August 31, 1960
Volume 15 · Number 8

Monthly Review

OF THE FEDERAL RESERVE BANK OF MINNEAPOLIS

Uneven trends mark economy

Economic activity in the nation during recent weeks has been marked by divergent signs—signs pointing both to strength and to weakness. The following discussion examines important evidence of both kinds.

Several signs of strength stand out: the record levels of Gross National Product, of personal income, of personal consumption expenditures and of new plant and equipment expenditures.

GNP for the second quarter was estimated at an annual rate of $505 billion, an increase of $3.7 billion from the first quarter. The final demand for goods and services increased more than enough to offset an annual rate of reduction of $6.1 billion in inventory accumulation.

Seasonally adjusted personal income rose each month, beginning in February, and by July reached an annual rate of $407.1 billion, a new high. These increases took place despite layoffs in the steel industry and the loss of pay resulting from labor disputes in the aircraft industry.

Personal consumption expenditures have reflected the rise in income. Retail sales in the second quarter made a strong showing, establishing a new record. In July, department store sales rose to the second highest rate on record, only 3 percent below the April peak. Although new car sales receded in July, as had been expected with the termination of sales contests, sales in the first half of this year were second only to the 1955 peak.

Expenditures for new plants and equipment

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have risen in each successive quarter during the past year. Third quarter expenditures have been estimated at a $37.5 billion annual rate, $.5 billion above the second quarter rate and over $4 billion higher than a year earlier.

At the same time, there are visible areas of weakness: a rise in unemployment, excess industrial plant capacity, a decline in new orders, and lower corporate profits. Furthermore, no strong upward thrusts in these fields appear on the horizon.

With the diminished rate of economic expansion, unemployment has been rising. The rise in employment in June and in July was not enough to compensate for the rapid expansion in the civilian labor force.

Excess plant capacity exists in nearly all industries. A reduction in capital appropriations for new plants and equipment was recently reported,[1] signaling a decline in such future expenditures, possibly by early 1961. On a seasonally adjusted basis, new orders received by manufacturers of durable goods declined in June to a new low for the year.

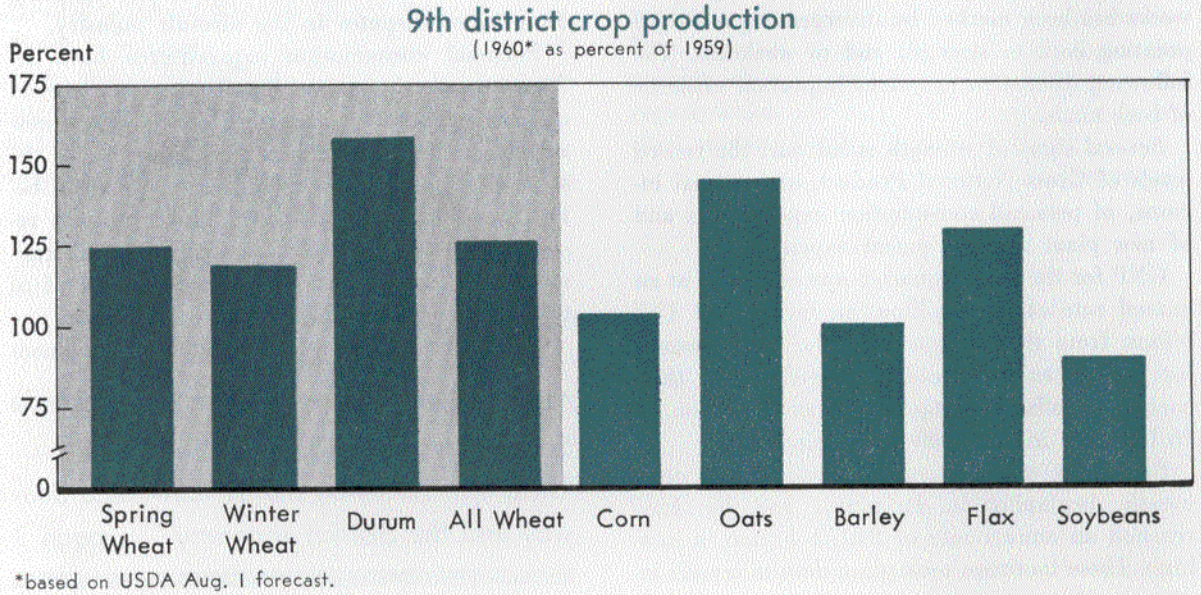
[1]National Industrial Conference Board

Although sales continued at high levels, cost increases resulted in lower corporate profits during the second quarter.

