

HISTORICAL NOTE

The introduction of ether anaesthesia to Great Britain

1. How the news was carried from Boston, Massachusetts to Gower Street, London

RICHARD H. ELLIS

The first successful public demonstration of ether as a general anaesthetic was in Boston, Massachusetts in 1846 and the way in which the news was conveyed to Britain has been described in outline many times.^{1–13} Without doubt the information would have reached Britain sooner rather than later but the precise way in which the news was transmitted was not as haphazard or ill-defined as many of the existing accounts indicate.

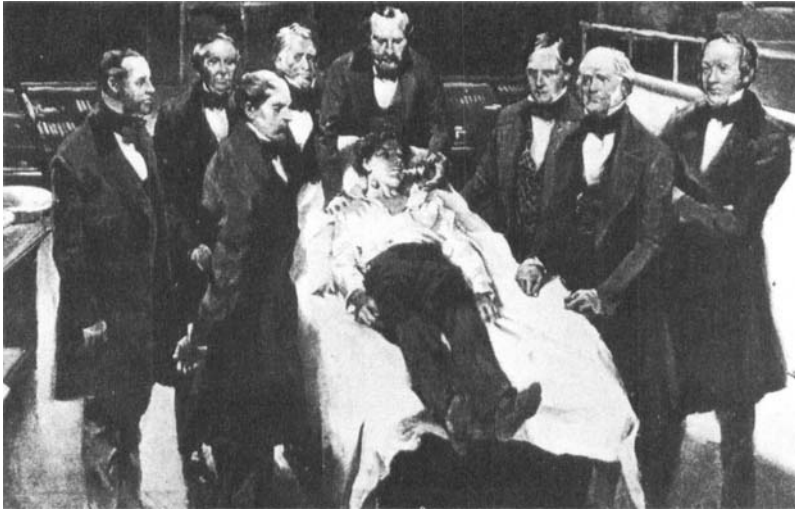
Morton and the Bigelows in Boston

William Thomas Green Morton (1819–68), a Boston dentist, established general anaesthesia when he was called upon to administer ether in public to Gilbert Abbott for the removal of a tumour from below the left side of his jaw.¹⁴ The operation was undertaken by John Collins Warren, who was the leading surgeon of his day and Professor of Surgery at Harvard University; it took place on Friday 16 October 1846 at the Massachusetts' General Hospital. Many of Boston's leading medical men were present, some of whom appeared in the famous daguerreotype depicting the occasion (Fig. 1). Although not included in the illustration, Professor Jacob Bigelow was also present¹⁵ as well as Dr Henry Bigelow.

Morton's administration of the ether was successful and, clearly, several of those present, especially the Bigelows, regarded it as their duty to spread the news abroad even though Morton's own initial reaction had been to disguise the true nature of his ether (which he called 'Letheon'¹⁶) and to patent its use.¹⁷

Morton was severely criticised for this attempt to patent his preparation¹⁸ which undoubtedly disenchanted many who might otherwise have supported his claim to have been the true discoverer of anaesthesia rather than Horace Wells, Crawford Long or Charles Jackson. However, even in America, dentistry had, at that time, scarcely become a disciplined or ethical profession and it was common practice for dentists, on both sides of the Atlantic, to patent mechanical devices which they had invented and which had been of benefit in their own practices.^{19,20}

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DR J. MASON WARREN DR S. D. TOWNSEND

By courtesy of the Wellcome Historical Medical Museum.

Fig. 1. An illustration depicting the first public demonstration of ether, at the Massachusetts' General Hospital, Boston on 16 October 1846. Although this reconstruction is one of the classical pictures of the event, there are at least two inconsistent features. Firstly, Morton looks much older than his age at the time (in 1846 he was only 27 years old) and, secondly, the case notes¹⁴ and most other accounts record that the tumour was on the left side of Gilbert Abbott's neck, not on the right as in the illustration.

