

## Brunel lock and the Feeder cut: Two unsuccessful attempts at re-opening John Powell

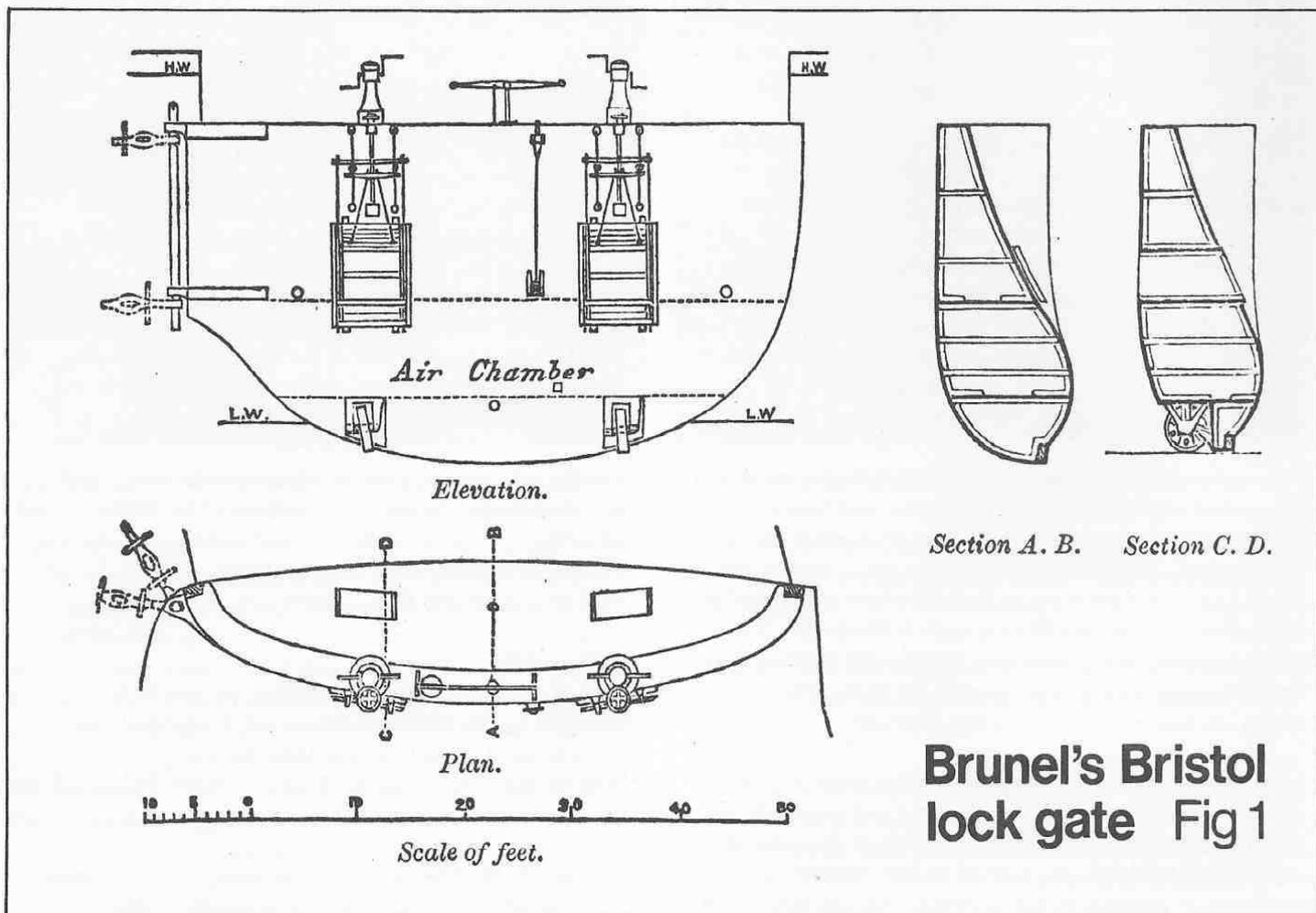
A lengthy search of Bristol Docks Committee Minutes, and other records in connection with an article which appeared in *BIAS Journal* 12<sup>1</sup> revealed separate attempts to re-open two locks in the City Docks which had long since been closed. Though the details are far from complete, the continued and deepening interest in the history of the docks makes both incidents worth recounting.

