

JOHN DALTON'S SUMMER HOLIDAY OF 1840

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John Dalton is universally recognised as the father of modern atomic theory and Manchester justifiably considers him a glittering jewel in its scientific crown. The city has a street, a hall of residence and a passage way, 'Dalton Entry', named after him. His marble statue by Francis Chantry adorns the entrance to the Town Hall and another statue in bronze, which once stood in Piccadilly, is now in front of the John Dalton building within the Manchester Metropolitan University's campus. The Manchester Literary & Philosophical Society (Lit. & Phil.), over which he presided for twenty-seven years, bestows a Dalton medal on a distinguished scientist and the University of Manchester gives Dalton scholarships to worthy students. Dalton was born near Cocker mouth in Cumbria in 1766 but it was in Manchester, his adopted city for over fifty years, that he did his most significant work.

Dalton received fulsome recognition in his lifetime and was venerated on his death in 1844, when the City Fathers gave him a funeral fit for a monarch. Over 40,000 mourners filed past his ornate coffin as it lay in state in the old Town Hall in King Street. Shops and businesses were closed by order of the Mayor and people lined the streets in silence as the mile long funeral procession, of over a hundred carriages and many dignitaries on foot, made its way towards Ardwick Cemetery.

Yet, Dalton's memory has been marred by a sequence of mishaps and neglect at the hands of those from whom he and his admirers

would have expected better. His chosen literary executor, William Charles Henry, produced a late and inadequate biography and his papers and apparatus languished in the rooms and cupboards of the Lit. & Phil. until most of them were lost in the bombing raids of December 1840.¹ Thus the received image of Dalton is like that of an icon viewed through a pane of fractured glass; some parts are detailed and clear, while the whole is distorted. Myths and paradoxes about him abound: there is no precise knowledge as to how he arrived at his famous theory of atoms; he appears aloof from the industrial scene of Manchester which surrounded him on all sides; he was portrayed as a crusty old bachelor, unfamiliar with the trials of domestic life.

The Dalton papers salvaged from the fire of the bombing raids were eventually restored and conserved by The John Rylands Library of the University of Manchester, with the assistance of the Industrial Division (North West Region) of the Royal Society of Chemistry. I was closely involved with the project, and the restored papers went on display in the Library in 1991. A small collection of Dalton papers and letters in the possession of the descendants of the Reverend William Johns, with whose family Dalton lodged in Manchester for twenty six years, came to light a few years ago, and were generously loaned to me for research. Still, the sum of primary research material available to Dalton scholars is very small. It is hoped that one day, if not numerous at least significant parts of the jig-saw will come together to enable a truer picture of Dalton. We may yet explode some myths about him and really discover why his contemporaries loved and revered him – he was, perhaps, neither crusty nor aloof after all.

This article is based on an account from the fragmentary remains of the journal of Catherine Johns, who with her sister Elizabeth and father Reverend William Johns, accompanied Dalton on a holiday at Bolton-le-Sands near Lancaster, in the summer of 1840. They travelled by train and by a swiftboat on the Lancaster Canal. Catherine's narrative gives a rare glimpse of Dalton within the intimate circle of family and friends; it also provides a vignette of a period and of an outmoded form of travel.

Dalton was an avid traveller. Some of his surviving letters are vividly descriptive of his coach journeys. However, no letter describing travel by canal or later by rail has survived, which makes Catherine's travel log particularly useful. While rail and road still form a general mode of transport for people, canals no longer serve that purpose; so, any feel for the journey undertaken by Dalton's party has to be gained first hand. I followed Dalton's footsteps last summer along the Lancaster Canal to sense what a journey of that kind would have entailed for the seventy-four year old Dalton, who had suffered a stroke three years before. The conclusion was that Dalton had neither lost his tenacity nor his propensity for company.



