SOUTHAMPTON CANAL TUNNEL

By EDWIN COURSE

ALTHOUGH canals are associated with the Midlands rather than the South of England, by the beginning of the nineteenth century, Hampshire possessed an appreciable mileage of inland navigable waterways. The first of these, the Itchen, had been used for many years, but the engineering works which effectually converted it from the River Itchen to the Itchen Navigation were completed between Woodmill and Winchester about 1710. Partly because of its importance to millers, and partly for ease of water management, the corresponding route following the Test consisted of a new cut – a canal as opposed to a navigation. The Andover Canal was authorized in 1789 following the River Anton from Andover down to Fullerton, and the Test down to Redbridge (29 Geo. III, c.72). It was opened throughout in 1794 and settled down to 65 years of unintensive but steady use, after which its route was taken up by a railway. Its traffic was mainly local although if various schemes had materialized, it would have formed part of the national waterway network.

The most important connection, which did achieve partial construction, was the Southampton and Salisbury Canal. This was to consist of two separate lengths. The Western Arm ran for 13⅜ miles from Salisbury to join the Andover Canal at Kimbridge. Joining the two arms was nine miles of the Andover Canal between Kimbridge and Redbridge. The Eastern Arm ran from Redbridge for 4¼ miles to Southampton. It followed the north bank of the river until it reached the peninsula on which stood Southampton. This was to be crossed by means of a tunnel, beyond which the line divided, one branch running south to a sea-lock near Gods House Tower and the other running to the River Itchen at Northam.

At a well attended meeting held at the *Star* in Southampton, 89 people agreed to invest in the canal, the largest groups being from Southampton and from Bristol. The Bristol interest was based on plans for waterways linking Salisbury and Bristol. The initial reaction from Salisbury was lukewarm but subsequently its citizens became more interested and Committees were formed in Southampton, Bristol and Salisbury (Welch 1966). A survey to determine the line of the canal was carried out by Joseph Hill of Romsey, and Thomas Ridding was appointed secretary. He was a Southampton solicitor, and also the town clerk. Joseph Hill produced detailed estimates for the provision of a waterway 15 ft. wide at the bottom and 27 ft. wide at the top with 4 ft. of water over the sills of the locks, to carry barges 60 ft. long and 8 ft. wide (SRO D/PM 6/3/11–13). Particular entries refer to the aqueduct for carrying the Eastern Arm over Tanners Brook at Millbrook and to the tunnel in Southampton but there is no specific reference to the towpath for the horses.

In order to achieve corporate status, to acquire compulsory purchase powers and limited liability for the shareholders, an Act of Parliament was required, and this was obtained in 1795 (35 Geo. III, c.51). By August 1795, contractors were invited to tender for the works and Thomas Jinkins, described as a stonemason, undertook to build the Eastern or Southampton Arm. Bricks were made from local brick-earth dug out from Houndwell, Southampton; stone was brought in from Purbeck. This was a period of promise, when there were hopes that not only

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would the canal form part of a route from Southampton to Bristol, but also it would be linked to London via the Itchen Navigation and the Basingstoke Canal. The gap between the Itchen Navigation terminal at Winchester and that of the Basingstoke Canal at Basingstoke was to be closed by the London and Southampton Ports Junction Canal which, like the Southampton and Salisbury, had Hill for surveyor and Thomas Ridding as Secretary. With the aid of steam pumping engines a canal between Winchester and Basingstoke could have materialized, but from an economic point of view, its chances were slight. In the event, it failed to attract enough support and its position was not helped when it emerged that the Southampton and Salisbury was running into financial difficulties.

