage amounts to 3,780 tons.

The figures for ductile iron appear to indicate a current surplus of 1,109 tons of ductile iron for the Prairies, and 887 tons for the West as a whole. However, we feel that these figures have been distorted by foundries underestimating exports and out-of-province shipments, particularly to eastern Canada, and by companies underestimating their demand.

THE SPECIAL ASPECTS OF THE SHORTAGE

The interview program clearly established that serious shortages exist throughout the West in grey and ductile iron. Moreover, the situation is at its most critical in the supply of high quality, machinable castings of both grey and ductile iron in medium to high quantity run configurations.

THE PROVINCES

The provinces of Saskatchewan and British Columbia do not appear to have foundries which can pour castings of the above configuration,

although both provinces have significant users purchasing in this sector. In fact, both provinces have foundries which are oriented toward relatively heavy, small quantity castings with a lower quality requirement, mainly for primary industry and municipal usage.

Manitoba may be characterized as being well served by foundries at the quality and technical expertise level, although current shortages exist. These shortages should be considerably reduced as new capacity is utilized, and as operations are made more efficient through 1974.

Alberta has grey and ductile foundries with enviable reputations for quality. With only marginal capacity growth over 1974, however, Alberta can be expected to encounter shortages well into 1975.

In fact, any foundry in the West which can pour machine quality castings has totally committed production for most of 1974 and, in some cases, well into 1975.

B.C. foundries are not committed to the same degree, and lead times are notably shorter.

THE OPPORTUNITY

Because of the shortage of high quality, machinable castings of both grey and ductile iron, we would anticipate that definite opportunities exist for a new entrant to the market consisting primarily of manufacturers of agricultural implements, valves and pumps, and hydraulic equipment.

We would expect sales to be directed toward Saskatchewan, Alberta, and B.C., since significant competition could be expected from the highly competent Manitoba foundries. Manitoba foundries are well aware of the current situation, and are reacting quickly.

The current need is beyond doubt, but the long term need has yet to be assessed. The three Prairie manufacturing sectors are geared to agricultural implement manufacture, and oilfield activity. Projections by Kates, Peat, Marwick & Co. show that demand for agricultural implements will probably be sustained at current levels until the last quarter of 1975, when a mild cyclic downturn is expected. We would also expect that due to the current world energy situation, oilfield activity will accelerate sharply throughout the West, providing legislation at provincial levels is not inimical. We expect, therefore, increased activity in Alberta and the Territories, leading to increased demands for castings of all types in these areas until well into the 1980's. In conclusion, therefore, we feel that short-term demand is highly supportive of new capacity, the medium term (2 to 5 years) is slightly less optimistic, while the long term prospects are good.

THE LOCATION

With the above factors in mind, we feel that the optimum location for a foundry pouring grey and/or ductile iron would be Saskatchewan, primarily because customer satisfaction, quality, and availability appear to be at their lowest levels while resistance by established suppliers would be less than in any other western province.

We feel that customer dissatisfaction is so high that a newly established operation would have little difficulty in penetrating the markets of the current suppliers, and in securing some of the business these foundries have failed to capture. Finally, transportation costs could easily permit the company to sell further west.

II - THE WESTERN CANADIAN MARKET FOR IRON CASTINGS

INTRODUCTION

This report summarizes the results of a brief analysis of the western Canadian market for iron castings, including grey iron, ductile iron, malleable iron, and others, taken in broad perspective. The purpose of the study was:

- to determine the current market conditions throughout the West for iron
- to determine whether any obvious opportunities for economic development exist, and to give our impressions of the nature of these opportunities
- to serve as a promotional tool in approaching interested parties for DREE.

This report is intended to indicate where areas of promise lie, and not to analyze these areas of promise. Such analysis would necessarily be the subject of a more detailed study, having regard to specific types of iron, quality, volume, and weight per casting parameters.

Method of Approach

The study was undertaken in accordance with your requirements as set out in a letter from Mr. M. J. Brennan of your Regina office dated September 27, 1973, and our subsequent interpretation of these requirements, as outlined in our letter of proposal dated October 5, 1973, which was later accepted. Contact with the Department of Regional Economic Expansion was maintained during the course of the study by

Mr. Dotchin, these contacts being established with Mr. Hore, of the Western Task Force on Iron and Steel in Ottawa, and Mr. Brennan of the Regina office.

In assessing the supply side of the market, 25 of the 43 ferrous foundries were visited personally, and the remainder were telephoned. In only one case was resistance encountered. For each foundry, a detailed, five page questionnaire (see Appendix A) was completed, which gave considerable detail of the operations of these foundries.

On the demand for casting products, a blanket telephone survey was conducted of 350 probable users, with a follow-up interview of those companies purchasing more than $200,000 of ferrous castings per year. In all, 75 detailed questionnaires were completed. A copy of this questionnaire is included in Appendix B.

Additionally, contact was made with the relevant departments of provincial governments, the Department of Industry, Trade & Commerce in Ottawa, the American Foundrymen's Society in Chicago, and the Grey and Ductile Iron Founder's Society in Cleveland, to verify, where possible, the aggregate figures obtained from direct interviews and industry trends.

III - CONSUMPTION

GENERAL

The figures which quantify provincial demand are based on the interview program, and largely encompass the manufacturing sector. The demand for municipal castings was not investigated at the user level, but the data was available for B.C. from a previous study, and was prorated to obtain the relevant value for the three Prairie provinces. Demand figures do not include local purchases made by CN/CP Railway systems because these companies release data only through their Central Purchasing Department in Montreal. However, most local purchasing officers of the railroads confirmed that local purchases are small, with the majority of castings being purchased strictly on price from large eastern foundries. Since the railroad companies transport the castings themselves, F.O.B. factory price is critical, and, in this respect, the eastern foundries have an undoubted advantage as confirmed by several western foundry operators.

In calculating incremental demand, we have asked consumers to estimate their additional requirements to 1973 purchases, based on the year-to-year forecasts of sales; on castings which they would buy, but cannot due to the current shortage; and current castings imports which would be sourced locally if available. As far as possible, re-sourcing of castings purchased in other Prairie foundries to foundries in the same province was excluded from the figures for incremental demand. It

should be noted that notwithstanding the relationship between recorded supply and recorded demand, the incremental demand figure represents a perceived shortage of castings at the consumer level. We feel, therefore, that there is a reliable indicator of the need for extra capacity. The year-to-year sales increases, as a component of incremental demand, indicate expectations based on current business conditions, and could quickly be scaled back if a sudden downturn should occur.

We feel that the respondents' awareness of the client for whom this work was undertaken and their agreement with the need for such a study engendered a co-operative attitude among buyers. In very few cases was there less than wholehearted approval of the need for and aims of the fact-gathering -- so seriously did the buyers view the casting supply situation in the West.

Finally, the companies interviewed frequently supplied a dollar value for their casting purchases as opposed to a tonnage figure. In order to convert dollar values to tonnage, an average price of $.30 per lb. was applied to grey iron, and $.42 per lb. to ductile. The values of jobbing grey and ductile castings would be higher in B.C. than elsewhere in the Prairies because of high costs of scrap and labour. However, because of the large number of foundries pouring relatively cheap municipal castings, we feel that this factor will reduce the B.C. values to the point where they coincide with those obtained elsewhere in the Prairies. In addition, the average price of hard iron castings is taken at $.80 per lb., and includes ni-hard, ni-resist, and high chrome.

Figure 1

CURRENT AND INCREMENTAL DEMAND BY PROVINCE - 1973

PROVINCE	CURRENT DEMAND (TONS)				TOTAL	INCREMENTAL DEMAND (TONS)				TOTAL
	GREY	DUCTILE	MALLEABLE	OTHER	CURRENT	GREY	DUCTILE	MALLEABLE	OTHER	INCREMENT
MANITOBA	6,187	2,611	14	NONE	8,812	1,921	545	NONE	2	2,468
SASKATCHEWAN	992	511	NONE	119	1,622	49	255	NONE	14	318
ALBERTA	1,210	726	7	9	1,952	213	232	NONE	2	447
TOTAL JOBBING PRAIRIES	8,389	3,848	21	128	12,386	2,183	1,032	NONE	18	3,233
PRAIRIES (MUNICIPAL)	4,606	NONE	NONE	NONE	4,606	(5%) Est.230	NK	NK	NK	NK
ALL PRAIRIES	12,995	3,848	21	128	16,992	2,413	1,032 MIN.	NK	18 MIN.	3,233
B.C. JOBBING	1,223	1,825	NONE	1,000	6,548	290	367	NONE	NK	657
B.C. RESOURCE	2,500	NONE				(10%)250	NONE			
B.C. MUNICIPAL	4,000	NONE	NONE	NONE	4,000	Est. 5% 200	NK	NK	NK	NK
ALL B.C.	7,723	1,825	NONE	1,000	10,548	740	367 MIN.	NK	NK	657
TOTAL WEST	20,718	5,673	21	1,128	27,540	3,153 MIN.	1,399 MIN.	NONE	NK	3,890

HISTORICAL CONSUMPTION

Historical consumption data were not available from statistical sources, since the information is not gathered at the national or provincial levels. Any data relating to historical consumption would need to be gathered on a company-by-company basis, and most companies were plainly reluctant to devote the time necessary to gather such information from their records, with many refusing outright.

Such statistical data available on a provincial basis relates to production figures which are detailed in Section IV as "Shipments of Goods of Own Manufacture".

The interview data relating to 1973 production and the projected growth for 1974 and 1975 are more meaningful in assessing future production and in assessing the balance of supply and demand.

CHARACTERISTICS OF PROVINCIAL DEMAND

Current and incremental demand for iron castings by province are shown in Figure 1, opposite.

Manitoba

The Manitoba market is highly attuned to the agricultural implement and allied industries. By our calculations, 95% or 5,895 tons of the total 6,187 tons of the grey iron demand falls within this area, as does 98.5%, or 1,536 tons of the total 2,611 tons of the ductile iron demand.