Profile of John Dalton, c. 1840s
(Courtesy R.W. Jones)

Manchester: Dalton Acquires a Family

At the age of twenty-seven John Dalton came to Manchester from Kendal, where he had been running a Quaker school, to teach mathematics and natural philosophy at the Manchester New College, the successor institution to the Warrington Academy. His book on *Meteorology* was soon published and he quickly settled down into the Lit. & Phil. circle. Sponsored by Thomas Percival, Thomas Henry and Robert Owen, he was elected a member in 1794, became its Secretary in 1800 and President from 1817 until his death in 1844. The College's fortunes seemed in decline around 1800 and Dalton left to establish himself as a public lecturer, private teacher and technical consultant. He had his laboratory and workroom in the Lit. & Phil.'s new house at No. 36 George Street. In 1804, he moved in as a lodger with the family of his former colleague, the Reverend William Johns, whose house and successful Academy for boys was situated almost across the road from the Lit. & Phil. at No. 10 George Street.

The Johns became Dalton's surrogate family; their two daughters, Elizabeth and Catherine, were aged six and four respectively when Dalton joined them. Years later Catherine Johns recounted:

In the year 1799 my father received an invitation to come to reside in Manchester, as Classical Tutor in the College, & on his arrival found that Mr G Walker & Mr Dalton were his colleagues as Theological & Mathematical Tutors. Thus was an intimacy begun which has continued without interruption or change to the end of their lives, & has contributed much to the happiness of both parties. After residing 9 months in the same house, my father's removal from Manchester caused a cessation of intercourse but shortly after his return to settle finally in that town, Mr Dalton proposed himself as an inmate of the family, & was received with warm welcome, & remained there 26 years. During so long an intercourse we had many opportunities of hearing anecdotes of his youthful days though for some years he was very shy of talking of himself.²

The Reverend William Johns was born in a small village near Narbeth in Pembrokeshire into a poor farming family and brought up on strict Calvinist lines. He grew up speaking only Welsh but was inspired by Latin and Greek studies and became a proficient scholar in both languages. The Bible had moved him and determined the future course of his life. He left home and trained as a Minister at the Unitarian College in Northampton, which caused a temporary rift with his parents. During his Ministry in Totness he married Honore Sparke.

William Johns was five years younger than John Dalton but had a similar background; they both came from modest farming stock, were accustomed to physical exertion and both were physically active and of an athletic build. Johns, unlike Dalton, was a "teacher and preacher" and served as a Minister at the chapel in Sale, but like him he, too, played a leading part in the affairs of the Lit. & Phil.; he was joint Secretary with Dalton in 1807 and Vice-President from 1816 till 1822. He read several papers to the Society ranging from history to philology; he was Vice-President of the Philological Society of Manchester, being highly regarded by its founder, the

Reverend Adam Clarke, no mean scholar himself.³ William Johns' reputation attracted the sons of the leading families of Manchester to his school; these included the Murrays of Ancoats Hall, the two families of McConnells and Kennedys, the Booths and the Potters. Peter Ewart, Dr Ransome, John Shuttleworth, John Kirk from the firm of Birley, Hornby and Kirk, J.C. Dyer of Burnage, Thomas Sharp (locomotive builders), Dr Holland (Her Majesty's Inspector of Cemeteries) and many other worthies of Manchester sent their sons to be educated at the Johns Academy. William Johns had also taken into his home the three orphaned children of his brother, who had died in an accident in 1815. The twin girls, Ann and Sarah were born in 1814, and their brother John was a couple of years older. Johns had the support of Dalton in a house full of children of varying ages. Ann later married Dalton's friend James Woolley, who founded the well known chemist and druggist firm. In due course, Elizabeth and Catherine followed their father's vocation and taught the junior classes. The Johns-Dalton household became an important font of education in the area. Dalton's chosen biographer, Charles Henry, the son of his friend and collaborator, William Henry, also gained his early education within this circle.

