Bristol and the Optical Telegraph

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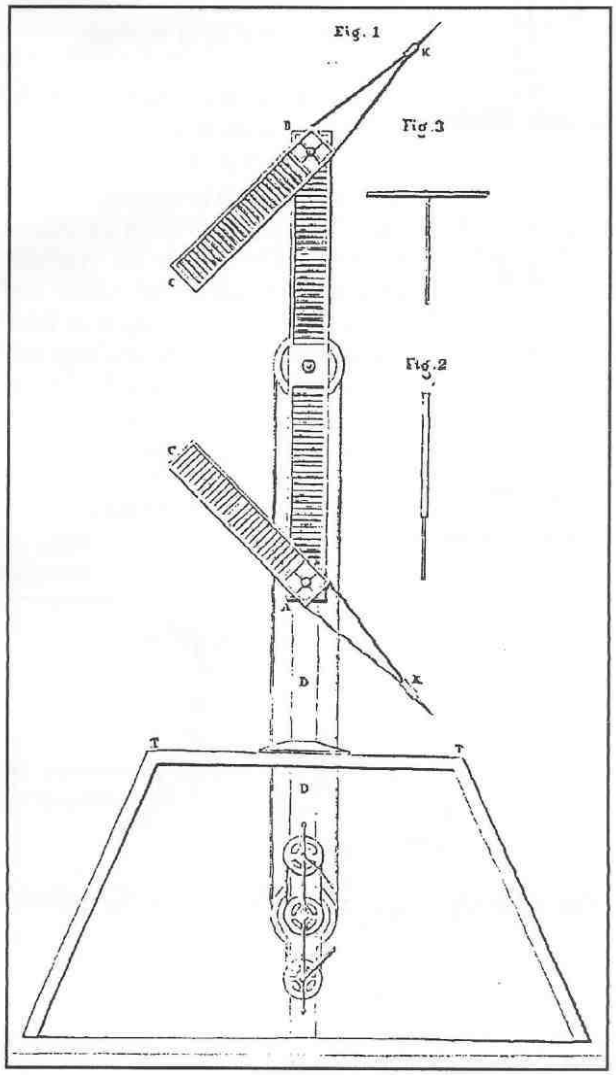
The optical telegraph must have been sufficiently familiar to Charles Dickens' readers for him to describe Mr Dick in David Copperfield as *'making a, veritable telegraph of himself'* by his gesticulations to Miss Betsy Trotwood. Today, the metaphor is likely to fall flat, and it would perhaps be as well to begin with a description of the telegraphs which once connected the Admiralty in London with the principal naval stations.

Chappe's Telegraph

The visual telegraph originated in the mind of a Frenchman, Claude Chappe, who was born on 23 December 1763.[1] Chappe began by considering the practicality of an electric telegraph, but electricity was not understood sufficiently well at the time for such a system to be possible. After trying a number of rather impracticable ideas for a visual telegraph, he came up with an elaboration of the semaphore principle, which was accepted by the French National Convention in 1793.



Chappe's telegraph of 1793

The Revolution had resulted in war between France and most of her neighbours and the new telegraph held forth the promise of rapid communication between Paris and the military commanders in the field. By Augustl7 94 a line of 15 stations connected Paris with Lille, 120 miles to the north. It was extended in the same year to St. Omer; to Brussels in 1807 ; to Antwerp in 1809 and to Amsterdam in 1810. Other lines were brought into service as follows:

Paris - Metz - Strasbourg, 1798. Extended from Metz to Mayence, 1813 .

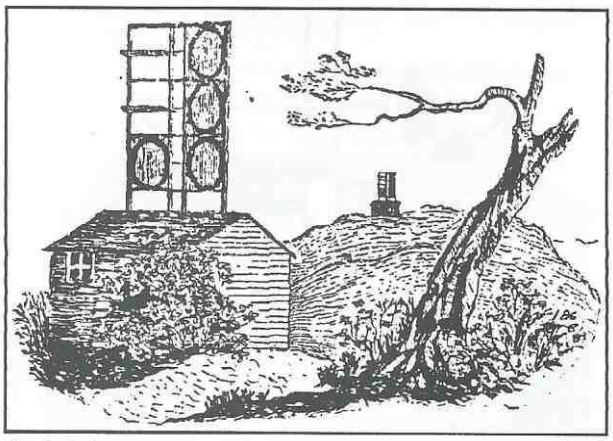
Paris - Brest, 1798.