Henry Bigelow (1818–1890) was a surgeon at the Massachusetts' General Hospital and later became Professor of Surgery at Harvard University. He witnessed Morton's etherisation and had always encouraged the dentist in its use. He reported the case of Gilbert Abbott to a meeting of the American Academy of Arts and Sciences⁵ and also read a detailed paper on the subject before the Boston Society of Medical Improvement on Tuesday 10 November 1846. This paper was published 8 days later in the *Boston Medical and Surgical Journal*²¹ and that account was reprinted in full on the following day in the *Boston Daily Advertiser*.

*Professor Jacob Bigelow*²² (1786–1879), Henry Bigelow's father, was Visiting Physician to the Hospital, an authority on medical botany and Professor of *Materia Medica* at Harvard. He was also one of America's leading Botanists and of international repute; it is because of this fact that the news of anaesthesia spread from America to Britain in the way in which it did.

The despatch of the news to Europe

Jacob Bigelow wrote to his ex-patriate friend and colleague, Dr Francis Boott, then living in London, on 28 November 1846. He described man's new-found ability to abolish regularly and safely the pain of surgical operations:

My dear Boott,

I send you an account of a new anodyne process lately introduced here, which promises to be one of the important discoveries of the present age. It has rendered many patients insensible to pain during surgical operations, and other causes of

suffering. Limbs and breasts have been amputated, arteries tied, tumours extirpated, and many hundreds of teeth extracted, without any consciousness of the least pain on the part of the patient.

The inventor is Dr Morton, a dentist of this city, and the process consists of the inhalation of the vapour of ether to the point of intoxication. I send you the *Boston Daily Advertiser*, which contains an article written by my son Henry, and which is extracted from a medical journal, relating to the discovery.

Let me give you an example. I took my daughter Mary last week, to Dr Morton's rooms, to have a tooth extracted. She inhaled the ether about 1 minute, and fell asleep instantly in the chair. A molar tooth was then extracted, without the slightest movement of a muscle or fibre. In another minute she awoke, smiled, said the tooth was not out, had felt no pain, nor had the slightest knowledge of the extraction. It was an entire illusion.

The newspaper will give you the details up to its date, since which other operations have been performed with uniform success.²³

It will be noted that an interval of a little over 6 weeks elapsed between Morton's first case and the despatch of the news to Britain. This delay may be explained, firstly, by the Bigelows' cautious approach which demanded that further and more major operations, especially amputation of the leg (to say nothing of dental extraction in a very close relative), be carried out under ether to prove the safety and effectiveness of anaesthesia²⁴ and, secondly, the determination of the surgeons of the Massachusetts' General Hospital not to endorse the 'Letheon' publicly until they knew of its composition.²⁵ Further, Jacob Bigelow wished to include, with his letter to Francis Boott, a copy of his son's article on 'Insensibility during Surgical Operations produced by Inhalation'. He sent the copy of the *Boston Daily Advertiser*, dated Thursday 19 November 1846, in which Henry Bigelow's paper was reprinted.

Trans-Atlantic shipping in the 1840s

At that time mail from Boston to England could travel either by sailing vessel or by one of Samuel Cunard's steam packets with which, in 1840, he had inaugurated the first, regular, all-the-year-round, trans-Atlantic steamship service. Cunard operated a monthly service during the winter and Jacob Bigelow sent his letter by the next steamer to leave Boston—the paddle steamer '*Acadia*'. By delaying his letter to Boott until the 28th November he ensured that he could report the very latest developments in the story and, by choosing the steamship service rather than the sailing packet, he made certain that his letter would be delivered as soon as possible.

