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T. C. KEEFER AND THE DEVELOPMENT OF CANADIAN TRANSPORTATION

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I

The middle period of the nineteenth century was, on the whole, a time of buoyant optimism for Upper and Lower Canada. Temporary adversity might check the flood of Canadian economic development or threaten the province with political disaster. The depression of the late forties might disrupt Canadian commerce, wily Americans might remain always one jump ahead in the struggle to secure western trade; strained relations with the United States during the Civil War might menace Canadian security. Yet throughout the period, sustaining and bearing up the Canadians through every trial, was the conviction that immense and inevitable prosperity lay just ahead. Beyond Chicago, they constantly assured themselves, was being developed a huge grain and meat-producing area, the produce of which must soon choke all available American lines of communication eastward and be diverted in immense quantities over the Canadian routes as well. And so a whole generation of Merritts, Galts, and Hinds proclaimed the glad tidings that Canada had but to develop its transportation facilities in order to secure an ample reward. Of this noble company Thomas Coltrin Keefer, during his early career, was a distinguished representative.

Before I make an analysis of Keefer as a transportation theorist, a short biographical sketch is essential. He came of Loyalist stock, his grandfather having sacrificed two farms and a distillery to fight for the British connection and his father, George Keefer, having emigrated to Thorold in the Niagara Peninsula in 1792. Thomas Keefer was born in 1821 and began his career as an engineer on the Erie Canal in 1838. Later he became a division engineer on the Welland Canal. From 1845 to 1848, as chief engineer of the Ottawa River works, his principal task was to facilitate the immense timber trade of the river and its tributaries.

Having been dismissed as a result of the change of government in Canada in 1847, Keefer entered upon the most significant period of his career. During the next fifteen years his advice was sought in connection with almost every engineering project of importance in Canada. Of even greater significance, from our point of view, was the fact that during this period Keefer produced the series of brilliant pamphlets, concerned chiefly with transportation by canal and railway, which comprise his principal contribution to Canadian economic thought. *The Philosophy of Railroads* was written in 1849, *The Canals of Canada* in 1850, the essays on "*Montreal*" and "*The Ottawa*" in 1853 and 1854, and Keefer's section on "Travel and Transportation" in H. Y. Hind's *Eighty Years Progress of British North America* in 1863.

In 1850-1 Keefer served under W. H. Merritt in the Canadian Department of Public Works. In 1851, after leaving the Department, Keefer performed the preliminary surveys, between Toronto and Montreal,

for what afterwards became the Grand Trunk Railroad. From 1849 to 1853, as a result of Merritt's influence, Keefer was closely associated with I. D. Andrews in the preparation of his reports on trade between the United States and the British American provinces. Like most of Andrews's associates, he emerged from the collaboration, rich in knowledge, but poorer in pocket. In 1853 Keefer was made Montreal Harbour Commissioner. During the later fifties and the sixties he was engaged chiefly in engineering projects, including the construction of water works at Montreal, Hamilton, and Ottawa. During the latter part of his lengthy career Keefer achieved the position of Grand Old Man of Canadian engineers and honours were heaped upon him: He was president of the Canadian Society of Civil Engineers in 1887 and 1897, president of the American Society of Civil Engineers in 1888, fellow of the Royal Society of Canada in 1891, its president in 1898, and in 1912 an honorary member of the Institute of Civil Engineers of Great Britain. He died in 1915.¹

II

The great central theme of Keefer's writing was the age-long struggle between the St. Lawrence and eastern American lines of transportation for control of the western trade. His greatest efforts were calculated to reinforce the natural advantages of the St. Lawrence by the necessary public works; and thus to enable it to capture a greater and greater portion of eastern continental, as well as of overseas trade.