Paris - Dijon - Lyon, 1805. Extended to Milan and Turin, 1809 and to Venice in 1810.[2]

The telegraph apparatus consisted of a stout vertical member, which at its upper end carried a beam pivoted at its mid-point. The beam could be horizontal or inclined one way or the other. This was known as the *Régulateur.* Pivoted at the ends of the *Régulateur* were two shorter arms, like those of a railway signal, which could be rotated to one of eight different positions 45° apart. A system of ropes and pulleys enabled the operator, who stood in a chamber below, to manipulate these three members, so relaying each signal made by the preceding station on to the next. 196 difierent combinations were available.

The British Shutter Telegraph

It did not take the British Admiralty long to see the value of the French telegraph and set about building one of its own. The system which it adopted was, however, quite different from Chappe's, and was devised by Lord George Murray, who, incidentally, later became Bishop of St. Davids.[3] His apparatus consisted of a stout vertical framework, on which were pivoted six rectangular shutters, which could be rotated independently about a horizontal axis. They were arranged in three pairs, one above the other, giving the appearance of the dots on the 'six' face of a dice. When a shutter was vertical, it could be seen at a distant station, but if the operator pulled a rope it could move to the horizontal position, in which it became in-



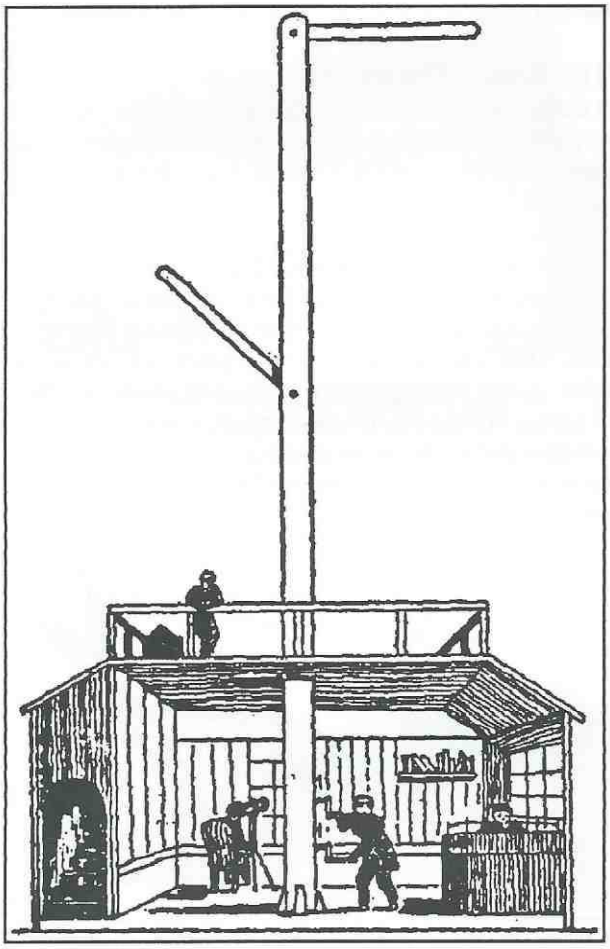
Artist's impression of the Nunhead telegraph station with its Murray designed shutters

visible. 63 combinations were available.
A line from London to Deal was opened in 1796, one to Portsmouth was working 1798, and lines to Plymouth (diverging from the Portsmouth line at Beacon Hill, near South Harting) and Yarmouth opened in 1806 and 1808 respectively.[4]

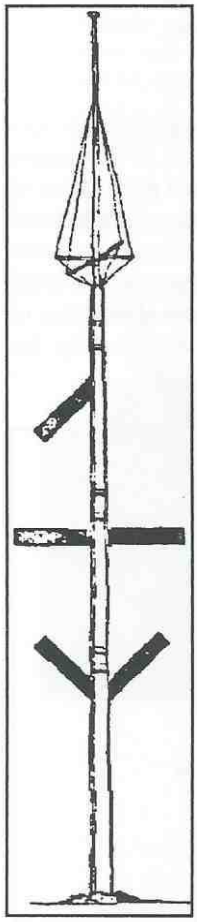
Following the signing of the Peace of Paris on 30 May 1814 all four lines were closed and although they would have served a useful purpose during the 'Hundred Days' which followed Napoleon's escape from Elba, there was insufficient time to get them working again.