The average journey time for the steamers was about 2 weeks whereas the sailing ships, depending more on the weather, sometimes took up to 5 weeks to make the trans-Atlantic crossing.²⁶

Joseph Howe, a leading Nova Scotian, described how the steamship '*Sirius*' in mid-Atlantic overhauled the sailing packet '*Tyrian*' on which he was travelling to England. 'On she came in gallant style with the speed of a hunter, while we were moving with the rapidity of an ox-cart loaded with marsh mud.'²⁷ The captain of the '*Tyrian*' transferred his mails to the '*Sirius*' to speed their delivery.

Encouraged by Howe and others Samuel Cunard, a native of Halifax (Nova Scotia), had won the British Government's North Atlantic mail contract against

stiff opposition and started his packet service with four, virtually identical paddle steamers named '*Britannia*', '*Caledonia*', '*Acadia*' and '*Columbia*'. The contract required that the ships convey mails between Liverpool and Halifax (a port which had increased in importance during the American War of Independence when it had been the principal harbour to which the British forces had access), but Cunard arranged to complete each trans-Atlantic voyage at Boston having touched at Halifax. It is clear that he appreciated the importance of the route between Britain and America but was content to run his ships by way of Halifax since this was a condition of the Admiralty's contract on which he depended and, also, it ensured that his early vessels could refuel there rather than risk running out of coal during the longer direct journey to Boston.²⁸ In the mid-1840s Boston was one of the main ports on the eastern American coast and rivalled New York commercially, economically, culturally and socially. Soon afterwards, however, the advent of an efficient railway system gave prominence to New York at the expense of Boston which thereafter became something of a commercial backwater.

'Acadia' was the name by which the early settlers knew the French colonies on the north American seaboard in the seventeenth and eighteenth centuries. These territories included that part which eventually came under British control as Nova Scotia in 1713.²⁹ Cunard's paddle steamer '*Acadia*' was the second of his fleet to be launched and, on her maiden voyage, briefly captured the Blue Riband of the Atlantic from her pioneer sister-ship the '*Britannia*' by crossing to Halifax in 11 days and 4 hours.

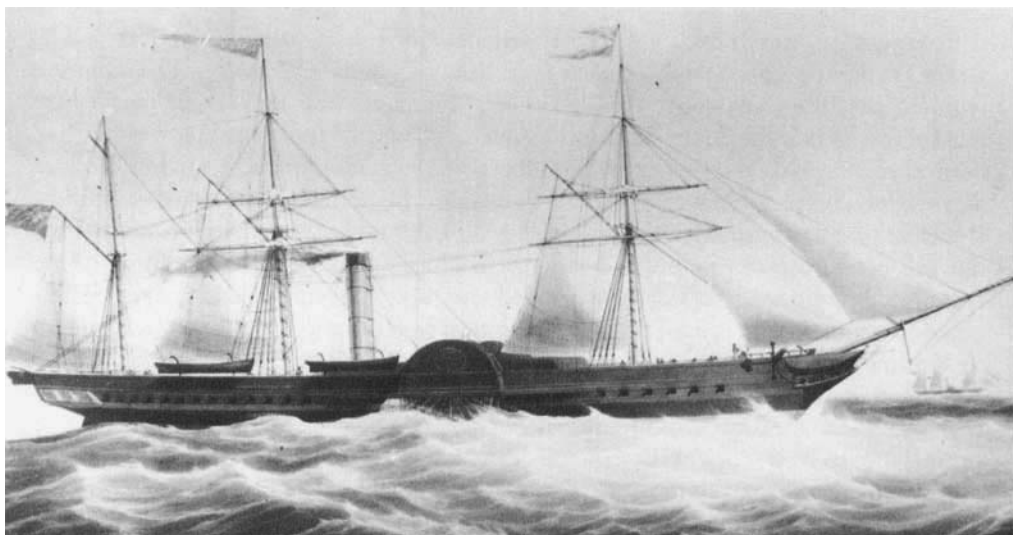
Considerable uncertainty existed in the early days of trans-Atlantic steamers about the most suitable design for the vessels and whether they should have the lines of a sailing boat, a rowing boat or even a Thames wherry.³⁰ This uncertainty was fostered by a series of steamship disasters in the North Atlantic; the '*President*' disappeared without trace and the loss of 136 passengers and crew in 1841 and '*Sirius*' was wrecked with the loss of 20 lives in 1847. Cunard's own '*Columbia*' was destroyed in 1843 although, apparently, the Captain was commended for having conducted a model shipwreck since no lives or mail were lost.³¹ The passengers who sailed on these early steamboats were regarded as brave by some and foolhardy by others.

