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*Agriculture - Economic Aspects
(Pt)*

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NEW ENGLAND

AGRICULTURAL

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PROCEEDINGS JUNE 1957

AT THE
UNIVERSITY OF CONNECTICUT
STORRS CONNECTICUT

IMPACT OF THE ST. LAWRENCE WATERWAY
UPON NEW ENGLAND AGRICULTURE

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There are many who will be pleased to see that the New England Agricultural Economic Council has welcomed the assistance of our Canadian friends in discussing mutual problems. New England has greater opportunity than it may have taken advantage of for cooperating across the border. I welcome the privilege of being on this program with Dr. MacFarlane.

In approaching the topic "Impact of the St. Lawrence Waterway Upon New England Agriculture," I am assuming that Dr. MacFarlane has described the work being done to improve the St. Lawrence Waterway to a depth of 27 feet, has indicated the 7-8 month period of the year when the Waterway can be used, has pointed out that, in spite of the name "seaway," which is often applied to this project, most seagoing vessels will not be able to sail fully loaded beyond Montreal, and has discussed some of the peripheral navigation problems such as deepening of the interlake channels beyond Lake Erie and improving harbor depths and facilities. Another aspect, which Dr. MacFarlane may have touched, is the capacity of the Welland Canal. All of these points have, to my mind, an important bearing on the St. Lawrence Waterway impact on New England Agriculture.

The main theme of my discussion is that the St. Lawrence Waterway will have little impact on New England agriculture. The reasons for this conclusion are 1. the Waterway is open only for 7-8 months of the year, 2. the Waterway can not be used as economically by ocean-going ships as by lake-type ships, 3. the present Welland Canal is not capable of handling a large volume of traffic between the midwest and New England, in addition to other traffic, and 4. even without these restrictions, the probability of lower costs by water than by present rail routes is low. In order to allay my own feeling of having reached a conclusion and then presented only one side of the picture, I will try to discuss these points on a pro and con basis and to mention a few technological changes which might make the St. Lawrence a transport artery for New England.

The part-time nature of the Great Lakes - St. Lawrence route seems most likely to continue. It is true that ice breakers keep a route open across Lake Michigan. Reports from Canada indicate that it would be possible to keep the St. Lawrence River open from Montreal to the Gulf of St. Lawrence. As far as I know, however, no one has suggested that it is feasible to keep locks in operation or to use ice breakers for any extensive routes in the Great Lakes from early in December to the middle of April. A Great Lakes - St. Lawrence transport service, therefore, would either revert to rail and trucks or be dependent on stored supplies in the winter months.

The 27 foot depth limit of the St. Lawrence Waterway places a more restrictive load limit on ocean going ships than it does on lake-type ships. The reason for this is that ocean ships must be deeper for their length than lake-type ships. Ocean ships must be built to withstand large waves. The maximum load capacity of ocean-going ships in 27 feet of water is about 8,000 tons. Lake-type ships can carry up to 25,000 tons in the same depths. Less

than 10 percent of United States registry ocean-going ships could use the St. Lawrence Waterway when fully loaded. All movements of cargo between two United States ports must be in United States registry ships.

There is a possibility that foreign registry ships could bring cargo from Canadian lake ports to United States seaboard ports. In addition, lake-type ships might bring cargo to Montreal and transfer it to ocean ships. In this transfer a means might be found to circumvent the law requiring use of United States registry ships, whose rates are higher than those of foreign registry ships, for domestic commerce. I would seriously question the probability that United States producers would forego the opportunity of invoking tariffs to keep from losing their market to Canadian producers. A combination lake and ocean ship service would double handling charges and tax handling facilities at Montreal or other lower St. Lawrence ports. In general, the most likely water service, if there is to be one between lake ports and New England ports, would be in ocean-going United States registry, 8,000 ton ships.

Estimates of the two-way capacity of the Welland Canal range from 35 million tons to 150 million tons. The low estimate was made by a spokesman for the Association of American Railroads. The high estimate is theoretical. It is based on the assumption of 6,000 passages a season by ships which each carry 25,000 tons per passage.