### Brunel Lock

Many BIAS members will be very familiar with Brunel Lock in Cumberland Basin, being aware that it is a re-build of Jessop's original Southern Entrance Lock and that it is of semi-oval cross section. Perhaps fewer will be familiar with exactly how the gates were constructed and how they operated, and that the best description, together with an illustration (Fig 1), is to be found in Isambard Brunel's biography of his father<sup>2</sup>. To summarise very briefly, the wrought-iron hinged gates contained an air-chamber to provide buoyancy, which could be partly flooded as necessary, and there were also wheels at the bottom on each gate. The timber used for the watertight seals was Honduras mahogany.

In late 1881 or early 1882, a vessel apparently became jammed in the lock of the Old Dock in Newport. The Bristol Docks Committee, fearing that a similar occurrence could have serious consequences in Bristol Docks, immediately instructed Thomas Howard, the Docks Engineer, to produce a report on 'regulations to be observed in locking vessels at Cumberland Basin' and 'also upon the condition of Brunel's Lock and Gates, and the cost of putting them in such a state of repair as would enable them to be used in case of necessity'<sup>3</sup>.

Howard's lengthy report is dated 20 February 1882, and it makes very interesting reading. He starts by reminding the committee that Brunel Lock had been kept open against his advice in 1873 at the behest of the captains of the Irish steamers, who said that they might wish to lock out Via Brunel Lock whilst other vessels were coming in via the new Northern Entrance Lock. Howard adds that 'the result has been that from that time to this, not one of the Irish Steamers or any other vessel has been passed through this lock; and owing to its never being used the lock chamber rapidly filled to a considerable depth with a deposit of stiff tidal clay'. This emphatic evidence of total disuse from such an early date is somewhat surprising.



The masonry of the lock chamber is reported as being 'generally in a sound condition'. Howard then gives his description of how the gates operated, the colours referring to a model which he had made for the purpose:-

Each gate is divided into three horizontal compartments, the bottom chamber (in the model coloured blue) is kept always full of water or ballast; - the middle (coloured white) called the air chamber kept tight and intended to be balanced by having more or less water admitted, according as the tide is higher or lower; - and the top chamber (coloured yellow) into which the tide freely flows and ebbs, according to its height. As the large bulk of the lower part of the gate displaces a considerable volume of water, it will be obvious that if from any neglect the balance water in the air chamber is not properly increased, as the tides rise from neaps to springs there will be a tendency in the gate to capsize and float. This catastrophe has happened on two or three occasions, when, one or the other of the gates, from the buoyancy in the air chamber at a high tide has torn itself from its hinges and floated up.

The great problem with operating such a delicate system, however, was the mud which has remained so troublesome in the City Docks to this day:-

Another circumstance which renders these balanced gates specially disadvantageous at this Port, is the great quantity of mud contained in the tidal water. In clear water the gates if worked with care and attention, could be balanced in accordance with the theory, but here from every influx of tidal water there rises a considerable quantity of mud which soon makes them heavy in working and upsets the calculations. The clearing out of this mud is also a constant source of expense.

Of the gates themselves Howard says that '... the plate ironwork forming the outer skin is generally in a pretty good condition... [with]... the plating... better preserved in the lower part than above water'. The major defect is reported as corrosion to the iron bolts which fasten the gates to the wooden 'fits' abutting against the masonry. This not only affects the strength of the whole, but also allows water to leak through bolt holes into the balance chamber. The timber 'fits' and the stone sills are said to '... require considerable repair...'. The wheels and carriages at the bottom of the gates appear to Howard to be sound, but he says that he has no way of knowing without removing the gates. This had proved very difficult in the past:-

On former occasions there has been found considerable difficulty in removing and getting these gates to a place of repair. Before they can be removed all leaks have to be stopped so that they may float which after all they do in a very awkward form. On one occasion one of them was sunk in the basin for some time. All former repairs have been done by beaching them on the bank of the river; and workmen going to and from the shops added much to the cost of repair. I think we can now get them on the patent slip in our yard by which much waste of labour would be saved.