In the Ninth district there is also evidence of strength and weakness. Manufacturing employment and earnings reflect strength while declining iron ore shipments are a part of the sagging steel output.

Manufacturing employment and earnings during the first half of this year have held up better than in the nation. The source of this strength has been primarily in the durable goods sector. Industries important in this district which have maintained a relatively favorable position are electrical and nonelectrical machinery, paper and allied products and printing and publishing. Cutbacks in primary metals and transportation equipment industries, which have been significant for the national picture, play a relatively minor role in the district's economy.

The low level of steel production during the second quarter has reduced the demand for Lake Superior iron ore. Shipments in June aggregated 12 million long-tons, down one-half million tons



*based on USDA Aug. 1 forecast.

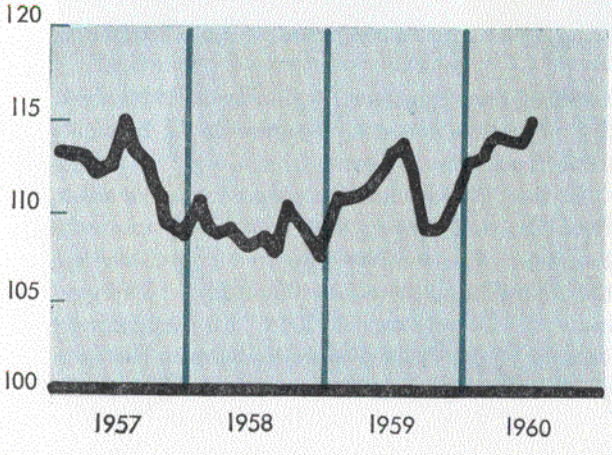
from May; July shipments were 11¼ million tons, down three-fourths of a million tons from the preceeding month. It is unusual for shipments in June and July to be lower than in May. Since World War II, early summer shipments declined only when strikes halted ore movements. Nevertheless, shipments of Lake Superior ore at the end of July aggregated 41.4 million tons, more than in the corresponding periods of the past two years.

In district agriculture, income from livestock and livestock products has risen as a result of higher prices and heavy marketings. Higher hog prices have been especially important in lifting farm incomes in southern Minnesota. However, income from the current crop will not be as high as was expected. Hot dry weather between mid-July and early August reduced the small grain crop by curtailing yields sharply in some areas and contributing to quality deterioration. Estimates indicate, however, that production will match the average of the past several years.

District income from farm marketings improved during the second quarter in Minnesota, rising 6 percent above a year earlier. In both North and South Dakota, income from marketings was still significantly below a year ago. It had risen sufficiently in Montana to surpass the 1959 total in June.

District manufacturing employment

(Seasonally adjusted; 1947-49 = 100)



The Seaway and iron ore

When the St. Lawrence Seaway opened Lake Superior ports to ocean traffic, thus extending outlets for some Ninth district agricultural and industrial products, it also helped open markets traditionally supplied by district iron ranges to foreign iron ore competition. High-grade ores from such far-flung areas as eastern Canada, Venezuela, Liberia and Sweden can now travel economically via water routes to most of the big U. S. steel-producing centers.