The practical top number of passages through the Welland in one season is under 6,000. The average load of larger lake ships has been about 9,000 tons. About 40 percent of what has been moving through the Welland Canal was carried in ships of under 3,000 tons capacity. Two of these small ships can be locked through together. Using these data and simple arithmetic the capacity of the Welland turns out to be about 46 million tons. This is also the estimate made by Canadian authorities who have studied the capacity of the Welland Canal.

Since this capacity figure is for two-way traffic, the one-way capacity is 23 million tons. The present downbound movements through the Welland are about 17-18 million tons or over 70 percent of capacity. The President of the Canada Steamship Lines has said that delays at the Welland already cost his company a quarter of a million dollars a year.

There were in 1955 about 2 million tons of grain and coal which bypassed the Welland Canal before moving down the St. Lawrence River. With the enlargement of the St. Lawrence, large ships will be able to move directly from grain and coal sources to Montreal or below without transferring to the present small St. Lawrence canal ships. Thus, the present bypassing of the Welland, which goes on because transfer of shipments or use of small ships from source is necessary, may be eliminated.

There is also a probability that more coal and grain may move to lower St. Lawrence ports when the St. Lawrence Waterway is improved. These increased shipments would arise at points requiring passage through the Welland Canal. Many United States lake ports, which can only be reached after passing the Welland, are anticipating material increases in direct overseas trade. All of these things, to the extent that they occur, will add to the congestion which already appears at the Welland Canal.

On the other hand, to the extent that ocean-going ships of 8,000 tons capacity replace present smaller ocean-going ships, that canal ships of 3,000 tons or less are eliminated, that the average size of lake ships is raised above its present 10,000 ton level, and that traffic control in the Welland Canal can speed passage through the locks, the "capacity" of the Welland Canal may increase. However, concurrent with this change there may well be an increase in demands for space to carry present cargoes, as the economies of both Canada and the United States grow. Even the more optimistic estimators of capacity for the Welland Canal foresee that the Welland Canal may be a bottleneck. The solution to this problem rests primarily in twinning the five single locks of the Welland system. The cost to Canada for this work, since the Welland is entirely within Canada, is estimated at about 150 million dollars or about half as much as is now being spent by both Canada and the United States for improving the St. Lawrence Waterway.

A possible level of costs for water service can be estimated from data for similar operations. Grain is an ideal commodity for shipment on this route. It is well suited to water transport, and about 2.5 million tons are received in New England alone each year.

But grain shipments alone may not be profitable. Normally, higher value per pound cargo is expected to bear a proportion of cost greater than its proportionate contribution to the total weight of cargo. However, regularly scheduled intracoastal and Great Lakes general cargo steamship service has experienced an extreme drop in volume during the last 10 years. If this service is not being maintained along the coast or within the Great Lakes, there is no substantial basis to expect a service will develop from the Great Lakes to Atlantic coast ports. This route is much more circuitous, relative to the Atlantic coast. Thus, if the service is to come into being, it may have to prove profitable for some bulk cargo like grain.

Only an ocean-going type ship could operate between Chicago and Boston. The estimated per day cost of operating a United States registry, 8,000 ton ship would be about \$3,400. This includes tolls and other canal fees on the Seaway route, port charges, pilotage and insurance, as well as ship depreciation, repairs, fuel, crew wages, stores and supplies, and overhead. It does not include cargo loading and unloading. Subsidies do not enter into this estimate. Subsidies are paid to United States shipping lines to enable them to compete with foreign registry shipping lines.

The estimated time required for a one-way trip for this ship is 14 days. This allows for sailing time at 14 knots, reduced speeds in restricted channels, delays in locks, loading, and unloading. The cost per 100 pounds from Chicago to Boston would be 30 cents on the basis of these estimates; 8,000 tons per trip, \$3,400 a day for ship operation and 14 days per trip. Another cost would be loading and unloading the ship. Including weighing and inspection, this operation would cost about 8.5 cents per hundred pounds.

Finally, a local transportation charge would have to be paid from Boston to markets in New England. This is an added cost, since the rail rate from Chicago to Boston applies to all points in New England except northern Maine. The lowest local rate in New England using Brattleboro, Vermont, as an origin, is 14 cents per hundred pounds to nearby points.