Keefer believed that the Almighty, with a due regard for the theories of Mr Bentham, had located the St. Lawrence in such a way as to promote "the greatest happiness of the greatest number."² This was partly because of the directness of communication which it provided with England. Keefer laid great emphasis upon the fact that the line of navigation between Liverpool and Quebec was considerably shorter than that between Liverpool and New York. Moreover he took great pains to correct the erroneous impression created by maps drawn on Mercator's projection, which made the St. Lawrence route appear as a wide detour. This impression, he pointed out, arose from the fact, that longitudinal lines on a plane map are drawn parallel, whereas in reality every degree of longitude contains a lesser number of miles as we approach the poles. Canada, he said, had suffered not a little in the eyes of the world from the conception of Mercator.³ In order to correct this impression Keefer, in 1855, produced a map of eastern North America. He adopted the brilliant device (recently employed by a distinguished Canadian historian) of tilting the map, in order to indicate the directness of the St. Lawrence route.

¹For biographical material on Keefer, I have used *Transactions of the Royal Society of Canada*, 1915-16, IX, section 3, xi-xii; G. M. Rose, *Cyclopedia of Canadian Biography* (Toronto, 1886); W. S. Wallace, *Dictionary of Canadian Biography* (Toronto, 1927); and an unpublished M.A. thesis on Keefer by Mr Carlton Barlow of Columbia University.

²T. C. Keefer, *The Canals of Canada, Their Prospects and Influence* (Toronto, 1850), 8.

³*Ibid.*, 65-9. H. Y. Hind, T. C. Keefer, etc., *The Dominion of Canada* (Toronto, 1867), Keefer, "Travel and Transportation," 130. Originally this volume was printed in 1863 under the title *Eighty Years Progress of British North America*.

Not only did Keefer see advantage in the location of the St. Lawrence; he maintained that the nature of navigation on the upper river, a beneficial distribution of rapids and lakes, made possible speedy transit downstream and a lesser use of canals in the up trip than would have been necessitated by the existence of continuous rapids.⁴ He contended, also, that navigation in the gulf was much less precarious than had frequently been asserted. Improved aids to navigation in the form of lighthouses and a less foolhardy activity by traders in the early spring, would immensely reduce the number of marine disasters and cut down the insurance rates which discriminated seriously against Quebec and Montreal.⁵

Keefer was supremely confident that Canada could profit from the immense development of the Middle West, providing the natural advantages of the St. Lawrence were reinforced by public works and a fiscal policy calculated to encourage the development of commerce. The products of the great central plain, he asserted, might descend to tide-water by three alternative routes: the Mississippi, the St. Lawrence, and the eastern American route. The choice of route would depend upon such factors as time, expense, and the character of the routes.⁶

Natural factors combined with judicious policy, Keefer felt, could give the St. Lawrence an advantage on each of these counts. Not all of this immense seaward trade would be destined for Europe. Keefer anticipated that the British demand for American wheat and flour would decline, in view of increased supplies from the continent, but that the American export of Indian corn to Europe would vastly increase. He anticipated, however, an increasing demand for western produce on the Atlantic seaboard and this trade he proposed to capture for the St. Lawrence route by construction of the Champlain Canal connecting with the Hudson River and New York.⁷ In addition, he anticipated a considerable development of trade by way of the St. Lawrence with the lower provinces and with the West Indies.⁸ Keefer predicted increasing shipments of lumber and timber to Europe by way of the St. Lawrence. Moreover, with the decrease of timber in the Michigan region and the increased demand from the American Middle West, he anticipated a large up-going trade from the Ottawa and eastern Canada to the West by way of the St. Lawrence Canals.⁹

The greatest rival of the St. Lawrence route was, of course, the Erie Canal, first completed in 1825 and enlarged in 1851. Keefer was able in 1850 to suggest many reasons why the St. Lawrence could successfully compete with the Erie, such as the height of freight rates, the tolls on the Erie and its limited capacity. Always at the back of his mind was the encouraging thought that even if the St. Lawrence could not actually deprive the Erie of trade, there would still be plenty to go round. "By what route are all these millions of tons to find their way to the seaboard?" he asked, in regard to western produce. "They will block up the enlarged and re-enlarged excavations,—they will ground upon the shallow tributaries of the Ohio—they will blockade the narrow outlet of the Mississippi at

⁴Keefer, *Canals of Canada*, 57-8.