The biggest single work was the Southampton tunnel and by December 1797 the committee were sufficiently disturbed to invite reports, not only from their own surveyor but also from the eminent engineer, John Rennie. He was critical of both the quality of the bricks being used and also of the merit of the constructional work. In the early part of 1798 there was some improvement, but the shareholders were disenchanted and the supply of money dried up. There was nothing to pay the contractors, who with their workmen, drifted away. The unfortunate Hill was unable to obtain money owed to him by the company and finished up as a debtor in King's Bench prison. The only hope was to obtain another Act of Parliament giving new powers for raising money. This was done and fresh supplies of money began to trickle in (39 & 40 Geo. III c.108). A new engineer, George Jones was appointed and new contractors, Messrs. Brawn and Small commenced work on both arms of the canal. They were bankrupt by January 1802 and informed Thomas Ridding, who was still the Secretary that they regretted being 'under the disagrable nessaty of leaving the Country'. Jones continued with direct labour and employed four Newcastle miners on the tunnel.

It was probably in 1804 that the canal reached its maximum development. At that time it was open for navigation from the west end of Southampton tunnel to Alderbury Common, at which point goods could be transferred to the turnpike road for forwarding to Salisbury. Subsequently, no more was done and the existing work fell into decay. Thomas Ridding died, and his son, also Thomas Ridding, became both secretary to the canal company and town clerk. By 1821 the Southampton arm of the canal had become a stagnant ditch and repository for rubbish. There were moves to require Thomas Ridding as town clerk, to sue himself as secretary of the canal company, but these he managed to parry. Finally, by the Marsh Act of 1844, the Corporation obtained powers to fill in the canal (7 & 8 Vic. c.54). By happy chance, the Southampton and Dorchester Railway was under construction by 1847 and between Northam and Redbridge followed roughly the same line as the canal. The canal tunnel was far too small to carry a double line railway and some stretches of the canal were left as isolated strips of water, but much of it disappeared under the formation of the railway. By way of contrast, the line through Romsey to Salisbury paralleled the Western arm of the canal, and only coincided with it for short stretches. Because of this much of the Western arm has survived.

Until the 1960s the longest stretch of the Eastern Arm to survive consisted of about 1,000 yards on the south side of the railway at Redbridge. Much of this was filled in by the Docks Board between 1963 and 1965, but the stretch through the railway works was still extant in May 1966. A length was pumped out by the Southampton Auxiliary Fire Service to enable a section to be examined and measured (Welch 1966). In 1964, in connection with a flood relief scheme, the Hampshire River Board found part of the culvert which carried Tanners Brook under the canal. This was photographed before it was filled in. East of the tunnel, the canal divided. The