Popham's Semaphore Telegraph
Not long after the final defeat of Napoleon at Waterloo, plans were made to resurrect the telegraph using an improved form of apparatus devised by Rear-Admiral Sir Home Popham. It had a vertical mast, on which were mounted two semaphore arms, one above the other. 48 different signals could be made.
A line to Chatham was opened in 1816. It was closed in 1822 and the equipment was transferred to a new line to Portsmouth, which was opened in 1824. Work on an extension to Plymouth was dropped before completion.[5]

During the first half of the nineteenth century an increased understanding of electricity and the rise of electro-technology reached the point where the electric telegraph became a practical possibility. A line using Cooke and Wheatstone instruments was laid to Portsmouth along the London & South Western Railway and, when it was brought into service on 31 December 1847, the era of the optical telegraph came to an end.[6]

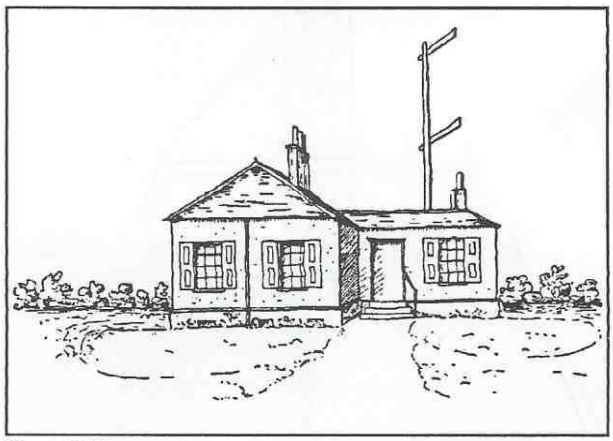

Semaphore telegraph room at the Admiralty

Commercial Optical Telegraphs
The Admiralty telegraphs were never used for anything but official communications. The electric telegraph developed very much hand-in-hand with the railways, whose working it greatly facilitated. The railways, in turn, stimulated commerce and so helped to create the need for a more rapid form of civil communication.


Watson's first telegraph

Nevertheless, there was one commercial need which had existed even before the railways came into being. This was a means of signalling the approach of homeward-bound ships to the major ports. The first telegraph established for this purpose was between Holyhead end Liverpool. The line was surveyed by a 'Lieutenant B.L. Watson, R.N.', and brought into use in 1827.[7] The first vessel to be signalled was the American ship *Napoleon*. Three pairs of semaphore arms were mounted on a 27 ft mast and there was a total of 11 stations.

There is some doubt as to whether 'Lieutenant' Watson was ever a genuine naval officer at all, but he was certainly energetic in promoting the optical telegraph for civilian purposes. He initiated proposals for systems along the Liverpool & Manchester, the Grand Junction and London & Birmingham Railways. He was also instrumental in promoting a line from Spurn Head to Hull, which opened in September 1839 with five stations.[8]


Haste Hill semaphore station, Haslemere; from a sketch by E. Hassell, 1825

An Optical Telegraph for Bristol?

In due course, Watson set his sights on Bristol. But before proceeding further, it is necessary to return to 1797, when

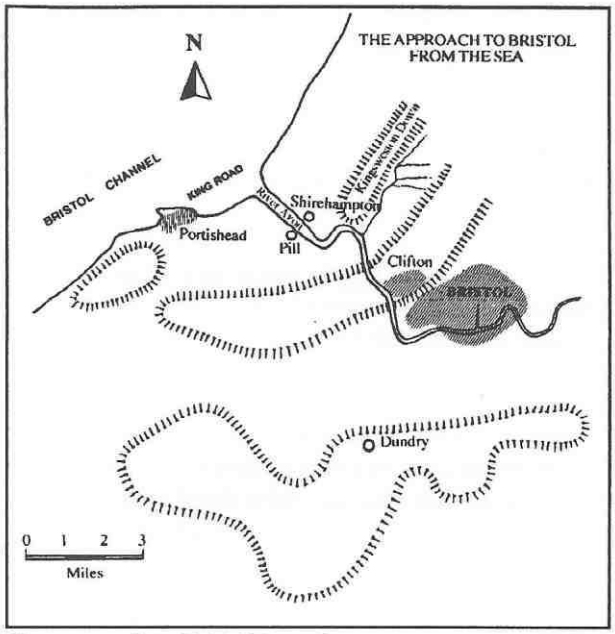
'The defenceless state of the Bristol Channel naturally created much uneasiness at a time when the French Government was constantly threatening invasion. At a meeting of the aldermanic body, in October it was resolved, to address the Admiralty, drawing attention to the fact that between Lundy Island and Kingroad there was not a single fortified point of land, and praying that a gunboat be stationed off Portishead and another in the Bristol Channel. It was also resolved to make an appeal to the Duke of York for the erection of signal posts to guard against surprise, and for the fortifying of certain points for the security of the harbour'[9]

