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RAIL AND WATER TRANSPORTATION.

Owing to the wonderful increase in the carrying capacity of railways during the past twenty years, and to the corresponding reduction in the cost of rail transportation, there has arisen a very general impression that the days of the usefulness of canals have passed. It is pointed out that whereas in 1880, the average rate of freight per ton per mile on all the railroads of the United States was \$1.17, this was reduced to seventy-eight cents in 1896, and on some railroads as low as fifty-five cents. Engineering News says:—"It is plainly evident that a few years more will see the entire disappearance of the old-time canal barge as a vehicle for freight transportation. The 60,000 pound freight car is a competitor which it cannot meet." Among other facts which have tended to the frequent opinion that canals are obsolete may be mentioned the following:—The Delaware and Hudson Canal Company has recently abandoned part of its water route; the State of Maryland is offering to sell the Chesapeake and Ohio canal as a useless and expensive encumbrance; Mr. Andrew Carnegie, who was one of the earliest advocates of the construction of the now abandoned canal between the Ohio and Lake Erie, to give Pittsburg a water avenue to the lakes, now says that conditions have to change, that the canal would be a costly failure. In addition to these facts, the Erie canal appears to be incapable of maintaining its former traffic in competition with the great trunk railways running from Buffalo to New York. Neither have the Canadian, Welland and St. Lawrence system of canals been able to secure for that route anything like the volume of traffic which seemed to be reasonably expected when they were undertaken. Admitting all these facts, do they warrant the conclusion that canals are obsolete,

or do they not rather suggest the enquiry whether canals, through which vessels and barges of large capacity can pass with greater rapidity of transit, may not yet far outstrip railroads in cheapness of transportation?

Mention has been made of a few canals which have now become useless, or whose traffic has proved quite insufficient to afford a fair return for the expenditure incurred. It is only fair to refer to other canals which have proved successful. Among these may be mentioned:

(1) The Suez canal, the tonnage passing through which in its first year, 1869, was 6,756 tons net; in 1870, 436,699 tons; in 1875, over 2,000,000 tons; in 1891, 8,698,777 tons, since which there has been comparatively little change. Nor should it be lost sight of that Great Britain has been an immense gainer financially through the splendid policy by which the Earl of Beaconsfield secured the contract of this canal.

(2) The Sault St. Marie canal, connecting Lake Superior with the lower lakes. The traffic on this canal during the season of 1898 amounted to 21,234,664 tons, carried in 17,161 vessels. Among the principal articles were:—7,778,043 barrels flour, 88,418,480 bushels grain, 11,706,960 tons iron ore, 3,776,450 tons coal, 895,485,000 m. feet lumber, 250,170 tons pig iron, 124,226 tons copper, etc.

(3) German canals. The Kaiser Wilhelm canal has been in operation three years; the tonnage passing through in first year was 1,505,083 tons, and for fiscal year ending March 31, 1898, was 2,469,795 tons, an increase of sixty-four per cent. Mr. Frank H. Mason, United States Consul-General at Frankfort, in a report to his Government entitled, "Inland Water Transportation," says:—"No one who studies the underlying causes of German industrial progress can fail to notice the important and rapidly increasing role that is played by the canals and navigable rivers, which are being improved and extended every year, and carry freights at such low rates that protection economists begin to complain that they render the importation of foreign merchandise altogether too cheap and easy. A few figures will show the enormous development of inland water traffic in this country during the past ten or twenty years. Prior to the canalization of the river Main from Frankfort to its confluence with the Rhine at Mayence, which was finished in 1886, only small boats ascended the river to this point, and Frankfort had a total traffic of not more than 150,000 tons, against 930,000 tons of freight annually received and sent by rail; the per centage being fourteen to eighty-six respectively. During the first five years after the river was canalized, the water traffic rose to 700,000 tons against 1,400,000 tons by rail, an increase of 467 per cent. to fifty per cent. by rail. Since then the river traffic has increased steadily year by year, to a total of 1,753,799 tons in 1896, to which is to be added 225,253 tons of logs and lumber arriving in the form of rafts from the Upper Main. Similarly the trade of Cologne rose from 200,000 tons in 1876 to 1,000,000 tons in 1896, and the aggregate of the German Rhine ports, from 5,100,000 tons to 16,250,000 tons in same period. The total length of German canals and inland waterways is 8,700 miles; and important extensions, such as the Oder canal groups, and the Elbe-Trave canal are still in course of construction. The Danube-Oder and Oder-Muldan. Elbe canals will, when completed, form a continuous waterway nearly 2,000 miles long, and will connect the waters of the Baltic with those of the Black Sea.