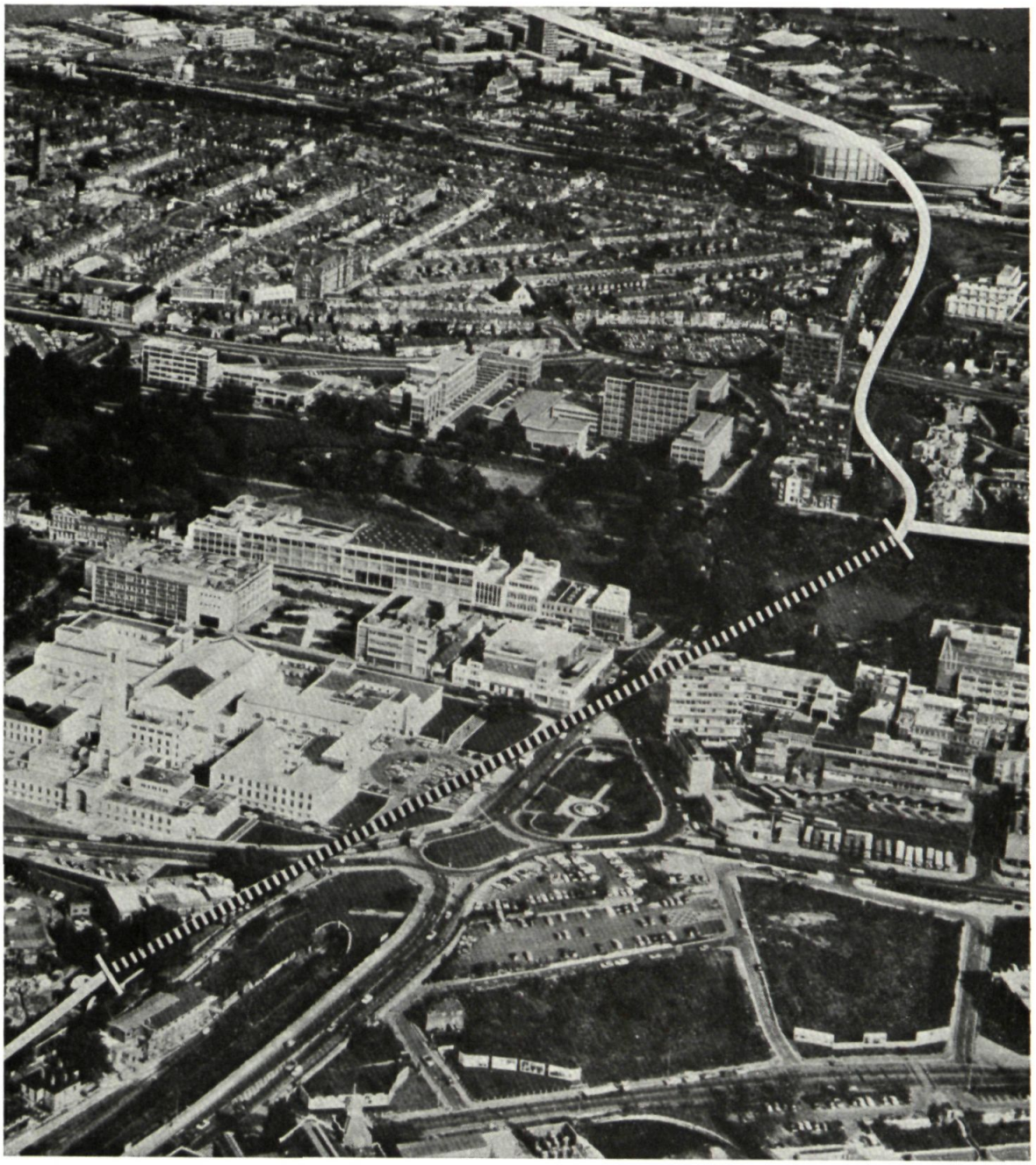

Fig. 1. Aerial view showing line of canal and tunnel through Southampton. (Copyright: Aerofilms Ltd.)

southern branch is commemorated by Canal Walk. There were no visible remains but part of a wharf was exposed when excavation was carried out for the foundations of Palmerston House in 1961. Of the arm to Northam, part was obliterated by the railway, and much of the remainder by the gasworks.

Without doubt, the most important relic in the city is the tunnel. As explained above the railway tunnel crossed the canal tunnel obliquely. The canal tunnel had to be level, but the railway tunnel climbed from both portals at 1 in 396, which enabled it to clear the top of the canal tunnel by about a foot. The railway contractor constructed a heading from the new tunnel to the canal tunnel which he proceeded to use as a tip. This upset the drainage, and the saturated subsoil displaced the lining of the new tunnel to such an extent that the main London road over the top of it subsided. Because of this, when the railway was opened on 1 June 1847, the tunnel was impassable and locomotives and coaches moved across the town on lorries drawn by numerous horses. The railway tunnel was officially opened on 6 August 1847 and for the next 117 years, survived with only routine maintenance. However in 1964 it was observed that the floor, or invert was rising towards the roof and reconstruction was necessary. This involved the exposure of the heading to the canal tunnel, and as the ends had been blocked off for many years, gave a unique opportunity for investigation. Dr. Edwin Welch, the City Archivist, with