⁵*Ibid.*, 61-3.

⁶*Ibid.*, 86-8.

⁷*Ibid.*, 81-2, 99.

⁸*Ibid.*, 72-6.

⁹*Ibid.*, 69-70.

New Orleans, and then they *must* overflow; . . . And can any one believe . . . that a respectable portion of the great trade thus directed, will not *exude* through the Gulf of St. Lawrence?"¹⁰

I have described Keefer's optimism in regard to the future trade of the St. Lawrence. I now proceed to a fuller discussion of the actual measures which he proposed to facilitate its development. The St. Lawrence Canals had been completed in 1848. But Keefer urged the advantage of rendering the upper part of the river navigable throughout, so that down-coming freight vessels would be able to keep to the rapids. Keefer, therefore, kept hammering away at the necessity of constant dredging operations. Adoption of this course of action, he said, would double the capacity of the river, treble the speed of descending cargoes, and afford two or three additional trips between the lakes and tide-water.¹¹ In addition, Keefer insisted on the vital necessity of dredging and improving Lake St. Peter if Montreal were to retain the *entrepôt* trade between the lower St. Lawrence and the lakes.¹² But Keefer's greatest emphasis was laid upon the necessity of constructing an enlarged canal to connect the St. Lawrence with Lake Champlain. Two small canals had been completed on the Richelieu by 1843. Keefer argued that the construction of an enlarged canal from the St. Lawrence to St. Johns on the Richelieu would eventually secure access to the Hudson River for shipping from the St. Lawrence. He argued that breadstuffs, having followed the St. Lawrence-Lake Champlain route, would be shipped from Burlington, Vermont, to New England by railroad and that in order to meet the competition of Boston, New York would be compelled to connect Lake Champlain and the Hudson by canal. No longer would such a proportion of the western trade be diverted to the American route at Buffalo or Oswego. Instead it would continue by the cheaper and quicker St. Lawrence and Lake Champlain route to New England and New York.¹³ Montreal would then develop a great *entrepôt* trade between the West and New York, New England, and the overseas market. Keefer's insistence on the vital necessity of the Champlain project may be gathered from this statement: "We look upon this canal as a matter of greater importance to us than any measure which can be adopted, either for the interests of our agriculture or our treasury, and trust no effort will be spared to bring it into speedy operation."¹⁴

In addition to a vigorous policy of public works, Keefer also reiterated that Canada must adopt a customs policy which would foster the trade of the St. Lawrence to the fullest extent. He repeatedly warned Montreal against the folly of choking the through trade by the imposition of differential duties calculated to secure for itself a monopoly of the Upper Canada

¹⁰*Ibid.*, 96-97, 99-102.

¹¹*Journals of the Legislative Assembly, Province of Canada*, appendix T, sub-appendix C, T. C. Keefer, "Report on the Survey of the Rapids of the River St. Lawrence"; Keefer, *Canals of Canada*, 56; "Travel and Transportation," 161, 168.

¹²T. C. Keefer, *Report on Dredging in Lake St. Peter and on the Improvement of the River St. Lawrence between Montreal and Quebec* (Montreal, 1855).

¹³Keefer, "Travel and Transportation," 131, 151, 168-9, 184-5; *Canals of Canada*, 51-5, 96; "Montreal" and "The Ottawa" (Lectures delivered before the Mechanics' Institute of Montreal; Montreal, 1855), 20-3; Keefer, *Canada Waterways from the Great Lakes to the Atlantic* (Worlds Columbia Water Congress, Chicago, 1893, Boston, 1893), 4, 9-10.