The five largest consumers of castings in the province are:

- Versatile Manufacturing
- Canadian Co-operative Implements Limited
- Allied/Alco Manufacturing Limited
- Kilberry Industries Limited
- Canadian Tool and Die Limited.

We estimate that these five companies alone consume at least 80% of the castings within the province. Consequently, their requirements largely dictate the weight/quantity production patterns of local foundries, and force high standards of quality control and consistency of product. In concrete terms, this means that most castings weigh less than 50 lbs., and a high proportion of these weigh less than 25 lbs. per piece. The quantities normally are not less than 100 pieces, and are frequently ordered by the thousands.

Quality and consistency are normally very good, with very stringent requirements for porosity control. Because of the purchasing power of these companies, prices tend to be tightly controlled, and buyers for these companies do not expect the same degree of price escalation in castings that smaller purchasers foresee.

Again, these companies are sophisticated buyers and have scheduled their demands for 1974 well ahead of time. They seem relatively confident of obtaining their supplies, and lead times for new items are conspicuously shorter than those quoted elsewhere in the Prairies. The one large company which is having difficulty in controlling prices and

deliveries is actively planning the erection of a foundry which would serve not only itself but the general market.

While these larger companies expect annual price rises of 10-15%, the remainder of the small buyers look for annual price escalation of 10%, which we feel is unrealistically low.

The large companies are encountering lead times of six to eight months on new items, while small users quote deliveries of four months to two years for grey iron, and some state that ductile iron is unavailable.

All buyers are concerned about delivery and availability within the province, stating that the problem has been made considerably worse by the amount of castings going out of the province, and by the action of Monarch Industries in withdrawing from the jobbing market. Most companies felt that under current conditions of increasing prices, extending deliveries, and increasing lead times, more foundry capacity is necessary in Manitoba to increase supply and competition, in both grey and ductile iron.

Saskatchewan

The market characteristics of Saskatchewan differ from those of Manitoba chiefly by the addition of the Potash Mining Industry requirements. Although the agricultural implement industry still accounts for 78.5% of the 992 tons of grey iron purchased, and 87% of the 511 tons of ductile iron purchased locally, the mining industry is an important purchaser of hard iron, such as ni-hard, and ni-resist.

The major casting buyers in the province are:

- Morris Rod Weeder Limited
- Degelman Industries Limited
- Rock-O-Matic Limited
- Potash Company of America Limited.

Morris Rod Weeder alone accounts for more than 60% of the identified market of grey iron, and more than 50% of the market for ductile iron.

Since the three Saskatchewan foundries in general are not geared to the requirements of the agricultural implement industry, most of the castings for this sector are purchased elsewhere in the West. As a consequence, although Saskatchewan demand is such that high volume, light weight, high quality castings are required (mostly 50 lbs. or less, runs of 1,000 or more pieces), none of these foundries can assist to any important degree.

The general machinery and mining sector, which is effectively the rest of the market, chiefly calls for slightly larger castings in much smaller quantities (on average between 50 to 250 pieces per run).

Because of their highly fragmented nature, the remaining consumers cannot successfully pressure local producers to control price and quality. Many buyers have had to absorb what they feel are excessive price rises, and all appear dissatisfied with quality.

In addition, one local foundry appears to be curtailing the range of metals it pours, and several companies state that they are substituting other processes or materials for ferrous castings, at least until the supply eases. It is notable that while many buyers do not like the situation, they are resigned to more price increases, but their feelings are considerably stronger about increased delivery periods (which range from 12 weeks to one year) and particularly about poor quality.

Unless the three foundries can rapidly increase the quality of their castings, it would appear that they are extremely vulnerable to any new competition, should it appear locally. Certainly, any new foundry could realistically hope to supply some of the major local users if it could control quality and consistency. We estimate that current prices of roughly $.20 to $.30 per lb. for grey iron, $.40 to $.45 per lb. for ductile iron, and $.90 to $1.40 per lb. for other irons are current, and look for an annual price increase of 15% to 20% for 1974.

Alberta

In the Alberta market, agricultural implements decline in importance to 25% of grey iron purchases and 29% of ductile iron purchases, while valves and oil field equipment account for 46% of grey iron, and 38% of ductile iron. The remainder of the demand is absorbed by jobbing machine shops, primary materials processors, and special vehicle manufacturers. The total market in the jobbing sector is 1,210 tons of grey iron, and 726 tons of ductile iron.

The five main iron castings consumers in the province are:

- FWI (Canada) Limited
- EZEE-On Manufacturing Limited
- Coutts Machinery Limited
- Edwards Rod Weeder Limited
- Lufkin Machine Limited.

These five companies alone account for more than 50% of grey iron and more than 25% of ductile iron purchases within Alberta.

Those castings for the agricultural implement manufacturers all weigh less than 25 lbs., and the majority are ordered in quantities of 500 or more. Current lead times encountered by buyers in this sector are 6 to 8 months , which are considered to be generally satisfactory because of the scheduling abilities of the companies. This sector encountered price rises of 38% over 1973, and expects approximately a 15% increase over the course of 1974.

The valve manufacturing sector (which also includes valve controls) buys grey and ductile iron, generally purchasing 70% of its iron requirements in casting weights of 25 lbs. or less with a like proportion of orders for 100 pieces or less per pattern per release.

Lead times range from four months to one year, and are constantly being extended with consequent reductions in general availability of castings. Lethbridge Iron Works is not accepting orders until November 1974 at which time six months lead time will still be

necessary. Buyers are expecting 1974 price escalation of 10% to 20% on an annual basis. The delivery periods are generally considered unsatisfactory, but are accepted as a necessity. Quality appears to be good from local foundries, but some desire for increased capacity in ductile iron was expressed.

Oil field equipment covers a range of castings, from integral parts with the bulk of castings falling between 20 to 50 lbs. per piece, to pump counterweights, with the majority weighing more than 500 lbs. per piece. Delivery periods range from one to six months. Although this range is better than that in the agricultural implement industry, it is nevertheless considered unsatisfactory because of the speed with which the oil industry desires to react to events. Prices of 10% to 15% are expected, and although lead times are becoming extended, most buyers feel that there is little reason to blame foundries, given current conditions. The need for greater capacity or a new foundry was expressed, but this arose purely from availability, not from poor service or quality. One company interviewed could only obtain 50% of the castings it would prefer to buy, given improved availability.

The remaining companies purchase over the entire weight range, with the bulk falling into small run quantities of grey and ductile iron. Unsatisfactory lead times of 6 to 12 months are common for ductile iron. A large buyer of grey iron, with purchases over the entire weight spectrum in small quantities has been obtaining one week delivery, which is satisfactory. Expected price increases range from 5% to 20%,

availability is decreasing, and some buyers are actively searching for ductile substitution by purchasing finished components. In general, the lack of ductile iron has been keenly felt, and further capacity is deemed necessary. No adverse criticism of quality or service has been encountered.

Demand for hard irons has been extremely small in the manufacturing sector and, in the resource sector, these castings tend to be sold as proprietary products, and hence come from captive production.

British Columbia

The B.C. market may be said to cater largely to the resource industries, notably logging and timber, paper, mining, and cement, with a very few major manufacturing companies who could be considered important buyers.

The five major companies purchasing iron castings in B.C. are:

- Alcan Limited at Kitimat
- Gearmatic Limited
- Bingham Pump Limited
- S. Madill Limited
- Singer Valve Limited.

The four manufacturing companies within this group cover the entire weight range of castings, (particularly the heavier range) on the questionnaire and, with the exception of Gearmatic, generally order in small quantities. Because they all have fairly stringent quality requirements in terms of shrinkage and porosity, three of the four

purchase many of their castings from outside the province, where deliveries and lead times are much longer. Local lead times are 8 to 12 weeks, while outside the province 4 to 11 months appears the norm.

These buyers, with one exception exhibit strong reservations about the technical abilities of local foundries, and claim that they have scrap rates of up to 40% from these foundries. They are extremely dissatisfied with this situation, and one even imports castings from the U.S. at uncompetitive prices to obtain the necessary quality and delivery.

Expected price rises for 1974 range from 10% to 30%, and the majority consider that additional foundry capacity is necessary, with high technical capability in quality control.

The remaining users in the province tend to be resource industry oriented, and as such do not have the strict quality requirements of the previous manufacturing group. Although lead times are increasing, they are considerably shorter than in any other western province. It therefore follows that since demand is relatively less, pure demand-pull influence on prices is minor.

The Northwest Territories

According to the Department of Industry and Development, Government of the Northwest Territories, the only consumers of iron castings in the Territories are:

- Giant Yellowknife Mines
- Cominco, Yellowknife
- Cominco, Pine Point.

The Department estimates that these three mines would annually purchase an approximate total of 1,200 tons of iron balls for grinding media from Edmonton. No manufacturing consumers of iron castings are felt to exist and the oil exploration companies purchase proprietary parts rather than raw castings.

IV - PRODUCTION

Under current conditions, foundries throughout the Prairies are working at the absolute limits of their ability to produce, but in many cases this limit is imposed by the price and availability of scrap, pig iron, and labour. In many instances, foundries could increase output by installing a second or third shift, but have encountered serious resistance by labour to shift work, to the extent that these plans have had to be dropped. Many prairie foundries, in fact, feel that they are understaffed for regular working hours, and are encountering some difficulty in attracting any labour. This point is discussed in more depth in Section V.

All foundries are concerned about pollution control, and the extent of the required outlay for nonproductive equipment, but these concerns are particularly acute in B.C. at the moment, where stringent draft legislation considered is a matter of serious worry.

Twenty-one foundries across the West are planning to augment productive capacity or increase the utilization of existing plants by procedural improvements or equipment modernization, but the firmness of the commitment and the adequacy of financial resources of the foundries which would permit such expansion varies from case to case. One foundry less committed to the industry in B.C. is talking of closing down.