The authorities held a deaf ear to these applications, apparently in the hope that the citizens would protect themselves. Evidently they did not do so, for in 1803:

'War with France having again broken out in the summer: the Bristol volunteers, who had been disbanded with scant courtesy after the Peace of Amiens, forgot the affront, and were forthwith reorganised, a subscription of several thousand pounds being raised by the citizens in support of the movement. Owing to the arrogant language of Napoleon, and his stupendous preparations for invading England, the ardour shown in defence of the country rose to enthusiasm...
....In order to make use of the waterside community, a corps of about 150 Sea Fencibles was established, having its head-quarters at Pill. The commandant was Captain Sotheby, R.N. The Common Council....offered £300 in bounties of £3 each to the first hundred sailors who volunteered to enter the Royal Navy'.

Telegraphs and beacons were erected on the principal hills of Somerset, Gloucestershire, and the neighbouring counties, and the Duke of Cumberland, who had been appointed military commandant of the Severn district, visited the city to inspect the volunteers and to *'fix on spots best calculated for the erection of batteries on the Avon'*. The Corporation voted £200 for the erection of four of these signal posts, *'fifty feet long, with halyyards'* at *'the snuff mill on Clifton Rocks, Dundry tower: Kingsweston Down, and Hobbs Hill, above Portishead battery'*, for the security of the city.[10]

These are the first references which I have found to 'signal posts' or 'telegraphs' at Bristol. Geoffrey Wilson, author of the monumental work The Old Telegraphs, is firmly of the opinion that at this time no telegraph of the standard (at this time, 'shutter') type was set up. The purpose of the alarm systems was not to transmit a variety of messages, but simply to give wrning of one specific military emergency, viz, the approach of a French naval force. This purpose could be met with something much simpler then a full-blown telegraph and his view is that it was unnecessary to provide the stations with anything more than a flag-pole and a suitable flag. The system was an



The approach to Bristol from the sea

improvisation to meet a possible emergency and, when the war against France ended, it would have been dismantled.

Indeed, the subject of telegraphs only arose again on 7 August 1839 when the town council minutes recorded that

'A letter from the President of the Chamber of Commerce, transmitting the copy of a letter from B.L. Watson Esqr. on the subject of establishing a line of Telegraph alongside the coast of the Bristol Channel on a plan similar to that adopted at Liverpool and in progress at other ports was read and ordered to be referred to the consideration of the Port Charges Committee'.[11]

On 13 December, the council heard the report of the Port Charges Committee:

'With reference to a communication made by the Chamber of Commerce to the Council and referred to this Committee relative to the Establishment of a line of Telegraphs along the coast in the Bristol Channel similar to that adopted at Liverpool and other ports, your Committee is of opinion that it would be highly desirable that the Survey proposed by the communication referred to should be made, but in the present state of the Borough Fund, the Committee cannot recommend its adoption '.[12]

A little more light on the subject, together with an indication of the direction in which the wind was blowing is provided by the *Bristol Mirror* of l4 December 1839:

'PORT CHARGES COMMITTEE

The Committee....stated that it was desirable to have a telegraphic communication from the mouth of the river to the city, and recommend the adoption of that plan as soon as the borough fund would admit it. Mr Herapath referred to the present plan of having electric telegraphs, and thought it would be desirable to

have one upon that principle in Bristol. It might be made to act in the Commercial Rooms. The report ... was unanimously adopted'.

Nothing further is recorded in the minutes up to January 1848, by which time, of course, the superiority of the electric telegraph had been established.

