

## THE MANCHESTER SHIP CANAL

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During the present time of canal agitation in the United States the great ship canals of the world are attracting much attention. A study of the Manchester Ship Canal was made in part so as to be able to contrast it with internal waterway enterprises in this country.

The building of the Manchester Ship Canal was a great engineering feat and a magnificent venture made in spite of determined opposition on the part of railways, the port of Liverpool, and many land holders. The advantage of a waterway from eastern Lancashire to the sea was recognized long before the days of the present ship canal. The Duke of Bridgewater in 1722 constructed an extension of the canal from his collieries at Worsley to Manchester and thence to the Mersey River at Runcorn. This canal was navigated by barges carrying about 50 tons of cargo but was inadequate for the increasing amounts of cotton, timber, grain, and other goods demanded in the Manchester area. In later years railroad rates were declared to be too high, and agitation for a ship canal started as early as 1825. It was not until 1882 that definite steps were taken which culminated in the opening of the Manchester Ship Canal by Queen Victoria in 1894<sup>1</sup>.

It was not easy to prove the necessity of a canal that would accommodate ocean vessels. Stormy debates in Parliament, hundreds of petitions, and many long discussions are on record about the canal and the plan of its course. Finally, a lock canal plan was adopted, although Manchester is only 70 feet above sea level. The Mersey estuary, the Irwell River, and the old Bridgewater Canal complicated matters. Since the rivers meander widely and since the plan was for a straight canal, it was necessary to undertake heavy cutting through the valleys, impeded by floods and tides. The old canal passed over the Irwell River at Barton, near Manchester, on an aqueduct too low to permit steamers to pass under it. The plan of the ship canal called for the use of this portion of the river, and the old canal was essential as a feeder. Hence,

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<sup>1</sup> Leech, B., *History of the Manchester Ship Canal*. Manchester, 1907.

it was thought best to purchase the Bridgewater Canal outright and to provide means for its maintenance. A notable engineering project made possible a swing aqueduct in place of the original crossing of the river. The water in the swing portion is retained by closing gates at each end, and similar gates close the fixed portions. When the aqueduct is swung, in the manner of a swing bridge, large steamers may pass on the ship canal underneath. This Barton aqueduct is one of the show places of England.

The ship canal is  $35\frac{1}{2}$  miles long. Its principal docks are at Manchester. The access channel has been excavated to a depth of 13 feet below Liverpool Bay datum. From Eastham to Ellsmere Port the depth is 30 feet, and from Ellsmere Port to Manchester 28 feet. The bottom width is 120 feet, except at a few places where it is 170, 175, or 180 feet. There are two parallel locks at Eastham which are open to estuary level whenever the tide rises more than 26.2 feet above Liverpool Bay datum. When the tide is below this level, access is obtained by means of the locks. A vessel can be passed through the largest lock (600 feet by 80 feet) in eight minutes or less.<sup>2</sup>

H. G. Moulton in 1912 came to the conclusion that the Manchester Ship Canal was a losing venture.<sup>3</sup> True, at that time there seemed little prospect that the canal would pay for itself. The expenditure on capital account up to December, 1909, had been 16,790,491 pounds sterling. If it had been known in 1894 that the cost would exceed more than twice the amount of the original estimate, the canal, admittedly, would not have been built. Many unforeseen difficulties had been encountered, such as silting, failures of sea embankments, defects in locks and sluice gates, and deficient dock and trade arrangements. The anticipated tremendous traffic had not been realized, the company had not been able to pay the interest on its debt, and the outlook for the future was not encouraging. In 1909, Manchester business men (quoting Moulton) were frankly admitting that the canal had been a great disappointment.

In the summer of 1928, however, a different attitude was found among Manchester business men. They pointed with pride to the excellent facilities and splendid efficiency at the docks, to the extensive late additions to equipment, and to the crowding of

<sup>2</sup> Port of Manchester, Official Sailing List and Shipping Guide, (1928), p. 23.

<sup>3</sup> Moulton, H. G., *Waterways Versus Railways*, (1912), p. 149.

traffic on the canal almost throughout its length. The Manchester Dock estate now covers an area of  $406\frac{1}{2}$  acres, including a water space of 120 acres, and quays  $5\frac{5}{8}$  miles long. The storage area is  $286\frac{1}{2}$  acres. Eight docks ranging in size from  $780 \times 120$  feet to  $2700 \times 250$  feet have been constructed. The Dock equipment includes 255 cranes (hydraulic, steam, and electric), 36 electric hoists, a floating, self-propelling, derricking and revolving crane of 60 tons lifting capacity, a fleet of lighters, 6 floating pontoons, a coaling crane, 54 locomotives and 2,432 railway cars, 30 hydraulic and 47 electric capstans, 69 transit sheds and warehouses of which 16 are of five floors and 13 of seven floors, a cold storage chamber of 300,000 cubic feet capacity, and, in brief, all modern appliances for port efficiency.

The Manchester business men quoted statistics that showed a great increase in trade and pointed to the excellent prospects for future trade. They showed that the current interest, together with dividends on the investment, had been paid in recent years in spite of the fact that up to December 31, 1927, the expenditures amounted to 19,675,290 pounds. In values of total imports and exports, Manchester was the fifteenth port of the United Kingdom in 1894 (the first year of the ship canal) but by 1927 it had become fourth. In tonnage entered, it was the twenty-eighth port in 1894 and the ninth in 1927. In tonnage cleared, it rose from twenty-third in 1894 to tenth in 1927. The total revenue of the canal, which has been more than a million pounds annually since 1919, amounted to 1,576,237 pounds in 1927.

It is evident that the canal has been of much value to Manchester and the Lancashire industries. The city has developed from a textile center into the pivotal point for a host of other activities, and surely the waterway has attracted interests that rely on ocean and internal transportation. It is also evident, however, from comparative studies, that if this canal, providing an outlet to the sea for one of the world's great and intensive industrial areas, is a losing venture, certainly no tremendous financial profit could be expected from a comparable ship canal penetrating the interior of any country.