¹⁴Keefer, *Canals of Canada*, 53; "Montreal" and "The Ottawa," 21.

trade. Furthermore, he advocated the unrestricted opening of navigation, both in the lower and upper St. Lawrence, to the shipping of all nations. In regard to the principle of protection, Keefer professed his opposition to a policy of "general protection," which, he maintained, would cripple the St. Lawrence trade before it had really developed. This appears to have meant that he was opposed to protection upon agricultural produce. Encouragement to native industry, when judiciously directed, he maintained, was not incompatible with the necessary freedom of commercial intercourse. It must be admitted that the extent of the protection which Keefer was prepared to countenance looks like the National Policy in embryo.¹⁵

Concerned as he was with the development of the Canadian inland water system, Keefer faced the problem of the developing struggle between canals and railways. Nor did he minimize the seriousness of railway competition. Keefer frankly admitted that the railways possessed many advantages over canals. The belief was general, he admitted, that railways were more expeditious and safer. For this reason he felt that shippers of flour at the height of the season, in November, would prefer to ship, for instance, by the Ogdensburg-Lake Champlain railroad in preference to the Lake Champlain water route because of the danger of an early freeze-up on the canal. This disadvantage, he felt, would not operate against the down-trade on the St. Lawrence, since the season would be longer for vessels descending the river via the rapids. Yet Keefer maintained that in the transport of grain in bulk, lumber, and other cheap and bulky articles the railways would scarcely attempt competition with any water communication "of good capacity."¹⁶ He admitted, however, that the railways could serve as a useful supplement to waterway systems. Thus, during seasons when the St. Lawrence was closed, the Portland-Montreal railway would provide a valuable winter outlet, he asserted in 1849, particularly if it were carried back to Prescott or Kingston. It was a mistake, he maintained, to believe that railways would never carry goods by the side of water communication, particularly in winter months. But he never believed that railroads would in great measure supersede the canals in carrying bulky produce to the sea.¹⁷

III

Keefer's belief in the necessity of railway construction was indeed somewhat different from the boundless enthusiasm which he had bestowed on projects of waterway development. To be sure even Keefer's enthusiasm must have had some limits and his fervent prophecies of boundless waterway traffic may have left him somewhat winded. At any rate, he showed marked restraint in predicting that Canadian railways would profit to any great extent from through traffic between the Middle West and Europe. Canadians must not build railways with the idea that their principal source

¹⁵Keefer, *Canals of Canada*, 33-42, 48-9, 85-6; "Montreal" and "The Ottawa," 23-7, 30.

¹⁶Keefer, *Report on Rapids of St. Lawrence*.

¹⁷Keefer, *Philosophy of Railroads* (Montreal, 1850), 13-14; "Travel and Transportation," 161.

of profit would be the "through" traffic. Keefer considered all roads depending chiefly upon "through" traffic to be inferior investments.¹⁸

On the whole, Keefer's advocacy of railroads in Canada was based on other considerations. He admitted that from the viewpoint of immediate profits they were probably dubious investments.¹⁹ The railway must depend primarily for support upon local business. "There must be a good country and a local business—either existing or being developed."²⁰

But there was a more cogent reason for railway development in Canada. Keefer asserted that railways were essential if even the present stage of Canadian economic progress was to be maintained. The Americans, a restless, early-rising, go-ahead people were setting the pace in railroad construction. The Canadians had no option but to follow their example; otherwise capital, commerce, friends, and children would all abandon Canada for better-furnished lands.²¹

But, if the construction of railways was essential, it was also a work which would bring immense benefits to Canada. It would effect a transformation nothing short of marvellous in its economic, social, and political organization. In describing all the amazing benefits which would result from railway construction Keefer was at his most effervescent and most exuberant. Those who profess to doubt the existence of a Canadian literature would do well to read the more lyric and imaginative passages of *The Philosophy of Railroads* and Keefer's lecture on *Montreal*. In contrasting Canada then with Canada mechanized, Keefer painted a picture of existent conditions which reads like the opening sentences of a report on Maritime grievances; "the venerable churchyard is slowly filling up with tombstones—and the quiet residents arrive at the conclusion that they are a peculiarly favoured people in having escaped the urge for improvement." Having sketched this dismal scene of stagnation and decay, Keefer exerted his imaginative genius to the full in portraying the disturbing but stimulating effect of railway construction on the backwoods Canadian community: the initial alarm of the inhabitants; the apprehensions of the probable mother of a probable child lest her offspring should be drawn and quartered on the rail; the immediate impetus to the region upon the beginning of construction with its attendant demand for foodstuffs and timber and its increased opportunities for employment; the subsequent rise in land values; the access to new markets for agricultural produce; the development of manufacturing and the rise of towns—all this Keefer describes in the most florid of language. "A town has been built and peopled by the operatives—land rises rapidly in value—the neglected swamp is cleared and the timber is converted into all sorts of wooden 'notions'—tons of vegetables, grains, or grasses, are grown where none grew before—the patient click of the loom, the rushing of the shuttle, the busy hum of the spindle, the thundering of