The paddle steamer '*Acadia*'

Few records exist of these early vessels but Charles Dickens wrote an amusing account of a crossing he made in the winter of 1841–42 on the sistership of the '*Acadia*', '*Britannia*'.³²

The '*Acadia*' (Fig. 2) carried up to 115 passengers and had a crew of 89 including 12 stewards and stewardesses who looked after the passengers. There were two decks on the upper of which were the officers' quarters (including that of the ship's surgeon) a galley, a bakery, the capstan gallery and a wheelhouse in which there were always several seamen to hold the wheel steady; in bad weather these men were often injured by the wheel as it was spun by the force of the sea.

Near the stern of the upper deck was the cow-house in which all the early long-distance steamers carried a cow to provide fresh milk during the voyage. 'As regards this poor animal, which was certainly an involuntary passenger', wrote William Chambers, one of the founders of Chambers's Journal and Chambers's Encyclopaedia who made a crossing in one of Cunard's early boats, 'I observed that she was carefully



By courtesy of the National Maritime Museum, London.

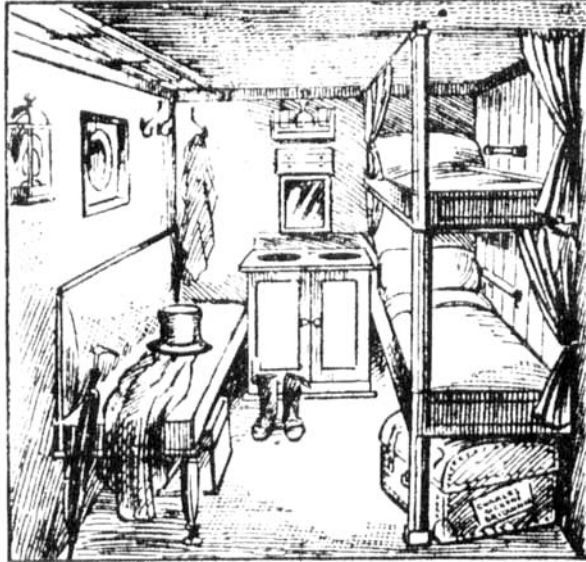
Fig. 2. The wooden-hulled, paddle steamer '*Acadia*' owned by the British and North American Steamship Company (synonymous, virtually from its beginnings with the Cunard Company), built by John Wood of Glasgow and launched in April, 1840. She was 228 feet overall and 34 feet wide with a clipper bow and a figurehead, one tall, red funnel and three masts bearing barque-rigged auxiliary sails. Each paddle wheel was 28 feet in diameter and, turning at 16 revolutions per minute, gave the vessel her average speed of $8\frac{1}{2}$ knots; she used 37 tons of coal a day.

attended to in the way of food and cleanliness; nor did she feel the want of company; for most persons talk to her in passing her little house, over the half door of which she keeps her head poked out to see what is going on, and to receive the caresses of the sailors. In rough weather she lies down in a comfortable bed of straw, and is untouched by the spray of the sea; yet, she is sometimes sick, and on such occasions, like others on board, probably wishes she were safe on dry land.¹³³