He is also against it on grounds of cost, quoting £400 per gate and referring back to an incredibly expensive incident some 28 years earlier:- 'Looking at the past dock accounts I find that when one of the gates broke off in 1854 the cost of repairing the gate and the anchorages in the masonry amounted to £2433'. His overall lack of enthusiasm becomes clear as he adds further disincentives such as the cost of four extra lockmen needed to operate

the renovated lock, the cost of regular mud clearing and the fact that modern Irish steamers would be too large to use it anyway. As a parting shot, Howard even offers to re-build it as a conventional lock as a cheaper alternative to re-opening.

It is not known what the response of the Docks Committee was to Howard's report, but the fact that Brunel Lock has retained its unique profile and had its gates removed around the turn of the century<sup>4</sup> suggest that no action was taken.

### The Feeder Cut

The other re-opening attempt occurred at the other extremity of the City Docks system some eleven years earlier in 1871. The Feeder Cut was a short channel containing a lock which left the Feeder Canal just to the west of Netham Lock and met the River Avon just below Netham Weir, thus forming the bottom side of a triangle of water channels. Despite its appearance in Jessop's plans<sup>5</sup> and some Ordnance Survey maps<sup>6</sup>, there seems to have been some doubt - even by later City Docks Engineers! - as to whether it had ever actually been built. It would have formed a fifth entry point to the City Docks system, the others being Netham Lock, Totterdown Lock, Bathurst Basin and Cumberland Basin.

Mention of the Feeder Cut first appears the previous year, in 1870, when on the 11 July it was recorded that:-

The Committee took into further consideration the application made some time since by Mr F F Fox to rent the disused Lock near Netham Dam for the purpose of converting it into a Warehouse and thereupon it was resolved that in the opinion of this Committee it was not desirable to alienate any portion of the Works under their control.<sup>7</sup>

Mr Fox was obviously not satisfied with this judgement, however, for at the Docks Committee meeting on 17 July, a letter which he had written from his Little George Street address was read out in full:-

Gentlemen, I beg to acknowledge your note of the 11th instant. Although you refused 'my application for the disused lock near Netham, I venture to ask your permission to land my benzoline at the quay wall adjoining the lock whence it shall be hauled promptly away to this address. Your present tenants will grant me the necessary leave for hauling, landing etc and I really am unable to find any other convenient or suitable landing place outside the Floating Harbour. My position in the petroleum trade as against the London, Liverpool and [ ? ] firms so vitally depends upon being able to compete in this important branch of it, that I venture again to importune you upon the subject, and remain your obedt. servant Francis F. Fox.

This did the trick, as Fox's acknowledgement of permission being granted was read out at the meeting on 25 July. He did not lose interest in the lock itself, however, for the minutes of 31 December record him as saying:- 'The old lock was and is still what attracts me to the spot, and the possible possession of it at some future day was the chief inducement to make the outlay upon the wharf'.

An appendix to the Committee minutes for January 23

1871 consists of a report by Thomas Howard on this part of the Docks, and it is here that he betrays his lack of knowledge regarding the lock cut:-

... The difficulty consists in the fact that right across the land there is the ruin of what was intended for a lock and communication between the Feeder and the Tideway. If ever finished and used it probably has been out of use for at least half a century, and is now in great measure filled up with earth. Even if complete it would be rather a burden than beneficial to the Docks Works, and this result was probably seen originally and would account for its early abandonment.

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No doubt the sudden interest being taken in the Feeder Cut area as an industrial site, together with the stoppage referred to, was in the minds of those whose petition was read to the Docks Committee on 8 May 1871 :-

Read a memorial from several barge owners and millers interested in the navigation of the River Avon:-

"To the Mayor Aldermen and Burgesses of the City of Bristol

The humble memorial of the undersigned bargeowners millers and others interested in the navigation of the River Avon between the Cities of Bristol and Bath Sheweth

That very great inconvenience and expense have been experienced by your memorialists in consequence of the frequency with which the water has been let out of the Floating Harbour and that portion of the River Avon above Prince St Bridge.