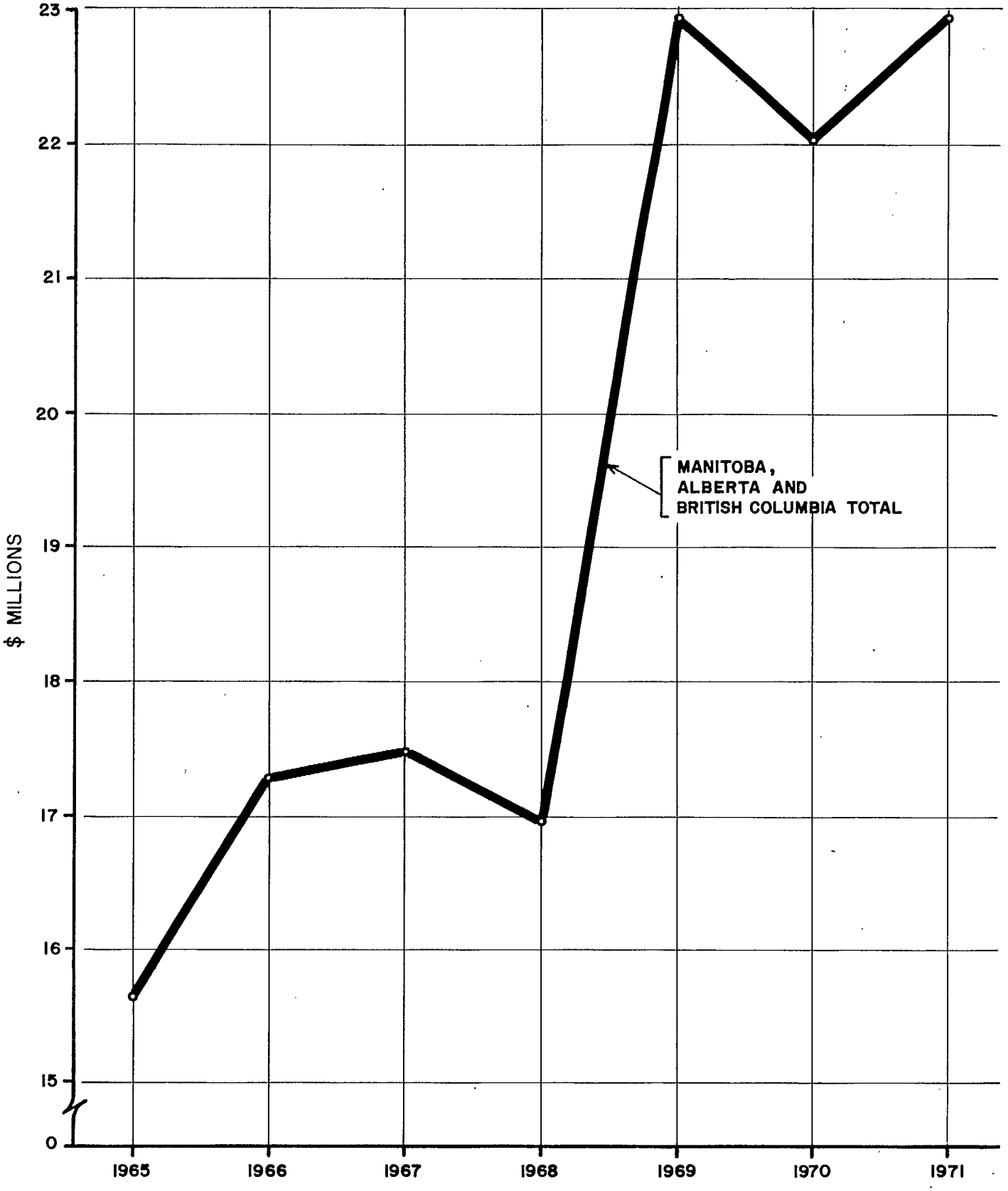
STATISTICAL DATA

The "Value of Shipments of Goods of Own Manufacture" are shown

Figure 3

VALUE OF SHIPMENTS OF GOODS OF OWN MANUFACTURE (1965-1971)

ALL IRON CASTINGS INCLUDING PIPE AND FITTINGS

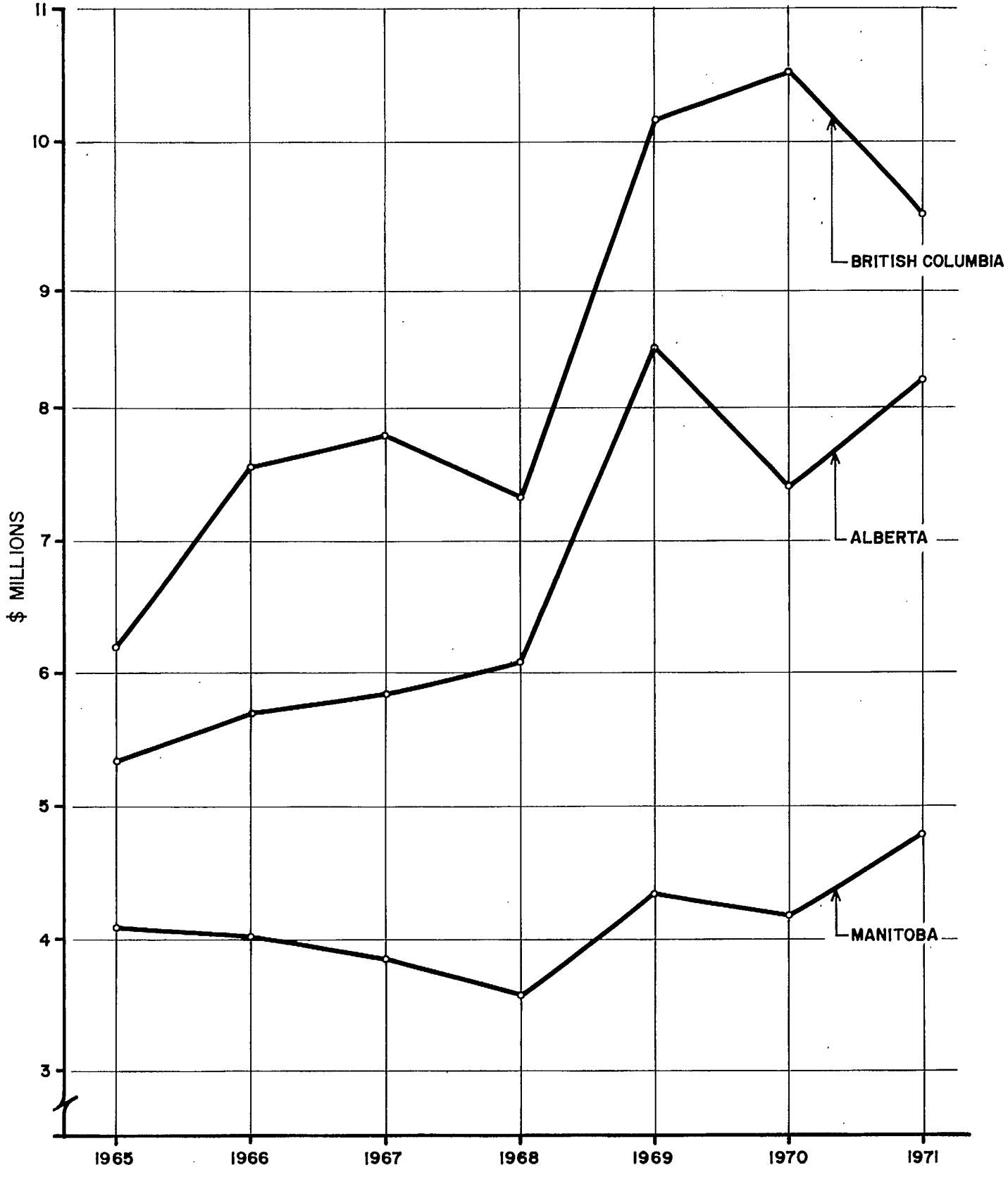


SOURCE: STATISTICS CANADA 41-226

Figure 2

VALUE OF SHIPMENTS OF GOODS OF OWN MANUFACTURE (1965-1971)

ALL IRON CASTINGS INCLUDING PIPE AND FITTINGS



SOURCE: STATISTICS CANADA 41-226

in Figures 2 and 3, opposite, for Manitoba, Alberta, and B.C., and the three provinces together over the period 1965-1971. The figures for Saskatchewan are not available from Statistics Canada because of the confidentiality requirements of the department. In addition, the figures gathered from foundries during the course of our survey are not really separable into a value for "Shipment of Goods of Own Manufacture" because of compatibility of definitions. Therefore, the equivalent values for 1973 cannot be calculated from our data.

Nevertheless, from Figures 2 and 3, we can say that over the seven year period, average annual rate of production growth was 2.25% for Manitoba, 6.25% for Alberta, 7.0% for British Columbia, and 5.75% for all three provinces.

IMPORTS AND EXPORTS

Statistical data relating to imports and exports of iron castings by province or region appear to be unavailable from Statistics Canada, provincial governments, the American Foundrymen's Society, the Grey and Ductile Ironfounders' Society, or the Metal Casting Industry Census.

However, data relating to interprovincial shipments and exports are detailed in Figure 4, while a further breakdown of data relating to western interprovincial shipments is given on pages VI-4 and VI-6.

Importation of iron castings was reported by 10 companies of the 75 for which detailed questionnaires were completed, and in all cases, the country of origin was the U.S.A., primarily the west coast.

Manitoba purchasers reported importing only grey iron, Saskatchewan companies reported no imports, and B.C. and Alberta purchasers import grey and ductile iron.

It was significant that all those companies reporting imports were users requiring machine quality castings, with fairly high volume requirements.

Eight companies imported grey iron and the amount of those imports came to 1,144 tons for the five companies which quantified their U.S. purchases. Five companies imported ductile iron, and the amount of ductile iron imported was 114 tons by the three companies which quantified their U.S. purchases. All imports are included in the consumption figures quoted by the responding companies.