¹⁸Keefer, *Philosophy of Railroads*, 17. This did not prevent Keefer upon occasion from anticipating profitable through traffic. His advocacy of the Canada Central, in the fifties and sixties was based partly on the idea that the line, connecting Montreal and Ottawa with Lake Huron, might very well secure heavy American trade by connecting with the western American network at Sault Ste. Marie. See Keefer, *The Canada Central Railway* (Ottawa, 1870).

¹⁹Keefer, *Philosophy of Railroads*, 24-5; *Report on the Preliminary Survey of the Kingston and Toronto Section of the Canada Trunk Railway* (Toronto, 1851), 25.

²⁰Keefer, *Philosophy of Railroads*, 17.

²¹*Ibid.*, 28.

the trip-hammer . . . are mingled in one continuous sound of active industry."²²

Not only would railways open the country and develop its resources, but Keefer saw in them a great civilizing force—the first agent in what he called the practical elevation to be brought about by a rapid development of commerce and the arts. Keefer was essentially an apologist of the machine age. He saw in the influence of railways and subsequent development a resultant decline in isolation, provincialism, and ignorance. Politically the whole tone of the electorate would be improved. No longer would agricultural rustics be dependent for political opinion solely upon a "*nisi prius* wrangler" or the eloquence of the local store-keeper who "with mortgages, long credits, tea and tobacco,—aided by a 'last call' to all doubtful supporters,—incites the noble yeomanry to assert their rights."²³ The enlightenment resulting from increasing contacts with civilization, Keefer predicted, would end not only poverty but indifference, the bigotry or jealousy of religious denominations and political demagoguery.

Keefer's works were concerned also with the ways and means of railway construction. In connection with the mobilization of capital, he maintained that the initiative should come from Canadians themselves. The agricultural and trading population of Canada, he asserted in *The Philosophy of Railroads*, had a greater amount of unemployed capital than was commonly supposed. It was clearly in their interests to employ it in the economic development of the country.²⁴ Later, when the potentialities both of this source and also of British loans appeared for the moment to have been exhausted, Keefer in 1870 urged the method of extensive land grants to railways, in connection with the proposed Canada Central Railway from Montreal to Ottawa and Georgian Bay.²⁵ This at least was a policy which the Canadian government was to take to heart in the not too far distant future. Throughout his works, also, is much discussion on such points as the necessity of railways passing through the country most probably productive, even at the expense of directness, the advantages of avoiding steep gradients where possible, the merits of gradual curves as opposed to sharp ones, and so forth.²⁶ But, on the whole, it is his advocacy of railroad construction, rather than his advice on methods to be employed, for which Keefer is most noteworthy.

IV

A prominent Canadian historian once told me he was tired of studies which were concerned with the influence of this upon that. In spite of this dictum, I cannot resist a mention of W. H. Merritt's probable influence upon Keefer.²⁷ Keefer was, after all, Merritt's protégé and there is a strik-

²²*Ibid.*, 6-7.

²³*Ibid.*, 8.

²⁴*Ibid.*, 4-6.

²⁵Keefer, *The Canada Central Railway*.

²⁶See Keefer, *Philosophy of Railroads*; *Report on Kingston and Toronto Section of the Canada Trunk Railway*.