Dalton's most creative period in science was around 1803. The study of different kinds of gases was still in its infancy and Dalton put forward his own ideas about their properties and behaviour, and laid the foundations of his atomic theory. Since his views ran counter to the accepted ideas at the time they were greeted with scepticism; he lectured at the Royal Institution in London and at Edinburgh and Glasgow. While the reception of his theory in the capital was lukewarm, he was encouraged by the scientists in Scotland. He published, in 1808, his *New System of Chemical Philosophy*, where he set out the rules for the combination of atoms, now familiar to all students of chemistry. Gradually the work of other scientists gave support to his theories and the first note of recognition came from the French Academy of Sciences in 1816; he visited Paris in 1822 and was received by the scientists with great dignity. The Royal Society of London, which had been execrably slow in honouring him, elected him a Fellow the same year and gave him the Royal Medal four years later. By now he was much in demand as a lecturer and could command a good fee; his course of lectures to the Philosophical & Literary Society of Leeds in 1823 earned him £50.⁴

Dalton also supported the cause of Manchester's coal-gas enterprise (the first one in the country to be municipally owned and run) and gave evidence on its behalf to a Parliamentary Select Committee, which sat in 1824. He acted as a consultant to the Manchester Gas Committee for many years.⁵ The French Academy of Sciences elected him a Foreign Associate in 1830; this was regarded at the time as the crowning distinction in European science. The British Association for the Advancement of Science (BAAS), which was founded in 1831, encouraged scientific activity in provincial towns. Dalton played a significant role in its early success and, in turn, was considered one of its top celebrities. At its meeting in Oxford in 1832, he was awarded DCL by the university and in 1834, Edinburgh honoured him with LL.D. Dalton was now a highly esteemed figure in Manchester, such that he could confidently tell a correspondent that a letter addressed: "'Dr Dalton, Manchester' will generally find me."⁶

All this time, he carried on his routine of teaching science and mathematics to young boys and girls, which he enjoyed thoroughly. He charged, what many considered, a paltry fee and had students coming to him from diverse backgrounds. Many of his pupils went on to become influential statesmen, scientists and industrialists. He did not, however, make a great fortune from his teaching and his supporters, worried about his financial security in old age, procured a Civil List pension of £150 for him in 1833; this was doubled three years later. Dalton seems, "by the calmness of his temper, and liberality of his views," to have steered his way through some of the turbulent times of industrial Manchester and came to be respected by all sections of society.⁷

Dalton's Recreation

Dalton's life was by no means, "all work and no play"; he and William Johns, in the company of a few other regulars, habitually played bowls every Thursday afternoon at the Dog and Partridge Inn at Old Trafford. Dalton was also an avid traveller; this was generally in keeping with the Quaker ways, but he was particularly drawn to the hills of his native Cumberland. Practically every summer, he spent two weeks walking and climbing in the Lake District. As a keen meteorologist and investigator, he made careful observations of natural phenomena; he carried simple instruments like a barometer to determine the height of a mountain, or a theodolite to ascertain the bearings, elevations and depressions of surrounding peaks. For him the joy of climbing and beholding a splendid view from the summit was inseparable from the gratification of a carefully determined dew-point on the way.

Using his portable barometer, Dalton accurately determined the height of Helvellyn - a mountain he climbed some forty times in his life. On occasions he took his friends with him; both Elizabeth and Catherine Johns accompanied him to the Lakes in the summer of 1833. From 1812, his faithful guide and companion during his visits to the Lake District was Jonathan Otley of Keswick, whose antecedents and interests were similar to his own. Otley has been described as the father of Lakeland geology; his maps and guide-books became standard works, and did much to open up these sequestered regions to a new breed of visitor, the "Tourist."⁸ His journal of excursions with Dalton was published in full by Dalton's biographer, Charles Henry, and reveals a facet of Dalton, which could not be gleaned from his scientific publications. His grit and stamina become obvious as does his childlike pleasure at climbing Scawfell Pike, the highest peak in England, and Pillar Fell for the first time. The incident of Dalton collecting gas near the floating island in Derwentwater formed the basis of the fresco painted by Ford Madox Brown in 1886 for the Town Hall in Manchester.⁹ Both Dalton and Otley were seventy years of age, when they climbed Helvellyn together for the last time in 1836. The following spring Dalton suffered an attack of paralysis. As he gradually recovered he lamented, "I long to see my native place again."¹⁰