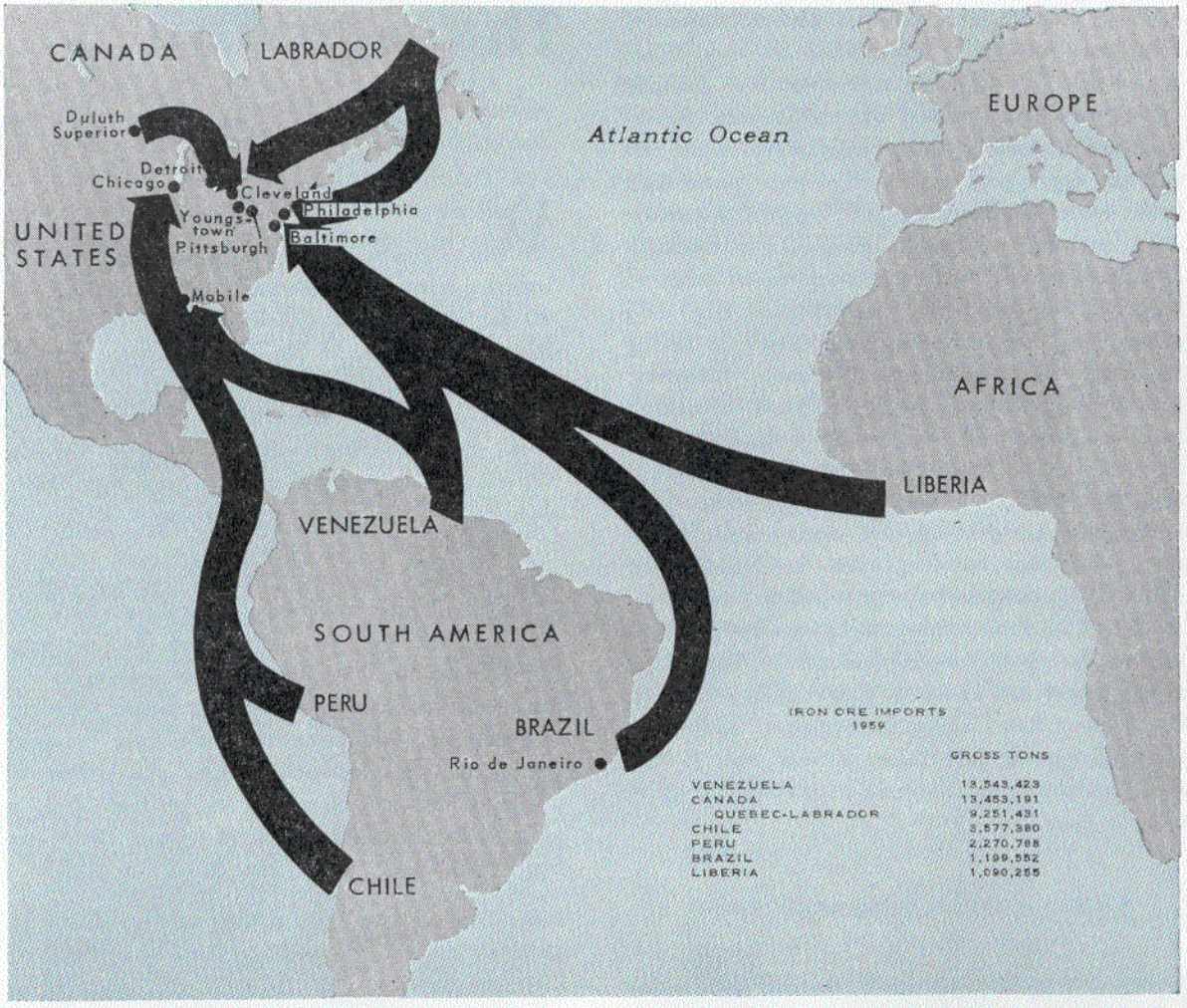
The Seaway, however, has only contributed to a process already underway—a process which has dimmed somewhat the outlook for the iron mining industry in this district. A transition in the steel industry's source of supply began with the depletion of high-grade ore in the Lake Superior region and the discovery of new and richer deposits in foreign countries. A gradual shift in geographic location of steel plants has also brought changes in the market for ore.

Lake Superior ore as a source for U. S. steel plants

The Lake Superior region continues to be an important source of iron ore to U. S. steel mills, but the proportion of the total it supplies has declined from 84 percent in 1946, just after World War II, to 56 percent in both 1958 and 1959.

The annual tonnage of ore produced and shipped from U. S. mines in this region declined after 1953 when the demand for steel created by the Korean War led to an all-time record shipment of 97 million tons. In 1955 and 1957, years of relatively high economic prosperity, 84 and 81 million tons were shipped, respectively. An economic re-

IRON ORE MOVEMENTS TO U.S. STEEL PLANTS



cession was a primary factor in reducing shipments to 51 million tons in 1958, and the 116-day steel strike in 1959 reduced the annual shipment to 43 million tons, the lowest in 20 years.

The gradual depletion of high-grade Lake Superior reserves led steel companies to explore and open new mining projects in foreign countries. The only nearby foreign ore readily accessible to steel plants adjacent to the lower Great Lakes was the small amount produced in Canadian mines north of Lake Superior. Beginning in 1956 about 2½ percent of the ore consumed in U. S. plants came from these mines.