Other food was kept as fresh as possible by storing it on the decks under the ship's boats and both Dickens and Chambers found the Cunard service, meals, wines and liquor to their liking. Meals were taken in the Saloon which, together with the ladies' day cabin and the passengers' cabins, was on the main deck below. Dickens disliked the saloon and first described it as 'not unlike a gigantic hearse with windows in the sides; having at the upper end a melancholy stove, at which three or four chilly stewards were warming their hands; while on either side, extending down its whole dreary length, was a long, long table, over each of which a rack, fixed to the low roof, and stuck full of drinking-glasses and cruet-stands, hinted dismally at rolling seas and heavy weather.' Dickens had the misfortune to experience one of the stormiest crossings ever made by any of the paddle-steamers on the Atlantic and his voyage is described by him in the terms of those Britons who, having suffered untold discomforts at sea, elect to embellish accounts of their worst moments with humour. Nonetheless, Dickens cancelled his return voyage by steamship and travelled home by the infinitely more comfortable, if slow, American sailing packet '*George Washington*' and incorporated all the worst features of his own experiences in '*Britannia*' into his description of life aboard the '*Screw*', a trans-Atlantic packet featured in '*Martin Chuzzlewit*', his next novel. According to Chambers even in unexceptional seas the

vessels tended to ship water, and this made the main day-time preoccupation of relaxing on deck unpleasant.

No one dressed for dinner which was the only meal of the day at which the Captain dined with the passengers. After dinner, the time was spent in conversation and playing cards and, Dickens records, that it was usual for the ship's surgeon to be invited to join in. The passengers' cabins (even then euphemistically called state-rooms) were described as luxurious and spacious by Cunard's agents in London, but Dickens



By courtesy of the 'Daily Telegraph'.

Fig. 3. The appearance of one of the passenger cabins aboard the 'Acadia' and her three sister-ships. This was the 'State-room' occupied by Charles Dickens and his wife during their first trans-Atlantic crossing in January, 1842. The illustration almost certainly exaggerates the size of the 8' x 6' cabin as much as Dickens felt Cunard's agents in London had.³²

found that they leaked sea-water and were minute and spartan. Each measured about 8 feet by 6 feet (2.4 x 1.8 m) and, as can be seen in Fig. 3, which exaggerates the size, the furnishings were sparse. There were two berths, one above the other 'than which', wrote Dickens, 'nothing smaller for sleeping in was ever made except coffins'. Each thin mattress was 'spread like a surgical plaster on a most inaccessible shelf'. The cabins were lit at night by a hurricane candle which was extinguished at midnight to lessen the risk of fire.

The news of anaesthesia arrives in Europe

Having waited for the very latest mails to be put aboard, the 'Acadia' sailed from Cunard's dock at Boston on 3 December 1846 and, passing her sistership 'Caledonia' on the way³⁴, steamed to Halifax to coal and pick up Canadian passengers and mail before setting out for Liverpool. It is clear that the vessel carried the news of Morton's successful use of ether in several ways.

Bigelow's letter to Francis Boott

Jacob Bigelow's letter was safely aboard, either as a regular 'ship letter' or, since it

was a bulky package containing a whole newspaper, in the personal baggage of one of the passengers or crew. The carriage of mail was expensive and, even in 1840, the charge for a single page letter was one shilling and a double page letter cost twice as much.³⁵ As a result, many passengers before embarking were given letters by friends or colleagues to carry with them for personal delivery or to be posted when the ship arrived at its destination.

However it was carried, the letter was delivered to Francis Boott in London on 17 December,¹ the day after the *'Acadia'* docked. Boott immediately sent the *Lancet* a copy of part of this letter²³ together with the text of Henry Bigelow's article from the *Boston Daily Advertiser*.

He also arranged with his friend and neighbour, the dentist James Robinson, to carry out experiments with ether inhalation; as a result of these ether was first administered in England on Saturday 19 December (the same day as it was used in Dumfries³⁶) by Robinson at Boott's house.²³

Boott's second letter from Boston

Boott also received a second communication from Boston in which was enclosed the text of a speech by Edward Everett, made at the recent opening of the Medical College in Boston. This included a reference to anaesthesia with ether.