That in consequence of the Feeder and the River above Princes Street Bridge being now empty your memorialists are entirely shut off from the trade of Bristol.

That whilst submitting the necessity of the Floating Harbour and Canal being emptied for the purpose of the cleansing and repairs of the same, your memorialists submit they are entitled to such relief as the City authorities can afford.

That the restoration of the Feeder Cut near the Head of the Feeder which has been disused for some years would in the opinion of your memorialists afford this relief as it would give to your memorialists access to the Tidal portion of the River Avon twice a day.

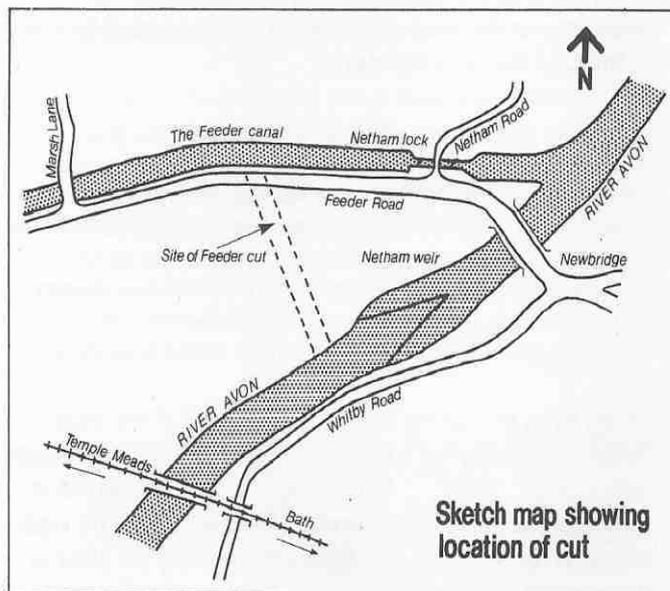
That having regard to the Docks now in course of construction at Avonmouth and the contemplated Dock Extension at Portishead the restoration of the Feeder Cut is in the opinion of your memorialists of very great importance as it would much facilitate trade by enabling Barges to proceed direct from the

Docks into the River Avon above the Feeder thereby avoiding the Port of Bristol and effecting a considerable saving in time and expense.

Your memorialists therefore pray that you will take their prayer into consideration and adopt steps to restore the Cut in question and render it fit for the use of the public."

A short, sharp reply was sent by the Docks Committee on 5 June 1871, and there the story of the re-opening attempt would appear to end:- 'It was resolved that the memorialists be informed that in the opinion of the Committee no benefit to trade would arise by the restoration of the Feeder Cut near the head of the Feeder.'

The land was sold off for industrial purposes, though the part of the lock cut nearest the Feeder is thought to have been used as a loading dock for some years, and from a passing boat or the Barton Hill bank one can just make out where this passed beneath Feeder Road,



Sketch map showing location of cut

### References

- 1 'The Hydraulic System in Bristol City Docks'. *BIAS Journal* 12, 1979.
- 2 *The Life of Isambard Kingdom Brunel, Civil Engineer*, By Isambard Brunel. Longmans Green, 1870, pp428-433.
- 3 Bristol Docks Engineers Reports volume 1.1.1880-31. 12.1882 pp 165 and 169-176 contain all passages quoted.
- 4 Assumption based on photographic evidence. See R A Buchanan 'I K Brunel and the Port of Bristol' in *Trans Newcomen Soc* vol XLII 1969-70, p 53.
- 5 See Hadfield, Charles and Skempton, A W *William Jessop, Engineer*. David and Charles, 1979, p 223.
- 6 Appears on 1st ed OS map 1 ins to the mile. Early large scale OS maps refer to it as 'disused lock'.
- 7 All quotations are from Docks Committee Minutes for the dates mentioned.