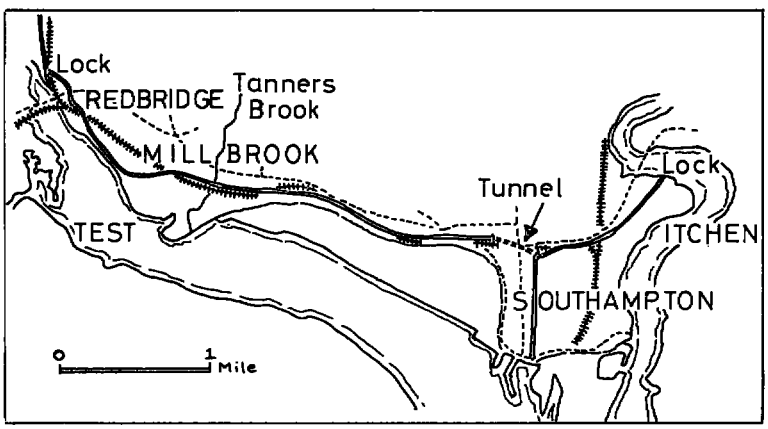

Fig. 2a. Sketch map showing line of Southampton and Salisbury Canal between Redbridge and Northam (based on Welch, 1966. = line of canal ⊢⊢⊢ railway – – – main roads.

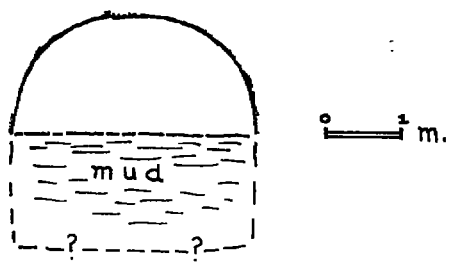

Fig. 2b. Section of canal tunnel. Below string line, section is conjectural but City Engineers Department suggests walls almost vertical. (N.B. Fig. should show 3 rings of bricks at crown and 2 at sides). Drawing by A. M. ApSimon.

the railway engineers, penetrated the heading but not unexpectedly, at this point the canal tunnel was largely blocked with the spoil from the railway tunnel.

The opportunity to examine the tunnel finally came at a different point. The corner of the old building of King Edward VI School adjoined the line of the tunnel, and in the 1920s a subsidence took place just outside the building. In January 1975, a second subsidence occurred and the City Engineer decided that an investigation of the tunnel was necessary, especially of the sections under the main roads adjoining the City Centre. Entry was achieved by means of two shafts, one on the site of the subsidence at the back and one at the front of the old school. These were required not only for inspection purposes but also for the introduction of fly ash to fill the bore of the tunnel and achieve stability. Subsequently boreholes at other points were sunk for inspection purposes, this being carried out by TV cameras. The filling of the bore made recording a rescue exercise, and this was undertaken by Southampton City Museums Department and the University Industrial Archaeology Group in collaboration with the City Engineer's Department.

On balance, inspection and recording confirmed the documentary evidence. The bricks were made from brickearth, and the small sample of 20 bricks examined showed variations in both dimensions and quality. The sample was too small to determine average dimensions but typical dimensions were stretchers 22.8 × 11.4 cms and headers 11.4 × 6.4 cms (9 in. × 4½ in. × 2½ in. is a common size for bricks of this period). In the same vein, only two lengths amounting to about 60 metres were examined, out of a total tunnel length of 627 metres. In both cases, the bricks were laid in English bond, with three rings at the crown of the arch, reducing to two at the sides. It was not possible in the time available to penetrate the deposits in the bottom of the tunnel to obtain information about the invert. A lime mortar was used and not unexpectedly, there was some formation of stalactites. Far more surprising was the penetration of the tunnel by the roots of trees in the eastern of the two lengths investigated, which was about 7.4 metres from the surface. Another feature, found in both the eastern and western lengths was the black soot-like growth covering the walls to the height at which water stood before the City Engineer commenced pumping. This was submitted to Dr. John Manners of the University Biology Department, who considered that it was probably organic in origin, as it showed signs of cellular structure. He suggested that it was a simple