SURVEY RESULTS

In examining and tabulating the survey results, it should be remembered that most western iron foundries pour both grey and ductile iron, usually from the same melting facilities. Therefore, with a few exceptions, the proportions of grey and ductile iron can be changed at will to react to changing circumstances. The same is largely true of the proportions of jobbing and captive work undertaken. Since the price of ductile iron is higher than grey iron, a foundry will tend to maximize the proportion of ductile iron poured at the expense of the cheaper

grades of grey iron when the requisite skills and market are available. In a like manner, most jobbing foundries would obtain a higher price for their branded products where a market exists, and they will thus tend to maximize captive production. This is not true, however, if the captive products are pipe, and the jobbing component is custom castings. Thus, in times of extreme shortage, one would expect foundries manufacturing pipe to undertake jobbing custom castings if they possess the required facilities.

The situation in British Columbia is even more complicated because foundries there tend to pour not only various grades and types of iron, but also steel castings, from the same facilities. Thus, not only can the proportions of various types of iron change quite rapidly, but also the total amount of iron can fluctuate as demand for steel or price of steel castings changes.

The results reflect, therefore, the answers given by foundry owners, operators, or managers under current conditions and because of the shortage throughout the West, we feel here also that enlightened self-interest has encouraged an enthusiastic response.

Manitoba

In Manitoba, nine ferrous foundries were contacted, all of which poured some iron. Of these nine, only Manitoba Bridge, Thor and Anthes appear to sell more than 1,000 tons of grey iron jobbing product annually, while only Teledyne Bell and Anthes appear to sell more than 1,000 tons of ductile iron jobbing product annually. The jobbing market for hard iron is supplied locally only by Abex and Manitoba Bridge.

From the data supplied, it would appear that Anthes, Thor, and Manitoba Bridge contribute more than 90% to provincial jobbing grey iron production, while Anthes and Teledyne contribute 95% of provincial jobbing ductile iron production. Anthes Foundry is almost twice as large in terms of jobbing production as the next largest foundry, so that actions at this company have a major impact on Manitoba production. In particular, its decision to switch from captive production to jobbing production in 1970-71 had a major continuing impact on provincial jobbing capability. Since that time, Anthes has implemented a more than three-fold increase in jobbing production. Thus, the current uncertainty due to the facility's probable change of ownership and possible changes of policy cause major uncertainties within the provincial market.

The current conditions of demand within the province are such that major foundries are almost fully booked until the end of 1974. The ability to supply further demand is almost negligible without further expansion and investment, unless the foundries concentrate on redirecting their production from out-of-province buyers to local purchasers. If we assume that 100% of exports and out-of-province purchases are jobbing castings, then fully 40% of Manitoba jobbing production is leaving the province. If out-of-province purchases were cancelled, therefore, local supply could quickly be almost doubled. However, this likelihood appears remote.

Anthes appears able to meet almost any local requirements for weight or quality with its equipment, if casting weight is less than

300 lbs. It serves eastern Canadian, other Prairie, and export markets as well as Manitoba.

Thor Foundry serves the market for lighter castings in large quantities, serving the Manitoba market only. Bell Teledyne appears a parallel situation to Anthes, except that it specializes in ductile iron, while Manitoba Bridge concentrates on local demand for heavier castings in small quantities.

The quality requirements in the local market are very exacting, calling for machine quality castings with a high degree of consistency. Local foundries have adjusted to these requirements well, and there appear to be no major complaints on quality.

From our own data and that supplied by the Department of Industry of Manitoba, we do know that since 1971 the production of custom castings in Manitoba has increased to 18,308 tons from 7,450 tons -- an increase of 146% in two years. This explosive growth is not truly indicative of the situation in other western provinces over the same period because, during that period, Anthes began the switch from captive to jobbing production, while Monarch did exactly the reverse. Since Monarch is much smaller than Anthes, the result is a net increase which has assisted local purchasers in obtaining castings, but the Monarch action, coming at a time of peak demand, has exacerbated a serious problem of availability.

As expected, in meeting the quality requirements of local industry, the local foundries have enhanced the marketability of their

products throughout Canada. This is the positive aspect of the local shortage which must enhance the future prospects of Manitoba foundries in terms of available markets.

Forecasts of Kates, Peat, Marwick & Co. into the demand for agricultural implements indicate a possible mild cyclical downturn commencing in late 1975, but buoyant demand at current levels is expected until that time. Consequently, current demand levels for castings can be expected to persist for at least two years.

Saskatchewan

In Saskatchewan, only three ferrous foundries are operating: two in Saskatoon and one in Regina. John East alone produces more than 1,000 tons, and only John East produces ductile or hard iron.

Blanchard Foundry, which is a captive producer, is oriented toward the agricultural implement market, and the majority of castings produced weigh 50 lbs. or more. Quantities are fairly evenly divided between small quantity jobbing and small to medium sized production runs, i.e. 100 to 1,000 items.

For grey iron, both Norwood and John East cater heavily to the small quantity, medium weight castings required by the municipal and primary industry sectors. In ductile iron, weights are small, and so are release quantities.

Thus, all three foundries are heavily oriented to relatively rough castings (i.e. not machine quality) and do not exercise tight

controls on quality, at least as far as porosity and shrinkage are concerned. As a direct consequence, the largest purchaser of castings in the province is forced to look elsewhere for his supplies. Moreover, complaints regarding quality of local castings are widespread. It is, therefore, fair to say that due to quality, the limited range of production, small volumes and high price, the ability of local foundries to supply local demand is poor. We feel it is no exaggeration to state that these foundries are currently extremely vulnerable to any new local competition, especially when Blanchard Foundry, a captive operation, must move its facility in the very near future, and when the rumour is widespread that John East would like to withdraw from the foundry scene.

It would appear that an aggressive, competent foundry operator could succeed in Saskatchewan in spite of three entrenched local foundries because of the presence of:

1. A large user wishing to purchase locally (given constant good quality).
2. An improving potash industry serving a rapidly expanding market.
3. An expanding service sector to the mining industry.
4. A weak, apparently disinterested local casting supply with poor quality control.

In terms of expectations for future business, the potash and agricultural implement industry are expected to remain strong over the next two years, since both are geared to the level of farm incomes. The potash industry, moreover, is geared to world, not merely local,

agricultural activity, since the 10 local mines make Canada the second largest potash producer in the world. Therefore, if local farm incomes decline, fairly brisk export demand for potash should act as a stabilizer to the local economy.

All three foundries supply at least 75% of their production to local demand, with the remainder going to other Prairie provinces, and a small amount to B.C. Even so, current lead times are 10 to 14 weeks (and increasing), for those buying locally, and range up to 6 months for those purchasing outside Saskatchewan, particularly in Alberta.

Alberta

Eight foundries were contacted in Alberta, of which four were wholly captive. Of the remaining four, only Dominion Bridge appears to produce more than 1,000 tons of jobbing grey iron, and no foundries produce more than 1000 tons of ductile. Four local foundries are in the jobbing market for hard iron, Sovereign being the most important.

Of the four jobbing foundries, Sovereign Castings tends to pour municipal castings, or heavier, small quantity requirements in grey iron. In ni-hard, light weight castings in small lots are the current configuration, largely for local consumption.

Lethbridge Iron Works tends to specialize in light weight, high volume castings and sells throughout the West (less than 50% of production is consumed in Alberta). It has broad areas of expertise in the agricultural implement, valve, and special vehicle industries.

The company is recognized as a producer of high quality castings, and because of its reputation, not only serves a wide Canadian market, but exports to the U.S.A. as well. Demand at the moment is such that the company can command premium prices. In spite of this specialist ability, the company effectively covers the entire spectrum of casting weight/quantity requirements.

In a similar position, Norwood Foundry ships medium weight castings in small to medium quantities serving the entire West, but the majority are shipped to Alberta users. The company primarily pours grey and ductile iron, with some ni-hard and ni-resist, and currently enjoys very short lead times. Norwood also has broad expertise in municipal castings, and can pour heavy castings as required. In its chief market, quality requirements are not as stringent as those required for agricultural implements.

Dominion Bridge concentrates on the Alberta market for short to medium run iron castings, the majority of which weigh more than 50 lbs. per piece. The company supplies municipal castings, mill liners, and heavy counterweights, and therefore is largely in a noncritical area with respect to quality control.

In general, Alberta foundries cover the entire spectrum of ferrous foundry production in terms of quantity, weight, and quality. Those foundries consistently producing quality castings are swamped with work, while those in the smaller quantity, less quality conscious market are less so. Nevertheless, supplies may be considered tight. Under

current conditions, ability to supply is considered fair to poor, with a critical blockage in ductile iron, forcing local buyers to purchase elsewhere, and causing some substitution to proprietary products. Only one adverse comment with regard to quality was received.

British Columbia

Nineteen foundries pouring iron were contacted in B.C., of which 15 are in the jobbing market for grey iron, and eight are jobbing ductile iron.

McLean and Powell, Mainland, and Dobney are the primary producers of jobbing grey iron, contributing some 80% of local production. CAE is the main supplier of jobbing ductile iron (according to data supplied), contributing at least 30% of local production. Mainland appears to be the primary supplier of jobbing hard iron castings.

Jobbing grey and ductile exports from B.C. seem to be negligible, but some grey iron, amounting to 6% of total jobbing grey, is exported -- largely by Mainland Foundry. Thompson Foundry exports a large proportion of production to the U.S.A., but mainly from captive capacity.

Local foundries in general serve only the local market, which is primarily oriented to resource industries and does not demand machine quality castings. As a consequence, the local purchasers who require high quality standards must look elsewhere, and represent a segment which local producers lack the ability to supply. With the current expansion plans of existing foundries, and the entry of the Cominco Foundry at

Trail into the jobbing market, we anticipate that the resource and municipal markets will be adequately served. The areas of opportunity lie in the high quality, large quantity, medium weight sector of the B.C. market, since most local foundries are geared for low quantity, medium quality, medium weight markets for jobbing castings. One obvious exception is the Thompson Foundry, which tends to specialize in complex manifolding.

METHOD OF MARKETING

In all foundries contacted, the jobbing output of foundries is sold directly to the consuming company. Many foundries do not employ salesmen and rely on the personal efforts of senior management wherever sales efforts are needed. Under current market conditions, sales effort is not required.