Everett had been American Ambassador to the Court of St James from 1840 to 1845³⁷ and was probably well known to Boott since, for a time, he had been Physician to the Embassy in London.³⁸ Boott despatched this further information from Boston on ether to the *Lancet* together with a characteristically modest account of his and Robinson's use of ether on 19 December.²³

This second letter to Boott arrived separately from, and a few days after, Bigelow's package but clearly must have been brought over on the *'Acadia'*. The fact that these two letters arrived at different times lends support to the theory that at least one of Boott's letters from Boston travelled amongst one of the passengers effects rather than by the official ship mail. Had both letters been consigned to the 'ship letter' system they would, presumably, have arrived at their destination in London together.

The ship's surgeon—William Fraser of Dumfries

By the time the *'Acadia'* docked at Liverpool the ship's doctor, William Fraser, had learnt about Morton's discovery, probably during the voyage although there is a suggestion that he met Morton in person.³⁶ Whether or not that was so, when the ship arrived in port, Fraser hastened to his home in Dumfries and there persuaded his surgical colleagues to operate on a patient under ether on Saturday 19 December.³⁶ No details of the surgery exist but the ether was administered with an apparatus which resembled Morton's, having been 'hastily assembled by Dr Fraser'.³⁹

Edward Warren, en route to France

One previous account asserted⁴⁰ that an Edward Warren was also aboard the *'Acadia'* during its December voyage. This man was very probably, as recorded in that account, a relative of the Boston surgeon Professor Warren⁴¹ and was Morton's agent who was travelling to France where he intended to patent Morton's discovery

on behalf of the Boston dentist. If Edward Warren was making the voyage it is highly likely that he had with him a Morton's inhaler since one reached France at some time between mid-December, when an unsuccessful demonstration (without the inhaler) took place and 23 January 1847 when an inhaler was used successfully.⁴²

It is tempting (but entirely speculative) to suggest that Fraser learnt about ether during the voyage from Edward Warren who also showed him the inhaler which he was taking to France; as a result of this Fraser would have been able to improvise the apparatus resembling Morton's which was used in Dumfries. Equally possible, but equally speculative, is the suggestion that Fraser, while in Boston, met Morton, Bigelow or one of the others involved in the early American anaesthetics.

A hearsay account

There may well have been other letters referring to anaesthesia or other people with particular knowledge of the subject aboard the '*Acadia*', but nothing exists to substantiate this.

The news of ether in Boston must, almost certainly, have been discussed by William Fraser and some of the passengers during the *Acadia's* voyage and must have been spread by someone aboard by word of mouth when the vessel arrived in the Mersey, on Wednesday 16 December, as a brief, preliminary account appeared in the *Liverpool Mercury* 2 days later. It is not known how this small, local newspaper obtained the information but it was common practice for reporters to try and discover overseas news as early as possible by questioning those arriving from America whenever the vessels arrived in port.

Another brief and surprisingly early sketch of the events in Boston was published in the *London Medical Gazette* on the 26 December. Again it is not known how the *Gazette* acquired its information but the most likely explanation must be that Francis Boott forwarded the details (as he did to the *Lancet*), soon after Bigelow's letter had completed the final part of its journey by rail from Liverpool to London.

Liverpool to London

On arrival in the Mersey (Fig. 4) the '*Acadia*' dropped anchor and the passengers, mails and light luggage were taken off by tender while the steamer, because of its size, waited for the next high tide in order to enter the Coburg Dock.*

The incoming mails usually amounted to some two cartloads of well-stuffed leather bags³³ and these were taken to the Liverpool Post Office for sorting. Those destined for London were sent to the station in Lime Street and put aboard the London mail train (Fig. 5). In 1846 the London and North Western Railway had been formed by the amalgamation of several independent companies, including the Grand Junction Railway and the London and Birmingham Railway. The route taken by the train⁴⁷ which carried the *Acadia's* London bound mail was, as will be seen from the Post Office's schedule (Fig. 6), essentially the same as that used today.