Dalton was ever after frail and needed the help of an attendant, but his tenacity and determination did not diminish. He carried on his scientific researches as well as his duties as the President of the Lit. & Phil. The Johns family had left Manchester in 1830 for the cleaner suburb of Higher Broughton, where Catherine and her sister ran a school for young ladies. Dalton moved to a

house in Faulkner Street; there were horse drawn omnibuses running from Market Street in Manchester to Pendleton and to other suburbs from the mid 1820s, and Dalton visited his friends regularly. In the summer of 1840, William Johns, Elizabeth, Catherine and Dalton, accompanied by his man-servant, set off for a holiday at Bolton-le-Sands near Lancaster. They travelled by train and along the Lancaster Canal by the swift-boat called *Waterwitch*. Dalton, like his fellow Quakers, was enthusiastic about all forms of improvements to communication, be it roads, canals or railways. The Liverpool & Manchester Railway, which began regular passenger services on 17 September 1830, was actively supported by the 'Friends'. In fact, on the special trains, which ran between the two towns the previous day, most of the 130 passengers were Quakers travelling to the Lancashire Quarterly Meeting at Liverpool. George Bradshaw, the printer of the earliest railway time-table, was a Quaker.¹¹

The Holiday of 1840: Account from Catherine Johns' Journal (1840)²

Lively and witty, Catherine was Dalton's favourite; according to her sister, "her wit and animated nonsense, were, I fancy more to his taste."¹³ Her journal, if it had survived intact, would have been a rich source of information about Dalton. The few pages given below describe the daily events during the holiday and bring to life many facets of Dalton's personality. They give a rare glimpse of Dalton within the circle of family and friends. It is also particularly poignant, as this would be the last holiday they would all enjoy together.

1 July 1840

Father and I left home at 1/4 past 8 O'Clock & met Dr D & his man at the rail road, where we took places to Preston, the Dr having determined to stay there to see his relations. We were accordingly set down by a fly at Mr Benson's¹⁴ shop door & staid nearly 2 hours. We then came on in the Waterwitch to Bolton le Sands no incident occurring worth mentioning, but the (sic) having a restive horse, which broke over the hedge & ran into the fields, but one of the passengers disentangled the boat, liking better to swim in the water than on the dry land. When at Lancaster we learnt that the train in which we should have been, if we had not stayed in Preston had been thrown off the rails & detained 3 hours, which made us rejoice that we were not in it. The evening turning out fine we took a walk to the village after tea.

2 July

Soon after breakfast, we turned out to go to the shore, but had not proceeded far before the rain drove us home, & kept us in the house all day, the Dr attempted to go out after tea but soon returned.

3 July

Wet most of the day though we got 2 short walks one before dinner & one after tea. Dr is not afraid of damp & does not like staying in the house all day. He takes a nap every afternoon & tries to amuse himself with some of our books.

4 July

Fine morning. Father, Dr & S took a long walk thro Slyne, Hest Bank, & home. Bessy¹⁵ & I went to Lancaster to market. After

tea we all went down to the waterside by Miss Oates's house & back again, were an hour absent. The tide was partly out & the wind very strong.

5 July

We got up earlier, it being Sunday morning & a fly having been ordered to be here at 9 to take 4 to chapel put us all in a bustle. The Dr saw many of his friends at meeting & had many invitations to dinner. Mr T Dockray⁶ & his sister proposed riding over to see him. After we had a long consultation about the Dr's going to Ambleside to see Miss Taylor⁷ who is in lodgings there. He did not wish to go without Bessy and me as he said he should want company so we determined to accompany him. He is so averse to fixing up on any plan that we could not prevail on him to write that day — he would postpone it till Monday morning, tho' he would scarcely have time to write it then before post-time. We took an early cup of tea & went down to the shore at Hest Bank & round home which is about 2 1/2 miles & we were all rather tired. The Doctor told us during the evening that he once went into a shop & enquired for Dalton's grammar⁸ — the bookseller said he had not got it, but he had another which he could recommend. Dr looked at it & thought it not worth a farthing, though the price was 3/6, & still enquiring for the other the shop was searched & a dusty old parcel was brought out with a dozen which had not seen light for a long time. He likewise told us that some one, I think at Sheffield had published his grammar with some additions without acknowledgement.