Only in the sale of captive production were other sales methods encountered. In this case, although direct selling was still prevalent, we did encounter companies utilizing commission agents and occasionally stocking distributors.

V - RAW MATERIAL SUPPLY

PRODUCTION INPUTS

Scrap & Pig

In the majority of foundries visited, the real constraints on increased productivity, indeed on total production, are availability of scrap, pig iron, and labour.

Scrap is very expensive throughout the West, in some cases approaching the cost of pig iron. Prices ranged from about $64 per ton in Manitoba to about $72 per ton in British Columbia in November, and pig iron has also begun rising in price. Since availability is also limited, foundry operators have little choice but to pay the price and pass on the cost.

With scrap price levels now approaching those for pig iron, substitution is occurring in some cases. However, pig iron as a solution to scrap shortage is of little use because within the last two weeks, a major pig iron supplier has placed his accounts on allocation.

Labour

The other major constraint is labour. There can be little doubt that a foundry is a dirty work environment, and is demanding in terms of strength and skill. The effect of increased welfare and unemployment benefits on foundries has been a scarcity of skilled,

reliable labour in spite of high levels of unemployment. Turnover is extremely high, and appears to be increasing.

There is no doubt that the higher educational levels, and higher expectations for a work environment have severely shrunk the pool of labour willing to enter the foundry industry. The effects of this shrinkage are expected to impair the operations of foundries on a continuing basis, particularly if they are not modernized. The only apparent alternative is mechanization, which we would expect to impair the flexibility of small foundries, and to restrict the future supply of skilled foundry personnel.

COMPETITIVE MATERIALS AND PROCESSES

The long term effects of the current labour and raw material shortage, and the continuing demand for iron castings are expected, over the long run, to increase the size of a minimum economic order to accomodate increasing mechanization.

In the short term, the situation is causing some temporary switching to competitive materials and processes, particularly fabrication and forging. This switching is held to a minimum by the concurrent price rises of steel products, labour costs associated with welding, and the lack of competent forging facilities in the West. One company interviewed was importing forgings from Texas to Alberta, because where extensive machining was contemplated, there was little doubt of the superiority of forgings in view of the quality problems, particularly porosity, encountered with locally produced castings. In only one case

did we encounter the desire to switch to another metal, this being a switch from iron to aluminum castings.

In conclusion, we feel that switching to other materials and processes is a temporary phenomenon, engendered purely by lack of availability of castings. In general, those people currently using castings feel that they are the best material for the designed use, and will continue to be so. In the longer term, however, we foresee that, where small quantities are envisaged, increasing mechanization will force the substitution of castings with fabrications.

Figure 5

PROVINCIAL NET JOBBING IRON CASTINGS SUPPLY
AVAILABLE FOR LOCAL DEMAND

PROVINCE	LOCAL NET JOBBING PRODUCTION			75% OF EXPORTS (EXCLUDING WHOLLY CAPTIVE)			CANADIAN SUPPLY			INTER PROVINCIAL SHIPMENTS			INDIGENOUS PROVINCIAL SUPPLY		
	GREY	DUCTILE	HM	GREY	DUCTILE	HM	GREY	DUCTILE	HM	GREY	DUCTILE	HM	GREY	DUCTILE	HM
MANITOBA	8,487	7,623	998	506	1,008 (100%)	19	7,981	6,615	979	1,514	2,765 (100%)	210	6,467	3,850	769
SASKATCHEWAN	1,461	360	120	NIL	NIL	NIL	1,461	360	120	312	54	18	1,149	306	102
ALBERTA	3,517	1,439	601	90	26	32	3,449	1,413	569	605	450	98	2,844	963	471
TOTAL PRAIRIES													10,140	5,800	1,342
B.C.	8,254	1,006	696	135	103	NIL	8,119	903	696	414	23	32	7,705	880	664
TOTAL WEST													17,845	6,680	2,006

Figure 4

WESTERN FOUNDRY PRODUCTION BY PROVINCE AND DESTINATION (TONS)

LOCATION	TOTAL GROSS TONNAGE AT CAPACITY	TOTAL NET TONNAGE AT CURRENT UTILIZATION	GREY IRON (TONS)		DUCTILE IRON (TONS)		HARD IRON (ALL TYPES)		EXPORTS OF JOBBING CASTINGS			OUT OF PROVINCE SHIPMENTS OF JOBBING CASTINGS		
			CAPTIVE	JOBBING	CAPTIVE	JOBBING	CAPTIVE	JOBBING	G	D	HM	G	D	HM
MANITOBA	52,030	27,727	10,375	8,487	107	7,623	137	998	675	1,008	25	2,019	2,765	280
SASKATCHEWAN	4,200	2,710	769	1,461	NIL	360	NIL	120	NIL	NIL	NIL	416	72	24
ALBERTA	62,085	42,741	17,185	3,517	20,000	1,439	NIL	601	120	35	43	6,420	15,601	131
TOTAL PRAIRIES	118,315	73,178	28,329	13,465	20,107	9,422	137	1,719	795	1,043	68	-	-	-
B.C.	68,141	40,845	12,531	8,254	1,301	1,006	17,056	696	180	137	NIL	532	30	42
TOTAL WEST	186,456	114,023	40,860	21,719	21,408	10,428	17,193	2,415	975	1,180	68	-	-	-

VI - BALANCE OF DEMAND VS. SUPPLY

In all provinces the provision of hard metal irons is normally regarded as an auxiliary service of grey and/or ductile iron foundries, and normally constitutes a very small percentage of total iron production (unless it is captive production). We feel, therefore, that a foundry set up purely to supply jobbing castings of the hard irons would be totally unrealistic, and we will confine our analysis and discussions to grey iron and ductile iron, the market for malleable iron also being negligible.

As a necessary prelude to determining the balance of supply and demand in the West, it is first necessary to determine the indigenous provincial supply of the various irons involved. For this purpose, we define the indigenous provincial supply as local net jobbing production (in tons) of a given iron, less 75% of total exports, less 75% of inter-provincial shipments destined for the Prairies or B.C. We have arbitrarily used the value of 75% of export shipments because the total value of exports derived contains some unstated proportion of captive tonnage, as do interprovincial shipments. (See Figures 4 and 5, opposite.)

In eliminating interprovincial shipments, we may thus look at each province as an autonomous market to assess self-sufficiency. However, in determining the need for new facilities, the aggregate values of indigenous Prairie supply must include interprovincial shipments in order to gauge the tonnage available within the total Prairie market.

(In the case of Manitoba, all exports and interprovincial shipments appear to be of jobbing castings, and hence the figures used represent 100% of such out-of-province shipments.)

Having derived provincial, Prairie, and total western indigenous supply, we may, with reference to the chart, "Current and Incremental Demand" (Figure 1), compute expected 1974 demand on the basis of expressed requirements of local industry, and relate such demand to expected tonnage available in 1974, if current levels of operations are maintained.

As far as each provincial demand tonnage is concerned, the figures do not include the requirements for municipal castings. Previous research in 1973 estimates current levels of municipal demand in B.C. of 4,000 tons of grey iron. The same research indicates that sales of municipal hydrants and valves in B.C. during 1971 were $2.64 million, while sales in the three Prairie provinces totalled $3.04 million. Since the two markets are highly related, we feel that the sales of grey iron for municipal castings in the three Prairie provinces will be in the same proportion as the two values for municipal hydrants and valves. Thus we expect that the three Prairie provinces will consume $\frac{3.04}{2.64} \times 4{,}000 = 1.152 \times 4{,}000 = 4{,}606$ tons.

This tonnage must be added to aggregate current demand to arrive at the true Prairie consumption of grey iron. Industry sources indicate that very little ductile iron is sold for municipal purposes.

Figure 6

BALANCE OF SUPPLY VS DEMAND

	GREY IRON					
	Current Demand	Incremental Demand	Expected 1974 Total Demand	Current Indigenous Supply	Inter-Provincial Shipments	Total Area Supply
Manitoba	6,187	1,921	8,108	6,467		
Saskatchewan	992	49	1,041	1,149		
Alberta	1,210	213	1,423	2,844		
All Prairie Municipal	4,606	Est. 230 (5%)	4,836			
Prairie Total	12,995	2,413	15,408	10,460	1,387	11,847
British Columbia	7,723	740	8,463	7,705	533	8,238
Total West	20,718	3,153	23,871	18,165	1,920	20,085

Total Prairie Imbalance = 3,561 Tons grey (short)
Total British Columbia Imbalance = 225 Tons grey (short)
Total Western Imbalance = 3,786 Tons grey (short)

Figure 7

	DUCTILE IRON					
	Current Demand	Incremental Demand	Expected 1974 Total Demand	Current Indigenous Supply	Inter-Provincial Shipments	Total Area Supply
Manitoba	2,611	545	3,156	3,850		
Saskatchewan	511	255	766	306		
Alberta	726	232	958	963		
Total Prairies	3,848	1,032	4,880	5,119	870	5,989
British Columbia	1,825	367	2,192	880	1,090	1,970
Total West	5,673	1,399	7,072	5,999	1,960	7,959

Total Prairie Surplus = 1,109 Tons ductile
Total British Columbia Deficit = 222 Tons ductile
Total Western Surplus = 887 Tons ductile

In projecting incremental demand for municipal castings, we expect a minimum increase in 1974 of 5%, which is considered an increment to the three Prairies in aggregate.

If the expected 1974 demand figure is then matched with current indigenous supply and interprovincial shipments, some meaningful interpretation of the adequacy of supply can be made under current production levels, and under planned future production levels.

Comparisons of current demand and current supply are made in Figures 6 and 7, opposite.

GREY IRON

The chart opposite for grey iron shows quite clearly that a serious imbalance, amounting to almost 25%, exists between Prairie demand and supply. In addition, the imbalance in B.C. is of very much less significance, as the shorter lead times available in B.C. than in the Prairies tend to confirm.

