

A Brief History Of British Canals

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River navigations, that is rivers widened and deepened to take large boats, had existed in England since the Middle Ages: some can even be traced back to Roman times. In 1600 there were 700 miles of navigable river in England, and by 1760, the dawn of the canal age, this number had been increased to 1300 miles. This extensive network had prompted many developments later used by the canal engineers, for example, the lock system. But there were severe limitations: generally the routes were determined by the rivers and the features of the landscape and so were rarely direct. Also there were no east-west or north-south connections.

Thus the demand for a direct inland waterway system increased steadily through the first half of the 18thC with the expansion of internal trade. Road improvements could not cope with this expansion, and so engineers and merchants turned to canals, which were used extensively on the continent.

One of the earliest pure canals, cut independently of existing rivers, was opened in 1745, at Newry in Northern Ireland, although some authorities consider the Fossdyke, cut by the Romans to link the Rivers Trent and Witham, to be the first. However, the Newry is more important because it established the cardinal rule of all canals, the maintenance of an adequate water supply, a feature too often ignored by later engineers. The Newry Canal established the principle of a long summit level, fed by a reservoir to keep the locks at either end well supplied. Ten years later, in England, the Duke of Bridgewater decided to build a canal to provide an outlet for his coal mines at Worsley. He employed the self-taught James Brindley as his engineer, and John Gilbert as surveyor, and launched the canal age in England. The Bridgewater Canal was opened in 1761. Its route, all on one level, was independent of all rivers; its scale of operations reflected the new power of engineering, and the foresight of its creators. Although there were no locks, the engineering problems were huge; an aqueduct was built over the River Irwell at Barton, preceded by an embankment 900yds long; 15 miles of canal were built underground, so that boats could approach the coal face for loading (eventually there were 42 miles underground, including an inclined plane), and the puddled clay method was used by Brindley to make the canal bed watertight. Perhaps most important of all, the canal was a success financially. Bridgewater invested the equivalent of £3 million of his own money in the project, and still made a profit.

Having shown that canals were both practical and financially sound, the Bridgewater aroused great interest throughout Britain. Plans were drawn up for a trunk canal, to link the four major rivers of England: the Thames, Severn, Mersey and Trent. This plan was eventually brought to fruition, but many years later than its sponsors imagined. Brindley was employed

as engineer for the scheme, his reputation ensuring that he would always have more work than he could handle. The Trent & Mersey, and the Staffordshire & Worcestershire Canals received the Royal Assent in 1766, and the canal age began in earnest.

Canals, like the railways which followed, were built entirely by hand. Gangs of itinerant workmen were gathered together, drawn by the comparatively high pay. Once formed, these armies of 'navigators' - hence 'navvies' - moved through the countryside as the canal was built, in many cases living off the land. All engineering problems had to be solved by manpower alone, aided by the horse and occasional steam pump. Embankments, tunnels, aqueducts, all were built by these labouring armies kept under control only by the power of the section engineers and contractors.

The Staffordshire & Worcestershire Canal opened in 1770. In its design Brindley determined the size of the standard Midlands canal, which of course had direct influence on the rest of the English system as it was built. He chose a narrow canal, with locks 72ft 7in by 7ft 6in, partly for reasons of economy, and partly because he understood that the problems of an adequate water supply were far greater than most canal sponsors realised. This standard, which was also adopted for the Trent & Mersey, prompted the development of a special vessel, the narrowboat, with its 30-ton payload. Ironically, this decision by Brindley in 1766 ensured the failure of the canals as a commercial venture 200 years later, for by the middle of the 20thC a 30-ton payload could no longer be worked economically.

The Trent & Mersey was opened in 1777; 93 miles long, the canal included five tunnels, the original one at Harecastle taking 11 years to build. In 1790 Oxford was finally reached and the junction with the Thames brought the four great rivers together. From the very start English canal companies were characterised by their intense rivalries; water supplies were jealously guarded, and constant wars were waged over toll prices. Many canals receiving the Royal Assent were never built, while others staggered towards conclusion, hampered by doubtful engineering, inaccurate estimates, and loans that they could never hope to pay off. Yet for a period canal mania gripped British speculators, as railway mania was to grip them 50 years later. The peak of British canal development came between 1791 and 1794, a period that gave rise to the opening of the major routes, the rise of the great canal engineers, Telford, Rennie and Jessop, and the greatest prosperity of those companies already operating. At this time the canal system had an effective monopoly over inland transport: the old trunk roads could not compete, coastal traffic was uncertain and hazardous, and the railways were still a future dream. This period also saw some of the greatest feats of engineering.