²⁷See D. C. Masters, "W. H. Merritt and the Expansion of Canadian Railways" (*Canadian Historical Review*, June, 1931); "Evolution of a Frontiersman" (*Manitoba Arts Review*, spring, 1940).

ing similarity between their utterances upon transportation policy. Both showed the heady effects of writing about the Empire of the St. Lawrence. Both advocated commercial freedom to develop the through trade and both ended as virtual protectionists. Both were compelled to consider railways as a supplement to canals in the development of Canadian transportation. Merritt, however, considered railways almost exclusively as a mere agency of transportation; Keefer was more keenly aware of their general value in the economic development of the country. Much of this similarity in thought was merely the result of a similar reaction to similar conditions; but the element of personal influence must also be taken into account.

What then is to be our estimate of Keefer? His glowing prophecies of the early development of an immense St. Lawrence trade were not fulfilled. Keefer himself admitted the dismal result in 1863 and in 1893 and was able to offer many explanations. Advantages in the Canadian inland waterway were insufficient to capture the American trade. Lower freight and insurance rates between New York and Europe, superior shipping accommodation in New York, the greater supply of capital in New York and New England which held the western export trade to American lines, the ruinous competition of American railroads which carried produce at non-paying rates simply to increase gross carrying figures and raise their stock quotations, and particularly the failure of Canada to capture any of the American incoming trade—all combined to favour the American routes.²⁸ This last factor proved particularly disastrous to Canadian railways, according to Keefer. The Grand Trunk could tap the western grain reservoir at Chicago and secure an almost continuously-descending stream, though not often a paying one; but it could not capture the incoming and more remunerative traffic.²⁹ Whether the development of Keefer's Lake Champlain project would have seriously altered the result was never, of course, demonstrated.

In the long run Keefer was justified in predicting that the advantages of the St. Lawrence, both of position and of the nature of its navigation, would lead to the development of an extensive grain-exporting trade. But it was the development of the Canadian West and not of the American Middle West which bore out his prediction. Keefer eventually foresaw this, and by 1869 the Canadian prairies were coming to occupy in his scheme of things the former position of the American West.³⁰

Keefer had less to retract in regard to railroads since his predictions in reference to through traffic from the American West had been, on the whole, more restrained. Moreover, he had predicted in graphic language the real value of the railroad in the development of the country. Perhaps the most valuable feature of his work was that he helped to generate some of the enthusiasm which is required in the opening up of a young country.

²⁸Keefer, "Canals of Canada" (*Transactions of the Royal Society of Canada*, 1893, XI, section 3, 44); *Canada Waterways*, 15-16; "Travel and Transportation," 141, 179-85, 247-8.

²⁹*Ibid.*, 247-8.

³⁰See Keefer's series of letters in the *Montreal Gazette*, April 6, July 12, July 14, 1869; Jan. 22, Feb. 2, 1870; Keefer, *Canada Waterways*, p. 17.

DISCUSSION

Mr Landon raised a question in regard to the antagonism which had existed between Keefer and Samuel Zimmerman. He asked if it were known whether or not this antagonism was a reflection of the attitude of Merritt, Keefer's superior in office.

Mr Glazebrook inquired if information were available in regard to Keefer's work as an engineer. He said that the absence of adequate studies of engineering in Canada left a gap in the history of transportation. Was Keefer as good an engineer as his many commissions would indicate? Mr Masters replied that he had discovered ample material in relation to this question, but that it would have to be studied by someone with a technical knowledge of engineering.

Mr Brebner said that Keefer had been very active in the construction of municipal water works and suggested that this part of his work may have been responsible for his wide reputation amongst Canadian and American engineers. He also referred to two points that arose from the papers of Mr Masters and Mr McKee and that warranted further study: one was the persistent interest of the American mid-West in the St. Lawrence Waterway System; the other, the way in which the United States had continually reserved the coastal trade of this system for its own vessels. He suggested that Canadians should think of the St. Lawrence system not only as a highway into the American mid-West, but as a channel of communication for their own commerce.