Therefore, a current shortage of 3.561 tons of grey iron exists in the three Prairie provinces, a shortage of 225 tons of grey iron exists in B.C., and the total western shortage amounts to 3,786 tons.

Total interprovincial shipments of jobbing grey iron castings, according to responses in the questionnaire, amounted to the following:

GREY IRON

All Western Interprovincial Shipments	- 1,920 Tons
B.C. Foundries to Prairie Provinces	- 291 Tons
Prairie Foundries to Other Prairie Provinces	- 1,096 Tons
Prairie Foundries to B.C.	- 533 Tons

It is readily apparent that shipments of castings from B.C. eastwards are much less than the shipments of castings from the Prairies to B.C. which is to be expected since B.C. currentlv has the highest raw material costs in the West, and the highest foundry labour rates in the world.

While we feel confident that the figures stated represent the numerical extent of the current shortage, it is without doubt that they cannot show the qualitative aspects of the shortage, and its impact upon individual subsectors of demand.

To be more precise, the figures relate total demand to total supply of grey iron castings, but do not differentiate between the levels of quality of output versus demand for those same levels. Thus, consumers of relatively low quality castings do not face the same degree of difficulty that consumers of higher quality castings are encountering, simply because they are not required to reject significant percentages of delivered castings.

We feel, therefore, that although the degree of shortage would appear uniform across a given provincial market, the real effects of

such a shortage are much more critical to the users of high quality castings, because they are forced to purchase from suppliers whose quality may be considered marginal merely to obtain enough castings to operate. Moreover, in accepting these castings, with subsequently higher scrap rates, internal rectification costs increase, in turn increasing the real cost of their end product. This must result in decreased efficiency and profitability.

We would not expect these problems to be encountered to the same degree, for example, by purchasers of counterweights or municipal castings.

These observations tend to be confirmed by the large manufacturers of valves, agricultural equipment, and hydraulic components, particularly with previous mentioned scrap rates of up to 40%.

Consequently, any addition to grey iron production in the Prairies or B.C. should logically be directed to a small to medium weight range, medium to high quantity, and higher than average quality sector of demand.

DUCTILE IRON

Figure 7 for ductile iron shows unexpectedly that Prairie capacity exceeds demand, in spite of exhaustive cross-checking of production figures. Moreover, this surplus occurs in Manitoba, where the situation appears to be most critical, and the apparent Manitoba surplus has the effect of showing the whole West to be in surplus after the inclusion of interprovincial shipments, which cannot be true.

Therefore, understatement of demand, coupled with probable understatement of exports by foundries accounts for the total discrepancy between demand and supply.

The derived figures show a total prairie surplus in ductile iron of 1,109 tons, a B.C. deficit of 222 tons, and a total western surplus of 887 tons.

On the basis of the reported figures, interprovincial shipments of ductile iron were as follows:

Ductile Iron

All Western Interprovincial Shipments	- 1,960 Tons
B.C. Foundries to Prairie Provinces	- 30 Tons
Prairie Foundries to Other Prairie Provinces	- 840 Tons
Prairie Foundries to B.C.	- 1,090 Tons

It is clear that B.C. foundries ship negligible amounts of ductile iron from West to East, but, more importantly, more than 50% of all western interprovincial shipments travel from the Prairies to B.C. Again, this is to be expected given the labour and raw material costs in B.C.

VII - EXPANSION PLANS

Current expansion plans throughout the western foundry industry range from investments in material handling equipment to completely new facilities. In addition, awareness of the degree of the current shortage is such that some purchasers of castings are actually investigating the possibility of erecting their own foundries. In one specific case, plans have proceeded to the point of specifying actual tonnages and equipment.

The current plans of existing foundries to expand production are as follows:

Manitoba

Five established ferrous foundries in Manitoba have expressed plans to expand their capacity in iron castings, and one casting consumer is drawing up plans for a new foundry.

Plans which are firm, and for which equipment has already been ordered, should lead to additional capacity for approximately 3,700 tons of grey iron and 2,300 tons of ductile. In addition, 500 tons of grey iron capacity, 107 tons of ductile capacity, and 107 tons of hard iron capacity expansion looks highly likely, and 8,000 tons of grey iron and 2,000 tons of ductile iron additional capacity must be considered as an outside possibility. When referring to additions in capacity, the figure quoted relates to net tonnage of finished castings.

The firm commitment for grey iron capacity expansion does not include capacity to use for captive production, but the figure of 3,700 tons could be reduced if need for captive castings increases sharply.

The firm expansion plans for both grey and ductile irons are by reputable, financially stable companies of recognized technical skill, and hence are expected to assist materially in eradicating the shortage of castings within the province, particularly in the high quality area.

The high probability expansion plans for 500 tons grey, 107 tons ductile, 107 tons hard iron are also being laid by a financially sound company, but will probably be aimed at the higher unit weight, low quality segment.

The 8,000 tons of grey iron and 2,000 tons of ductile iron would be installed by a current consumer. Although this figure includes a large requirement for captive production, it would nevertheless liberate an equivalent amount of jobbing capacity elsewhere, and may therefore be considered a net gain to provincial jobbing capacity. In this particular case, the availability of finance may prove to be a real impediment, and moreover, as the company is not an established foundry, real difficulties may also be encountered in recruiting labour and obtaining raw materials, which must be considered a serious impediment under current conditions.

We conclude, therefore, that current expansion plans in Manitoba will be more than adequate to ensure the supply of all types of iron castings within that province for the near to medium term.

Saskatchewan

Two of the three ferrous foundries in Saskatchewan have expressed expansion plans for 1974 and 1975, which could increase supply by 900 tons grey iron in 1974, and an unspecified amount in 1975. If these plans mature, the Saskatchewan demand for grey iron in 1974 may be expected to be met from local production, at least in relation to relatively low quality castings. It is probable that local production will not be able to meet local demand for high quality castings.

One of the local foundries must move, resulting in a definite demand for expansion. However, the 1975 capacity expansion will be predicated by market conditions in the latter half of 1974.

As previously mentioned, one of the three foundries is captive, and is therefore highly unlikely to sell significant amounts of castings to the primary user of the province, as the foundry parent company is in a competing line of business. The other foundries produce primarily for the municipal and low quality segments, and are also, therefore, unlikely to sell significant amounts of castings to the same buyer.

We therefore conclude that of all four western provinces, Saskatchewan must be considered the better location for a new entrant to the foundry industry for grey iron or ductile, given a high quality

product, and especially in view of the tenuous hold of local foundries and the apparent low level of customer satisfaction with their products.

Two local consumers of castings are considering erecting their own foundries, but their plans do not appear to constitute a firm commitment, nor do detailed plans appear to exist. We, therefore, consider these cases to have low probability of completion.

Alberta

Only one Alberta foundry appears to have any plans to increase capacity in iron production in 1974, while one appears to be planning increased efficiency measures in 1975 and another a new foundry. On the assumption that the types of iron poured in the new capacity would be in the same proportion as current production, this 1974 increase could be expected to produce an extra 89 tons of grey, 140 tons of ductile, and 25 tons of hard iron.

The figures for expected 1974 total demand and current indigenous supply indicate that the province has adequate capacity for grey iron now, and will continue in this state through 1974, if demand remains at projected levels. (See Figure 6.) However, if oilfield activity increases sharply (as expected), then the current level of excess supply at 1,400 tons or 100% of demand could be expected to decrease quite sharply, since 1,400 tons of grey iron jobbing production is not considered very large.

However, the expected increase in ductile production is only marginal, and from Figure 7 demand and supply should be in balance over 1974 purely on a quantitative basis.

This statement, however, oversimplifies the problems of supply, because the nature of the supply problem is unstated, and again, a principal producer of ductile iron appears to have total capacity committed throughout 1974 and well into 1975.

Consequently, we feel that a Saskatchewan foundry pouring high quality ductile iron would encounter significant opportunities to supply Alberta consumers over the years 1974 and 1975.

British Columbia

Within the province of British Columbia, nine foundries are planning to increase output, either by increased efficiency or new melting facilities. One foundry is planning to cease operation in 1974.

The net amount of the increases, the plans for which appear reasonably firm, indicate that an additional 490 tons grey iron, 337 tons of ductile, and 28 tons of hard metal capacity will come in stream. In addition, the possibility of a large increase in ductile iron (not quantified) during 1974 by a major producer, and 500 tons of new production by 1975, (unspecified as to mix of irons) would leave the province marginally short of grey iron on a quantitative bases in 1974 and 1975, and probably seriously short of ductile iron. (See Figures 6 and 7.)

From the apparent inability of local suppliers to pour high quality castings for local consumers, and the current volumes of castings being sold from the Prairie provinces into B.C., it would appear that a Saskatchewan-based foundry could enjoy sales in the B.C. market in both grey and ductile iron.

APPENDIX A

FOUNDRY QUESTIONNAIRE

FOUNDRY QUESTIONNAIRE

1. What types of metal do you pour?

   What tonnages at capacity?

   How do you see these changing in 1974 and 1975?

   By what percent?

2. What types of steel do you pour, and what % of total steel production is each?

3. What types of iron do you pour, and what % of total iron production is each?

4. By type, what is the price range of each?

5. By type, what production quantities do you pour?

		0-50	50-100	100-500	500-1,000	1,000+
Iron	(1)					
	(2)					
Steel	(1)					
	(2)					
	(3)					
	(4)					

6. By type, what weights do you pour?

		0-10lb.	10-25lb.	25-50lb.	50-150lb.	150+lb.
Iron	(1)					
	(2)					

6. (Continued)

	0-10lb.	10-25lb.	25-50lb.	50-150lb.	150+lb.
Steel (1)					
(2)					
(3)					
(4)					

7. By type, what percentage of capacity is jobbing, and which captive?

8. By type, what is the maximum flask size you could utilize?

9. What is the weight of the heaviest casting you could comfortably pour?

10. Would you say that business is (a) Poor (b) Fair (c) Average (d) Good (e) Couldn t be better.

11. Have you undergone any recent expansion or modernization? What?

12. Are you currently doing so, or do you plan to do so? What?

13. Do you have any special areas of interest or expertise?

14. With whom do you compete, for Canadian business?

		Competitor names
(a)	B.C. Foundries %	
(b)	Foundries West of Ontario %	
(c)	Canadian foundries %	
(d)	Other foundries (U.S., Japan, Europe, etc) %	

15. Do you export castings?

Where?