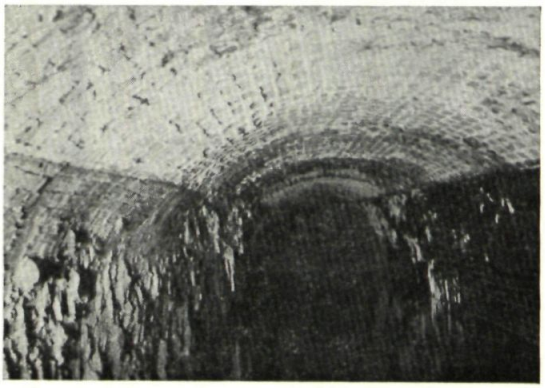

Fig. 3a. View from bottom of shaft looking east towards site of an earlier collapse. Accretions from the lime mortar are visible: the water level has been lowered by pumping.

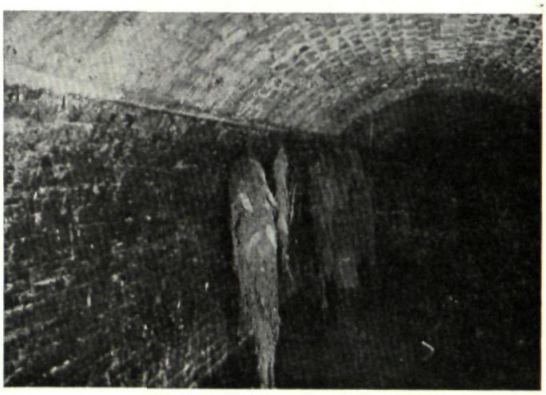

Fig. 3b. View from bottom of shaft looking west towards western portal. Tree roots and black organic growth both visible. 30 January 1975.
(Photographs: E. Course)

organism, such as a unicellular or colonial alga or a simple fungus.

Of particular interest was the variation in the cross-section of the tunnel. For instance, the maximum width in the eastern length varied from 2.9 metres to 3.25 metres. This may have reflected the ineptitude of the engineer, but may also indicate the change from one contractor to another. As explained above, it was not possible to penetrate to the invert. However, a string line was extended across the maximum width in the eastern length, and the profile of the roof was recorded (Fig. 2b). It is of course, difficult to allocate responsibility for the present cross-section between original construction and later distortion.

In addition to information about the character of the tunnel, the City Engineers Department needed to determine its location. The coping and the keystone over the western portal were found under the concrete floor of what is now the Mitchell Aircraft Museum. This discovery not only fixed the position of the western end but also enabled Mr Roy Cockaine of the Engineers Department to produce an interesting conjectural drawing of the original appearance of the portal. To the east the Engineers Department sank four small bores, and by means of TV cameras, checked the rest of the line of the tunnel.

In December 1976 despite the filling of the bore with fly ash, there were some indications of further subsidence in the lawn adjoining the south-west corner of the Civic Centre. While given more time and resources, additional detailed information about Southampton canal tunnel could have been obtained, it would seem unlikely that there would be any surprises. The one important gap is the failure to confirm by archaeological evidence whether or not the tunnel was completed. So, for the time being, it will be necessary to accept the documentary evidence, which suggests that the two ends just failed to meet.

Acknowledgements

It will be readily apparent that this investigation was made possible by the work done by the City Engineer and members of his department in connection with the stabilizing of the ground above the canal tunnel. Their help, co-operation and enthusiasm was much appreciated. As mentioned above, recording was undertaken jointly by the City Museums Department and the University Industrial Archaeology Group, and I should like to acknowledge in particular, the contributions of Mr. R. G. Thomson of the Museum and Mr. J. B. Horne of the Group. Also Mr. A. James and Mr. C. F. Allen have read the typescript and made most helpful suggestions.

REFERENCES

Abbreviation

SRO Southampton Record Office.

Original Sources

Acts of Parliament

SRO D/PM 6/3/11–13, quoted in full in Welch 1966.

Other reference

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Author: Dr. E. A. Course, Department of Adult Education, The University, Southampton, SO9 5NH.