The 1853 Bristol Directory refers to a telegraph from Shirehampton to the city:

'BRISTOL AND SHIREHAMPTON ELECTRIC TELEGRAPH
Instantaneous communication is established between SHIREHAMPTON and the COMMERCIA ROOMS - by which arrivals in the Channel are reported. The public can also be accommodated at a moderate charge'.

The committee of the Commercial Rooms contributed £30 per annum towards the maintenance of the circuit.[13] Rather surprisingly, the circuit crossed the River Avon by submarine cable *'at a point adjacent to Pill and Shirehampton'*.14

As the telegraph is known to have ended the activities of the 'Pill Warner',[15] who had conveyed knowledge of the arrival of ships to the city, it appears most unlikely that an optical telegraph could ever have been established at all. All the same, there remains one faint glimmer of hope. Geoffrey Wilson quotes as follows:

'In a letter to the Nautical Magazine, Vol I, (I842) 'Semaphore' wrote that
'the telegraph at Durdham Downs, near Bristol, which has been several years in practice, I believe, confines its intelligence solely to the steam vessels belonging to the companies of that city'.

No other clues have yet come to light. A station on Durdham Down might well have communicated with Steep Holm or Flat Holm, and one can fancy other likely sites overlooking the Bristol Channel, but all is conjecture and the annals of this great port of the West, rich in other material, are apparently mute on the point.[16]

Conclusion

It would have been gratifying to be able to establish the existence of an optical telegraph at Bristol, but the great weight of evidence is against it. *'Several years'* prior to 1842 would take us back to around December 1839, when the provision of a telegraph was discussed, but postponed indefinitely. Furthermore, there is evidence that opinion was inclining more towards the electric telegraph. It seems to me most likely that 'Semaphore' mistook the will for the deed. Supposing, however, that some signalling system really did exist in 1842; if it did no more than signal the approach of Bristol owned steamships, a single flag, or at most, a hoist of two or three, would have been adequate for the purpose.

Finally, I would observe that, quite understandably, the forms of signal used by all means of optical signalling were essentially *patterns in space*. In reading the signals, it was therefore necessary to be able to differentiate configuration, be it on flags, or of the telegraph elements. It never occurred to anyone that a pattern in time might be better. All that would then be required was the ability to differentiate the 'marking or 'spacing' conditions, such as the shining or extinction of the light from a lamp. Even the early five-needle electric telegraph still stuck to the 'pattern-in-space' principle. The change to a *pattern in time*, exemplified by the Morse Code, marks a very important divide in telecommunications practice, which is not generally recognised. It was at that point that electric telegraphy became really practicable. Nowadays, every form of telecommunication transmits information as a pattern in time, including television and fax, which are essentially spatial in character.

Acknowledgement

The author and editor are most grateful to Geoffrey Wilson for permission to reproduce all the illustrations, with the exception of that of the Chappe Telegraph.

References

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3. Wilson, G., The Old Telegraphs (Chichester, 1976) 13
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10. Latimer, note 9, III 21
11. City of Bristol Records Office (BRO), Town Council Minutes, 7 August 1839, 75
12. BRO, note 11, 13 December 1839, 212
13. Tombs, R.C., The Bristol Royal Mail (Bristol, 1899) 199
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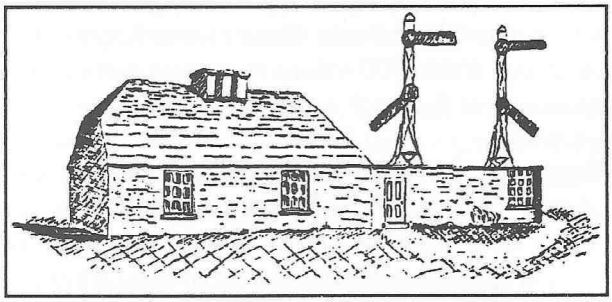
15. Powell, A.G., Bristol Commercial Rooms 1811 - 1951 (Bristol, 1951) 25.
    The Warner rode to Bristol on horseback to announce the arrival of a vessel in Kingroad. His stipend was £30 p.a., and the merchant concerned paid him a guinea.
16. Wilson, note 3, 85



Llysfaen Station, Holyhead-Liverpool Telegraph, showing the later twin lattice posts of wrought iron work 18ft high and 13 ft apart which were installed in 1841to replace the original masts