In the 1840s the 210 miles between Liverpool and London were covered at an

* The '*Acadia*' disappears from the narrative at this point. She continued Cunard's North Atlantic service until 1849 when she was sold to the German Navy and used as a frigate. In 1853 she was restored as a passenger ship and re-named '*Germania*'⁴³ and in 1855 was chartered to the British Government for use as a Crimean War transport. This was an ignominious period in the ship's life as the majority of these vessels were dirty, rat-infested and generally unsuitable for the sick.⁴⁴ She was finally scrapped in London during 1858.⁴⁵

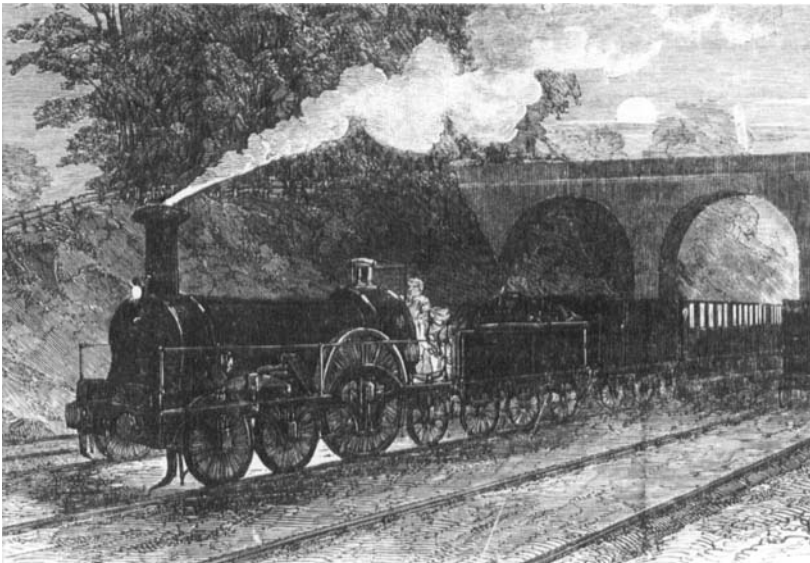


By courtesy of the Liverpool Public Libraries.

Fig. 4. The port of Liverpool and the River Mersey, seen from Birkenhead, around the middle of the nineteenth century.

average speed of just under 18 miles per hour and the journey took some 12 hours. When the train reached Camden at the London end of its journey the locomotive was detached and the carriages allowed to coast at less than 10 miles per hour down the steep incline to the terminus at Euston Square (Fig. 7). At this time only 22 trains ran in and out of the station each day and there were merely two wooden platforms, one for arrivals and the other for departures. Nonetheless, Euston already boasted the famous Doric arch and screen which was erected by Hardwick before the station opened in 1837.⁴⁷

Mail trains were met by Post Office officials who immediately took the mail bags from the station on a two-mile journey by horse-drawn cart to the General Post Office in central London. Here it was finally sorted and the letters from Boston



By courtesy of the Post Office.

Fig. 5. A mail train of 1849.



GENERAL POST-OFFICE.

The EARL OF LICHFIELD, Her Majesty's Postmaster-General.

LIVERPOOL, BIRMINGHAM, AND LONDON RAILWAY TIME BILL.