In late 1954 initial ore shipments were made from the more inaccessible but richer mines in Labrador. The tonnage imported rose from less than 2 million tons to 8 million tons in 1957 and close to 11 million in 1959. An insignificant volume of ore from low-grade deposits has been produced in Quebec. However, facilities are now

being constructed to raise the annual production to 8 million tons of high-grade concentrate.

Important new sources of iron ore have been developed recently in South America, especially Venezuela. Prior to 1951 less than a million tons were imported annually from Venezuela, but since 1957 imports have exceeded 12 million tons per year, reaching nearly 14 million in 1959. Imports from all South American countries rose from 4 million tons in 1951 to almost 21 million in 1959.

Imports from other countries have been comparatively insignificant. Tonnage from Africa totaled slightly over 1 million annually from 1954 to 1959. European ore imports declined from over 2½ million tons in 1951 to less than 200,000 in 1959.

The demand for high quality ore

Steel companies have demanded higher quality iron ore with a superior physical structure since World War II, to cut rising costs by increasing blast furnace output. The cost of building a blast furnace has risen from $7.5 million in the late twenties to $25 million to $40 million, depending on capacity, in today's prices. The cost of labor to operate furnaces has also risen over the same period from less than 65 cents an hour to $3.39 today. These factors have made it economical to use higher priced, high-grade ores which can increase blast furnace output by as much as 20 percent. Investment in equipment per ton of finished steel as well as operating costs are thereby materially reduced.

The demand for higher quality ore has reduced the market for the low quality, such as the Lake Superior direct-shipping ores and those beneficiated by simple operations of screening, washing and sintering. Ore from Minnesota mines in 1957 averaged from 42.53 percent natural iron at the Cuyuna range to 57.32 percent at the Vermillion range. At Upper Michigan mines natural iron varied from 50.67 percent at the Menominee range to 52.87 percent at the Gogebic range. The average for all domestic ores shipped in 1957, at 51.73 percent, about equaled the 51.62 percent of natural iron in the Canadian imports.

Ores from South America, however, have a higher natural iron content than the domestic ones. In 1957 the average in imported Venezuelan ores was 59 to 60 percent. Chilean ores averaged about 61 percent and Peruvian ores 58 to 63 percent.

The Lake Superior region has large reserves of low-grade ores which can be beneficiated into a high quality ore. The two Minnesota taconite beneficiation plants and the three Upper Michigan jasperlite beneficiation plants have a combined annual capacity of about 16 million tons. Their production of iron ore pellets of superior physical structure, containing from 60 to 62 percent natural iron, has helped to keep Lake Superior ore competitive within the higher standards.

Transportation and the cost to producers

The objective of steel producers is, of course, to obtain ores which will produce steel ingots at the lowest cost.

The cost of producing iron ore at mines and of beneficiating, when necessary to upgrade it to an acceptable quality, is only part of the total cost of this raw material to steel producers. Transportation costs—freight and dock charges — range from one-third to two-thirds of the delivered price of ore at U. S. steel mills. The grade of ore, the distance of deposits from steel-producing centers and the mode of transportation are primary factors in this cost.

Since transportation costs are based on tonnage, they are less per unit of natural iron on richer than on leaner ores, as less waste material is transported. In a long ton of taconite with an analysis of 61.50 percent natural iron, for example, 20 percent more iron content is transported than in a ton of standard grade of Lake Superior ore which has 51.50 percent natural iron. In a ton of rich foreign ore with 67 percent natural iron, 30 percent more iron content is transported than in a ton of Lake Superior standard grade.

APPROXIMATE TRANSPORTATION COST OF IRON ORE FROM PRINCIPAL U.S. AND FOREIGN SOURCES TO U.S. CONSUMING CENTERS

Source of Ore	Points of Delivery: Lower Lake Ports (per long ton)	Pittsburgh
I. Lake Superior District[1]		
A. Ore from Mesabi and Vermillion ranges in Minnesota (via head of Lake Superior)	$3.75	$6.56
B. Ore from Gogebic Range in Michigan (via Ashland, Wisconsin)	3.52	6.33
C. Ore from Marquette Range in Michigan (via Marquette, Michigan)	3.16	5.97
D. Ore from Marquette and Menominee Ranges in Michigan (via Escanaba, Michigan)	3.22	6.03
II. Labrador-Quebec Ore		
A. Before Seaway was opened[2] (via Lake Erie ports)	7.02	9.76
B. After Seaway was opened[3] (via Lake Erie ports)	5.22	8.31
III. Venezuelan Ore[2] (via Baltimore or Philadelphia)	.....	10.80

[1]Compiled from rates listed in **Skillings' Mining Review**, March 19, 1960, p. 26.