Who are your Canadian competitors?

Who are your other competitors?

What percentage of production by type of metal is exported?

16. What do you feel are the major consumer industries of your castings?

17. What companies do you know that buy significant amounts of castings? By industry grouping and importance within that industry.

	Company	Industry	Importance
B.C. -			
Prairies -			
U.S. -			
Other -			

18. What percentage of (a) Local, (b) B.C., (c) Prairies, castings demand is filled from other than B.C. Saskatchewan, Manitoba, and Alberta? (In your opinion.)

To what companies and industries?

Why?

19. Do you see any new markets for castings opening up in the next 5 years? What?

20. At what percentage of capacity are you currently operating, by metal?

21. How do you sell castings - captive, direct, commission agent, other. Please specify.

22. What QC do your customers require - NDT, Batch Certification, Plant Inspection, Sampling, Chemical and Dimensional?

23. What percentage of your production is shipped?

    (a) Locally How are your castings transported?

    (b) B.C.

    (c) Prairies

    (d) Canada

    (e) Export

24. Within the last 5 years, have you lost orders or customers because they switched to (a) Non-ferrous castings, (b) Forgings, (c) Fabrication, (d) Powder Metal, (e) Plastic, (f) Other (specify)? Which?

25. Is the technical development of any of these products such as to cause you to worry about your future markets?

26. Not a question. Note state of repair, degree of automation.

27. Will Pollution controls necessitate, or has it, capital expenditures within the next 5 years?

    How much?

    To what degree are you concerned?

28. Do you plan to increase the range of metals you pour?

29. What are current lead times by metal?

APPENDIX B

CASTING CONSUMER QUESTIONNAIRE

CASTING CONSUMER QUESTIONNAIRE

1. What do you manufacture?

2. What is the value of your annual casting purchases, by metal and tonnage?

3. By metal, how much comes from captive foundries (%)?

4. By metal, what are the weights per casting that you order as percentage of total for that metal?

		0-10lb.	10-25lb.	25-50lb.	50-150lb.	150-500lb.	500+lb.
Iron	(1)						
	(2)						
Steel	(1)						
	(2)						
	(3)						
	(4)						

5. What services do you require from suppliers - delivery, M/C, testing?

6. By metal, what are your release quantities for castings?

		0-50	50-100	100-500	500-1,000	1,000+
Iron	(1)					
	(2)					
Steel	(1)					
	(2)					
	(3)					
	(4)					

7. What is the frequency of releases per year?

8. Do you purchase for plants other than this one?

   Where are they?

9. Are you actively searching for new supplier foundries?

   Why?

10. What are your foundry lead times by metal?

    Is this satisfactory?

11. Do you see prices easing or getting worse?

    What annual price rises do you expect?

12. Do you anticipate changes in the amount of castings you purchase either due to other processes or other metals? Why?

    Would you consider it likely that this company would instal or expand captive capacity?

13. In the near future, do you see any processes, metals, or materials become more competitive to castings? (fabrication, powder metal, forging, non-ferrous castings, plastics, other - what?)

14. Have you within the past 2 years, or do you plan in the near future, to make a permanent switch to another material or process in place of ferrous castings?

    What material did you switch to? Why?

15. Are you importing castings? From where? What companies? What metals? At what price range?

16. Are your foreign supplies becoming (a) more expensive, (b) harder to obtain, (c) poorer in quality?

17. Do you consider that more provincial foundry capacity is necessary? In what metals? In your opinion, who would be the most competent foundry operation in this province?

18. What are your comments with regard to service from your current casting suppliers? Are these comments true for all types of iron/steel?

19. Are you purchasing a significant number or value of iron or steel valves?

APPENDIX C

DETAILED ANALYSIS OF IRON FOUNDRY QUESTIONNAIRE

Iron Foundry	Capacity Utilization	Shifts	Total Gross Tonnage (Iron)	1973 Total Net Tonnage (Iron) At Current Utilization	Captive Grey	Jobbing Grey	Captive Ductile	Jobbing Ductile	Hard Metals & Hi-Alloy Jobbing	Hard Metals & Hi-Alloy Captive	Outside Province And Type (Tons) G D HM	Exports And Type G D HM	Expanded Production Due To Efficiency Or Capacity Increase To Use For Jobbing G D HM	
Abex	80%	2	1,150	600	NIL	NIL	NIL	NIL	570	30	240	NONE	NONE	
Man. Bridge	85%	3	6,500	3,570	500	2,000	107	428	428	107	203 40 40	250 25	500 107 107	
Prairie Fdry.	60%	1	12,000	5,040	5,040	NIL	NIL	NONE	NIL	NIL	2772(Captive)	NONE	NONE	
Contract Castings	100%	1	250	163	NONE	163	NONE	NONE	NONE	NONE	------NONE----	NONE	NONE	
Farm King	75%	1	1,330	750	562	188	NONE	NONE	NONE	NONE	113	NONE	NOT SPECIFIED	New Foundry?
Teledyne	100%	3	7,000	3,500	NONE	175	NONE	3325	NONE	NONE	1332	333	2328	
Thor	60%	1	2,400	1,080	NONE	1,080	NONE	NONE	NONE	NONE	------NONE----	-----NONE----	420	
Monarch	90%	1	4,800	3,024	2,873	151	NONE	NONE	NONE	NONE	------NONE----	150	3276	New Foundry
Anthes	80%	3	16,600	10,000	1,400	4,730	NONE	3870	NONE	NONE	1703 1393	275 675	968 792	
Manitoba	-	-	52,030	27,727	10,375	8,487	107	7623	998	137	5144 2765 280	675 1008 25	5164 3227 107	
Blanchard	100%	1	1,000	900	270	630	NIL	NIL	NIL	NIL	225 - -	-----NIL-----	900	
Norwood	55%	1	1,300	610	427	183	NIL	NIL	NIL	NIL	61	-----NIL-----	NOT SPECIFIED	
John East	33%	2	1,900	1,200	72	648	NIL	360	120	NIL	130 72 24	-----NIL-----	648 360 120	1975 Expansion
Saskatchewan	-	-	4,200	2,710	769	1,461	NIL	360	120	NIL	416 72 24	-----NIL-----	1548 360 120	
Sovereign	100%	1	3,600	2,376	1,283	855	NIL	NIL	238	NIL	107 NIL 12	107 NIL NIL	NOT SPECIFIED	
Lethbridge	85%	2	2,500	1,275	22	424	NIL	701	128	NIL	295 463 84	13 35 43	89 140 25	New fdry. 1975
Dom. Bridge	125%	1	2,725	1,875	NONE	1,594	NONE	188	94	NONE	------NONE----	-----NONE----	---------NONE---------	
General Fdry.	85%	2	8,900	4,930	4,930	NONE	NONE	NONE	NONE	NONE	------NONE----	-----NONE----	---------NONE---------	New fdry.
Anthes - Edm.	100%	1	5,360	3,750	3,750	NONE	NONE	NONE	NONE	NONE	1125(Captive)	-----NONE----	---------NONE---------	
Canron Ltd.	100%	1	38,500	25,000	5,000	NONE	20,000	NONE	NONE	NONE	3750 15000 (Captive)	-----NONE----	---------NONE---------	
Crane-McAvity	95%	1	1,800	1,230	1,230	NONE	NONE	NONE	NONE	NONE	739(Captive)	-----NONE----	---------NONE---------	
Norwood	100%	NK	3,700	2,305	970	644	NONE	550	141	NONE	404 138 35	-----NONE----	400 275 35	1975 Expansion
Alberta	-	-	62,085	42,741	17,185	3,517	20,000	1439	601	NIL	6420 15601 131	120 35 43	489 415 60	
All Prairies	-	-	118,315	73,178	28,329	13,465	20,107	9422	1,719	137		795 1043 68	7201 4002 287	
TOTAL WEST	-	-	186,456	114,023	40,860	21,719	21,408	10428	2,415	17,193		975 1180 68	8303 4321 315	

Iron Foundry	Capacity Utilization	Shifts	Total Gross Tonnage (Iron)	1973 Total Net Tonnage (Iron) At Current Utilization	Captive Grey	Jobbing Grey	Captive Ductile	Jobbing Ductile	Hard Metals & Hi-Alloy Jobbing	Hard Metals & Hi-Alloy Captive	Inside Canada But Outside B.C. & Type	Exports & Type G D HM	Expanded Production Due To Efficiency Productivity Or Capacity Increase For Jobbing G D HM
Cominco		NK	440	240	-	-	180	60	-	-	Ø	NIL	120
Letson & Burpee	75%	NK	650	300	NONE	NONE	120	120	60	-	Ø	NIL	25 12
Dobney	70%	1	5,500	2,500	2,000	500	NIL	NIL	NIL	NIL	0	NIL	500
CAE	70%	NK	1,900	740	19	55	111	333	166	56	30 30 14	44 Tons Ductile	6 34 16
Associated	60%	NK	16,666	8,000	7,600	400	NONE	NONE	NONE	NONE	NONE	NONE	NONE
Terminal City	75%	3	4,500	2,375	2,137	238	NONE	NONE	NONE	NONE	NONE	NONE	NONE
VMC	60%	NK	245	95	NONE	62	NONE	NONE	33	NONE	NONE	NONE	NONE
Victoria	50%	1	2,500	815	735	80	NONE	NONE	NONE	NONE	NONE	NONE	NONE
Nyes	100%	1 (could be 3)	400	240	NONE	120	NONE	120	NONE	NONE	NONE	NONE	30 30
Thompson	80%	1	670	288	34	52	80	120	NONE	NONE	NONE	Ductile-48 Grey-20	26 60
Century Pacific	80%	1	350	200	NONE	100	NONE	100	NONE	NONE	NONE	NONE	50 50
Cranbrook	50%	1	90	30	6	24	NONE	NONE	NONE	NONE	NONE	NONE	Closing Down
Highland	45%	2	700	250	NONE	25	NONE	63	162	NONE	NONE	NONE	New Plant Not Known
Mainland	110%	1	7,700	5,500	NONE	5,225	NONE	NONE	275	NONE	522 Tons Grey 28 Tons Ni-Hard	160 Tons Grey	New Furnace
Peach City	100%	1	580	375	NONE	375	NONE	NONE	NONE	NONE	NONE	NONE	NONE
T.E. Wright	10%	1	250	22.5	NONE	225	NONE	NONE	NONE	NONE	NONE	NONE	NONE
McLean & Powell	100%	1	1,500	975	NONE	975	NONE	NONE	NONE	NONE	NONE	NONE	490
Ocean	100%	2	21,500	17,000	NONE	NONE	NONE	NONE	NONE	17,000	Captive 850 Tons Hard	NONE	NONE
Robar	90%	2	2,000	900	NONE	NONE	810	90	NONE	NONE	Captive 630 Tons Ductile	45 Tons Ductile	NONE
B.C.	-	-	68,141	40,845	12,531	8,254	1,301	1,006	696	17,056	532 30 42 Job Job Job	180 137 -	1102 319 28