Liverpool, Birmingham, and London.

| Eighteen Miles an Hour. | M. V. | Time allowed. H. M. | Despatched from the Post-Office, <i>Liverpool</i> , the 183 , at at | of by Time-Piece by Clock |
|----------------------------|--------|---------------------------|---|---|
| | | | <i>6.15 P.M.</i> | |
| | | | | (With a Time-Piece safe { No. to |
| | | | Left the Rail Way Station, at | |
| | 19. 2 | 1 | Arrived at <i>Warrington</i> , at | <i>7.15</i> |
| | 5. 4 | | <i>Preston Brook</i> | |
| | 6. 6 | 39 | Arrived at <i>Hartford</i> , at | <i>7.54</i> |
| | 4. 4 | | <i>Winsford</i> | |
| | 7. 2 | 35 | Arrived at <i>Crewe</i> , at | <i>8.29</i> |
| | 10. 6 | 41 | Arrived at <i>Whitmore</i> , at | <i>9.10</i> |
| | 8. 2 | | <i>Norton Bridge</i> | |
| | 5. 6 | 39 | Arrived at <i>Stafford</i> , at | <i>9.49</i> |
| | 5. 2 | | <i>Penkridge</i> | |
| | 9. 6 | 48 | Arrived at <i>Waterhampton</i> , at | <i>10.37</i> |
| | 4. 6 | | <i>Bescot Bridge</i> | |
| | 9. 4 | 38 | Arrived at the Rail Way Station, <i>Birmingham</i> , at | <i>11.55</i> |
| | | 30 | <i>Thirty Minutes allowed.</i> | |
| | 18. 2 | 1 | Arrived at <i>Coventry</i> , at | <i>12.45</i> |
| | 10. 6 | 35 | Arrived at <i>Rugby</i> , at | <i>1.20</i> |
| | 14. . | 46 | Arrived at <i>Weedon</i> , at | <i>2.6</i> |
| | 7. . | 23 | Arrived at <i>Blisworth</i> , at | <i>2.39</i> |
| | 10. . | 33 | Arrived at <i>Wolverton</i> , at | <i>3.2</i> |
| | 11. 6 | 39 | Arrived at <i>Leighton Buzzard</i> , at | <i>3.41</i> |
| | 8. 4 | 28 | Arrived at <i>Tring</i> , at | <i>4.0</i> |
| | 13. 6 | 45 | Arrived at <i>Watford</i> , at | <i>4.54</i> |
| | 17. 6 | 59 | Arrived at the Rail Way Station, <i>Euston Square</i> | <i>5.53</i> |
| | | 10 | <i>Ten Minutes allowed.</i> | |
| | 2. 2 | 18 | Arrived at the General Post-Office, the | |
| | | | 183 , at | |
| | 211. 2 | 12 6 | | <i>1.21 P.M.</i> |
| | | | | (Delivered the Time-Piece safe { No. to |

By Command of the Postmaster-General,

GEORGE STOW,

Surveyor and Superintendent

By courtesy of the Post Office.

Fig. 6. The 'time bill' of one of the mail trains which travelled between Liverpool and London in the late 1830s. The route followed is virtually the same as that of the present-day railway.

addressed to Francis Boott were then despatched for delivery by hand to his address which, on Thursday 17 December 1846, was 24 Gower Street, London.

Summary

The way in which the news of the introduction of ether anaesthesia was conveyed from Boston, Massachusetts to London in the latter part of 1846 is discussed and illustrated.

Acknowledgments

The author gratefully acknowledges the help given to him in the preparation of this



By courtesy of British Rail—London Midland Region.

Fig. 7. The two platforms of Euston Station as they would have appeared in the 1840s. The arrival platform is on the right, and that for departure on the left.

article by the librarians and staff of the Guildhall Library in the City of London, the Library of St Bartholomew's Hospital, and the Brown, Picton and Hornby Libraries in the City of Liverpool, and by Christine Parkes of the National Maritime Museum, Greenwich, Mrs McNamara of the Records Department of the Post Office in London, Mrs G. Joan Smith of the Archives Department in the University of Liverpool and Mr S.J.F. Miller of the World Ship Society.

The skilful work of Mr David Tredinnick and the members of his Department of Medical Illustration at St Bartholomew's Hospital has been invaluable as has that of Miss Angela King who provided secretarial assistance which was both resourceful and patient.

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