[2]Based on U.S. Tariff Commission data, **Iron Ore**, Report on Investigation No. 35, Under Section 332, Tariff Act of 1930, Made Pursuant to a Resolution of the Committee on Finance, United States Senate, Washington, D. C., March 1959, Appendix Table 21.

[3]Estimated by author.

Lake Superior deposits have the geographic advantage of being relatively close to U. S. steel plants. From Labrador, where most of the Canadian ore is produced, there is a 360-mile rail haul to Seven Islands on the St. Lawrence River. From there the distance to Lake Erie ports approximately equals that from Duluth-Superior. Other principal foreign deposits are at much greater distances from U. S. consuming centers, as may be observed on the map.

Iron ore is moved to consuming centers by water wherever possible, since the cost of transporting ore per ton-mile is only one-seventh to one-fifth as much by water as by rail. Ore from Lake Superior deposits has a direct water route to ports which supply plants with roughly four-fifth of the nation's steelmaking capacity. Foreign ores, before the Seaway was opened, were shut off by high transportation costs from this consuming center.

The cost of importing ore from foreign countries other than Canada depends, in a measure, on ocean freight rates. Following the settlement of the Suez crisis, ocean rates sank below actual costs and not until the first of this year did they again firm up. Regardless of the fluctuations in ocean shipping rates, however, producers of Lake Superior ore for some time have been faced with higher per ton-mile rates than foreign producers. The carrying of cargo between American ports is restricted by law to vessels of U. S. registry. Wages of seamen on U. S. Lake fleets are from four to five times those on ocean fleets of foreign registry, and almost one and one-half times those of Canadian Lake fleets. In addition, Great Lakes ore carriers have a smaller capacity than ocean vessels; the maximum capacity is limited to about 25,000 tons, while ocean vessels carry 50,000 tons. Vessels now on the drawing boards are being designed with capacities of 60,000 and even 70,000 tons. Most Lake Superior ore is carried by a captive fleet—that is, by vessels owned by steel companies. Even though captive fleets tend to hold transportation costs below the $2 per ton listed as the going rate from Duluth-Superior to lower lake ports, the cost per ton-mile is definitely higher than on ocean vessels.

On the basis of rail and lake freight rates and

dock charges which became effective February 15, 1958, Lake Superior ore from Upper Michigan mines is delivered to lower Lake ports at $3.16 per long ton and from Minnesota mines at $3.75. Before the Seaway was opened, Labrador ore was delivered to lower Lake ports at about $7.02 per long ton. According to rates in effect for the 1960 shipping season, the opening of the Seaway has reduced the transportation cost of the Labrador ore by 25 percent, to $5.22 per long ton. The cost of transporting Lake Superior ore to lower Lake ports remains below this, but Labrador ore is of slightly higher grade, which reduces the cost in terms of natural iron content.

Before the Seaway was opened, producers of Lake Superior ore could compete with imports from eastern Canada and other foreign countries in markets as far east as Pittsburgh. The transportation cost to this market is $6 per long ton from Upper Michigan mines and $6.56 from Minnesota mines. Before the Seaway was opened, it was cheaper to ship Labrador ore to Pittsburgh by way of Baltimore or Philadelphia than through Lake Erie ports, but now the differential in costs has been reversed. The transportation costs in 1960 to Pittsburgh by way of Baltimore or Philadelphia was $8.92 per long ton, while by way of the St. Lawrence Seaway it was $8.31.

Venezuelan ore is transported to Pittsburgh at the relatively high cost of $10.80 per long ton. However, this is a rich ore which reduces the cost in terms of natural iron content. On the Atlantic coast, this ore is delivered at a comparative low cost: at Sparrows Point, Maryland, for example, at $5.53 per long ton.