APPENDIX D

DETAILED ANALYSIS OF CURRENT AND INCREMENTAL IRON CASTING DEMAND

MANITOBA DEMAND

	CURRENT IRON (JOBBING ONLY)				INCREMENTAL IRON			
	GREY	DUCTILE	HM	OTHER	GREY	DUCTILE	HM	OTHER
Versatile	$975,000	$525,000	None	None	None	None	None	None
Allied	$ 50,000	$150,000	None	None	$ 12,500	$ 37,500	None	None
CCIL	$300,000	$100,000	None	None	$ 60,000	$ 20,000	None	None
Chicago Blower	50 Tons	5 Tons	None	None	-	-	-	-
Cancade	10 Tons	4 Tons	None	None	-	-	-	-
Markwill	$ 5,000	-	-	-	-	-	-	-
Master Metal	20 Tons	-	-	-	-	-	-	-
Grainmaster	-	3 Tons	-	-	-	-	-	-
C & J Jones	1½ Tons	13½ Tons	-	-	-	-	-	-
Inland Steel	-	$ 15,000	-	-	-	-	-	-
Simon-Day Mfg.	15 Tons	15 Tons	-	-	-	-	-	-
Quest Mfg.	30 Tons	-	-	-	-	-	-	-
Monarch Mcy.	-	$ 20,000	-	-	720 Tons+ $ 35,000	$ 20,000	-	-
Motor Coach	-	6 Tons	-	-	-	-	-	-
Flyer Ind.	$ 2,000	$ 20,000	-	-	$ 500	$ 5,000	-	-
Loewen Mfg.	$ 8,000	$ 25,000	-	-	-	$ 40,000	-	-
Kilberry Ind.	$ 60,000	$ 25,000	-	$ 10,000 Mal.	$ 6,000	$ 2,500	-	$ 1,000 Mal.
EPM Mfg.	150 Tons	-	-	-	30 Tons	-	-	-
Carter Temro	$ 20,000	-	-	-	$ 3,000	-	-	-
Metal Industries	-	1 Ton	-	-	-	-	-	-
Cdn. Tool & Die	3,500 Tons	1,500 Tons	-	-	1,050 Tons	450 Tons	-	-
Ajax Equip.	$ 14,000	$ 6,000	-	-	$ 28,000	$ 12,000	-	-
Manwest Eng.	$ 5,000	-	-	-	-	-	-	-
FPE-Pioneer	$ 3,000	$ 2,000	-	-	-	-	-	-
Farm King	-	$ 5,000	-	-	-	-	-	-
Forever Ind.	$ 4,000	-	-	-	-	-	-	-
	$1,446,000 + 3777 Tons = 6187 Tons	$893,000 + 1548 Tons = 2611 Tons	None	$ 10,000 (14 Tons)	$ 72,500 + 1800 Tons = 1921 Tons	$ 79,500 + 450 Tons = 545 Tons	None	$ 1,000

SASKATCHEWAN DEMAND

	CURRENT IRON (JOBBING ONLY)				INCREMENTAL IRON			
	GREY	DUCTILE	HM	OTHER	GREY	DUCTILE	HM	OTHER
Ram Indust.	-	-	-	-	5 Tons	20 Tons	-	-
Alwinsal Pot.	$ 500	$ 1,000	$ 1500	-	$ 2,500	$ 5,000	$ 7500	-
Sylvite	-	-	$ 1250	-	-	-	$12500	-
Allen Potash	-	-	$11000	-	-	-	$ 2200	-
Rock-O-Matic	$ 15,000	$ 15,000	-	-	-	-	-	-
Bird M/C	-	$ 10,000	-	-	-	$ 4,200	-	-
Fabco M/C	$ 1,500	$ 1,500	-	-	-	-	-	-
Industrial M/C	$ 2,000	-	-	-	-	-	-	-
Schulte Indust.	$ 20,000	$ 5,000	-	-	$ 4,000	$ 1,000	-	-
Smith-Roles	-	-	-	-	$ 10,000	-	-	-
Int. Min. & Chem.	-	-	$10000	-	-	-	-	-
Friggstad	-	$ 25,000	-	-	-	-	-	-
Anderson Mfg.	16 Tons	-	-	-	-	-	-	-
Ebadisco Mfg.	-	-	-	-	POSSIBLY V. LARGE BUT UNSPECIFIED			
Western M/C	$ 11,000	$ 1,000	-	-	$ 3,300	-	-	-
Fibro Industries	$ 3,000	$ 10,000	-	-	$ 750	$ 2,500	-	-
Inland Cement	10 Tons	-	-	-	-	-	-	-
Brandt M/C	$ 10,000	$ 6,000	-	-	-	-	-	-
Melcam Ind.	$ 3,000	$ 27,000	-	-	-	-	-	-
Rem Mfg.	-	$ 5,000	-	-	-	$ 5,000	-	-
Lenkurt	10 Tons	-	-	-	-	-	-	-
Degelman Ind.	-	$ 65,000	-	-	-	$ 19,500 $ 35,000 Cdn. Tool & Die	-	-
Morris Rod	700 Tons	280 Tons	31 T	-	-	120 Tons Cdn. Tool & Die	-	-
Misc. Small Buyers	$ 18,000 + 16 Tons	$ 3,700 + 5 Tons	NIL	NIL	$ 6,000	$ 24,000	NIL	NIL
PCA	$ 60,000	$ 10,000	$30000	NIL	-	-	-	-
Cominco	-	6 Tons	54 T.	NIL	-	-	-	-
	$114,000 + 752 Tons = 992 Tons	$185,000 + 291 Tons = 511 Tons	$53750 + 85 T. = 119 T.	NIL	$ 26,550 + 5 Tons = 49 Tons	$ 96,200 + 140 Tons = 255 Tons	$22200 = 14 T.	NIL

ALBERTA DEMAND

	CURRENT IRON (JOBBING ONLY)				INCREMENTAL IRON			
	GRAY	DUCTILE	HM		GRAY	DUCTILE	HM	OTHER
McCoy Bros.	135 Tons	20 Tons	-	-	68 Tons	10 Tons	-	-
Lufkin M/C	$100,000	-	-	-	-	-	-	-
Tracked Veh. Supply	-	$50,000	-	-	-	-	-	-
Neufeldt Industries	-	$10,000	-	-	-	-	-	-
Burnco Industries	-	-	2 Tons	-	-	-	-	-
Noble Cultivators	$10,000	$75,000	-	-	-	$15,000	-	-
Edwards Rod	-	$100,000	-	-	-	-	-	-
Foremost Devt.	-	-	-	-	-	$80,000	-	-
Canada Cement	$3,000	-	-	-	-	-	-	-
Coutts Mcy	$100,000	$11,000	-	-	$10,000	$1,100	-	-
Alberta Oil Tool	$25,000	$30,000	-	-	$6,250	$7,500	-	-
Stream-Flo Valves	$15,000	$30,000	-	-	$1,500	$3,000	-	-
Ezee-On Mfg.	$175,000	-	-	-	-	-	-	-
Texsteam	-	$55,000	-	-	-	-	-	-
Flextrack	-	$50,000	-	-	-	-	-	-
EIM Controls	$50,000	$10,000	-	-	$25,000	$5,000	-	-
FWI Cda. Ltd.	$50,000	$75,000	-	-	$20,000	$30,000	-	-
Barber Ind. Edm.	-	$29,000	-	-	-	-	-	-
Hoover Curtis	-	$32,000	-	-	-	-	-	-
Demco Inc.	$15,000	$15,000	-	-	$15,000	$15,000	-	-
Misc. Small M/C Shops	$102,000	$21,000	$11,000	$8,000 Mall	$9,250	$30,000	Nil	$1,000 Mall
	$645,000 + 135 Tons = 1210 Tons	$593,000 + 20 Tons = 726 Tons	$11,000 + 2 Tons = 9 Tons	$8,000 Mall = 7 Tons	$87,000 + 68 Tons = 213 Tons	$186,600 + 10 Tons = 232 Tons	Nil	$,1000 Mall = 20 Tons

BRITISH COLUMBIA DEMAND

	CURRENT IRON (JOBBING ONLY)				INCREMENTAL IRON			
	GRAY	DUCTILE	HM	OTHER	GRAY	DUCTILE	HM	OTHER
Bingham	$125,000	$25,000	$25,000	-	$31,250	$6,250	$6,250	-
Singer Valve	$125,000	$5,000	-	-	$31,250	$1,250	-	-
Gearmatic	204 Tons	1,674 Tons	-	-	41 Tons	335 Tons	-	-
	621 Tons x 2	1,710 Tons	16 Tons		145 Tons	344 Tons	4 Tons	1,207 Tons