The total of all these per hundred pound costs (30 cents for ship operation, 8.5 cents for loading and unloading, and 14 cents for local transport, or 52.5 cents) is 4 cents higher than the present "proportional" rail rate of 48.5 cents per 100 pounds from Chicago to Boston.

The cost estimate for ship operation might be materially reduced using old ships or ships with larger carrying capacity. However, costs have been calculated on only a one-way voyage. If this service were to come into being, some cargo will have to be found to bear the cost of the return voyage. New England does not offer such cargo. Iron ore might be picked up at Seven Islands, but an ocean-going ship of 8,000 tons would not be able to cover its full cost of operation. The rates for this service would be lowered by competition from larger lake-type ships which could operate from Seven Islands into the Great Lakes.

Even with a saving in transportation costs, a water service would not integrate storage and processing of grain over as wide an area as rail service. In the movement of grains from the West and Midwest to consuming centers in the East, numerous facilities have been built along rail routes. Storage, milling, and mixing "in transit" are privileges offered by the railroads. Through rates are paid for transportation while products change form and are brought together from many areas. Many milling and mixing facilities are located between Chicago and Boston.

Supply would be a problem in winter, when the Great Lakes are frozen. Transportation would have to revert to rail transport or large storage facilities would have to be provided in the East.

Although physical restrictions and the estimated cost of an inter-regional transport service indicate, for me at least, that the St. Lawrence Waterway will have little impact on New England agriculture, I do not profess to have covered all transport possibilities. Furthermore, there are non-transport impacts, which have been neglected entirely.

There has been agitation in Maine for the building of a road from Arrostook County to the St. Lawrence Waterway so that potatoes could move more cheaply to the Buffalo, Cleveland and Detroit area. Because of the winter shut-down, I have not felt that this possibility has a reasonable probability of success. I have seen no estimated costs and returns for this enterprise.

In Vermont, interest in improving the Richelieu River connection from Lake Champlain to the St. Lawrence River has been increasing. In 1955, Canada used this canal to move about 40,000 tons of fertilizer within her own borders and 26,000 tons of newsprint paper to the United States. The United States shipped about 22,000 tons of mixed cargoes to Canada. If water movement of grain to Vermont was contemplated, it would have to be more successful than Ogdensburg, New York. Ogdensburg is on deep water and has a waterfront grain elevator owned by the Rutland railroad. The use made of the elevator is for storage of surplus grain. Another relatively unsuccessful water route is the Erie Canal across New York State.

Other possible transport developments include larger ocean-going vessels designed especially for the 27 foot waterway, loading and unloading improvements, and ships to carry loaded trucks. One shipper reported that he was trying to get plans approved for ocean-going ships which would carry 15,000 to 16,000 tons in 27 feet of water. This may occur. Many shipping lines are investigating palletized and special container cargo handling for ships. This would reduce loading and unloading costs. Ships to carry loaded trucks have been proposed for Atlantic coast movement and might be a possibility for the Great Lakes route.

Among possible non-transport impacts of the St. Lawrence projects are power for Vermont, industrialization changes in New England, and decreased milk production in the St. Lawrence counties of New York State. Vermont has contracted for 100,000 k.w. of Barnhart Island power capacity. Even though this power will cost Vermont about 6 mills per k.w.h. less than present power, little reduction in price to consumers is anticipated. No measurable changes in New England industrialization are anticipated which could be attributed to the St. Lawrence Waterway. The increase in power available to the St. Lawrence counties in New York State may reduce milk production (farmers going to work in industry) but the probability of less milk may be low.

The essentially negative conclusions of this analysis should not be construed as being representative for the entire St. Lawrence River Projects. Dr. MacFarlane's analysis, I feel quite sure, revealed positive impacts for Canadian agriculture. Dr. Hartley of Indiana University anticipates that about half of the United States' exports of wheat will move directly by water from Great Lakes ports. Fertilizers may move inland by way of the St. Lawrence. However, in my mind, the major United States impact of the St. Lawrence Waterway will be to retard the shift of the steel industry from the region below Lake Erie to Atlantic coast areas. This shift was started in order to utilize foreign iron ore and to produce steel closer to many markets. Another important impact will arise from the development of power for Upper New York State which will increase industrialization in that area. I feel that the decision to carry out the St. Lawrence power and waterway projects was a wise one.