Shift in ore movements due to the Seaway

The opening of the Seaway has resulted in greater competition for producers of Lake Superior ore in lower Great Lakes steelmaking centers such as Buffalo, Cleveland, Lorain, Detroit, and even in Chicago, which had been thought well within the Lake Superior market.

Shipments of iron ore through the old St. Lawrence canal system generally were less than a million tons annually, although in 1956 the tonnage exceeded 2 million. On July 4, 1958, U. S. Seaway facilities were officially opened to 14-foot draft vessels. From this date until the shipping season ended on December 16, 1.1 million tons of iron ore were shipped via this waterway.

The entire St. Lawrence Seaway was opened to vessels of 27-foot draft in April 1959. During the first year, shipments from Labrador jumped to 5 million tons of ore via this new route to U. S. ports on the Great Lakes, and to over 1 million tons to Canadian ports from the same area. As a result of the steel strike in the latter half of 1959, ore movements did not follow the usual seasonal pattern. The tonnage shipped on the new water route during the first year, therefore, may not be indicative of either the source or the volume of ore in future years.

In the first two months of the 1960 season, heavier shipments of Labrador ore to Great Lakes ports were boosting the total tonnage on the Seaway over last year. Bulk cargo upbound in April and May totaled 1.4 million tons, compared with only 820,000 tons a year ago. The movement of ore via the new water route will expand over a period of years as was anticipated on the basis of new sources developed in eastern Canada.

Changing market for ore

Plants in the historic steelmaking region located north of the Ohio River and between the Allegheny Mountains and the Mississippi constitute the primary market for Lake Superior ore. In the past three years, from 87 to 89 percent of the ore from U. S. mines in the Lake Superior region was consumed there. The annual capacity of the plants in this traditional steelmaking area, which includes Pittsburgh-Youngstown, Cleveland-Detroit, and Chicago, has continued to expand, from 65 million tons in 1946 to 99 million in 1959. However, the growth rate is lower than that of plants being built outside the traditional area, which now have a combined annual capacity of 48 million tons.

Since the end of World War II, the nation's steel plant capacity has been slowly decentralized by the building of additional capacity at a slightly faster rate on the Atlantic seaboard and in the southern and western sections of the nation than in the lower Great Lakes steelmaking region. Some steel plants have been located strategically on the Atlantic seaboard to reduce the transportation cost of imported ores from eastern Canada and South America. Furthermore, the market for steel mill products has also grown rapidly among metal fabricating establishments in those regions.

Nevertheless, the shift in capacity is still small. The annual capacity of plants in the lower Great Lakes area has slipped only from 70 percent to 67 percent of the nation's total in a decade and a half.

Some conclusions

Known reserves of relatively low-grade iron ore in the Lake Superior region are abundant. Iron ore has not become scarce as have many other minerals. Consequently, comparative costs of delivering ore to steelmaking centers will continue to determine the quantity of ore which various domestic and foreign deposits supply.

The trend of iron ore shipments in the past two decades indicates that the United States steel industry is increasingly dependent upon deposits of lower grades in the Lake Superior region which can be concentrated into a high-grade product, and upon imports from Canada and more distant countries. Steel companies in the United States have turned more and more to deposits in eastern Canada which, with the opening of the Seaway, are strategically located to serve plants from lower Great Lakes ports as well as from the Atlantic seacoast.

New steel plants built in the southern and western districts and, with few exceptions, in the eastern district, do not constitute new markets for Lake Superior ore. About a sixth of the ore consumed in U. S. iron and steel plants (20 million tons in 1957 and 15 million tons in 1958) was produced in mines from these other areas and supplied largely to local plants.

The shift taking place in iron ore movements indicates a significant rise in imports at Great Lakes ports. Much of the Labrador ore which was routed by way of east coast ports as far inland as Pittsburgh is now routed to Great Lakes ports, where it supplants Lake Superior ore. Furthermore, the volume of ores imported from South America and Africa to east coast steel plants continues to grow. The St. Lawrence Seaway opened a direct water route from foreign deposits to lower Great Lakes ports, thus reducing the transportation advantage of Lake Superior ores and increasing the competition faced by area ore producers. But at the same time, the Seaway has been a factor in preventing a more rapid geographic shift in steelmaking capacity from the region which has been and continues to be the chief market of Lake Superior iron ore.

—Oscar F. Litterer