6 July

Very wet this morning. Dr D busy writing to Miss Taylor & looking very wistfully at the weather.

Towards 12 O'Clock it was fine enough to go a walk & we went as far as the 4th bridge on the Kendal road. Soon after dinner the rain came on again & we were weather bound except that the Dr went out with father at 7 O'Clock for 1/2 hour though it was very damp. During the afternoon he told us he had been made tipsy at Caldbeck when he was 20 years old, by drinking one glass of rum & water on an empty stomach, there being nothing fit to eat in the home.

7 July

The morning appears finer Dr, B & S are gone out to make the best of it. We got into the boat a little before 4 O'Clock & arrived at Kendal before 7, where Dr took tea & then we set off to Ambleside in a covered car with 3 more passengers. The evening proved fine & the view delightful. Miss Taylor was at the door of her lodgings to greet the Dr. When we arrived at the inn, there were no beds & we were obliged to go to the Salutation where we got beds, but the waiter did not bring in supper till 11 O'Clock. Which kept us up till half past 12 as the Dr had to smoke his pipe afterwards. On one part of the road Dr pointed out where a large common had been enclosed, on which common he & his brother had been lost in the snow more than 50 years before & had had great difficulty in finding the road again, & were out most of the night. He was at the Salutation in the year /81 when it was a very different kind of place, with a sign on which were painted 2 persons saluting.

8 July

Were up late & went to Miss T's directly after breakfast & sat 2 hours, Dr talked a great deal about his travels with Miss T's father & brother. As we were going back we were overtaken by a heavy shower, & a lady who lived by the roadside invited us in to shelter. Dr said that Miss T was the very cleverest pupil he had ever had — she seemed to know by intuition all kinds of science, mensuration, trigonometry, fluxions & c. Botany she knew better than he did. After dinner we went there again to drink tea, & spent a very pleasant evening. In the morning of the 9th we waited for the mail which being full we took a car & came to Kendal. When we arrived we ordered dinner & went to see Miss Lickbarrows, then to the bank & after dinner Dr D said he should like to go to the Wilsons as we were going down the street Mr J.W. overtook us & said he was drinking tea out, but begged us to go on & he would follow us soon. Accordingly we went on & walked round the garden; which is a very pretty one & likewise productive. I had wished Dr to come on to Bolton but he had quietly made up his mind to stay & come by the boat the next morning.

10 July

Accordingly in the morning we set off half past 8. There were many friends some of the Wakefields.⁹ Dr D told us when we got home that one of the Wakefields died young — a very beautiful girl & that he wrote an epitaph & sent it to the newspaper but he had never mentioned it to anyone. He would walk as the boat passed thro' the locks, he had never staid in the boat & would not tho' there was great probability there might be a heavy shower. We arrived safe at home & soon after walked to the village, & in the evening took a long walk round by Hest Bank & to the Sands & on our return were caught in heavy rain & were obliged to walk fast to a barn & stay there a long time. Luckily the rain abated so as to allow us to get home & then came on most violently.

11 July

Went round by Matlocks to the shore & were caught again by the rain but did not get much wet — staid out 2 hours, and in the evening ventured on another long walk & came home rather tired. Dr D will not give up as long as we can walk & says he is not tired at all.

Everyone of his friends think him looking very much better than last year, but I think his memory much worse.

12 July

This morning 5 of us went to Chapel & the Doctor engaged himself to dine in town to-morrow. Soon after we returned it began to rain & we did not go out again.

13 July

As Dr D had fixed the evening before, that Bessy & I should accompany him to Lancaster if the weather proved fine we set off by the boat & found there in Dr Holme who was returning from the funeral of his uncle. Mr Dockray met us & took us to Miss Robinsons — who is a charming woman.

The doctor & she talked of his old friends the Jephsons²⁰ & he seemed very much delighted, indeed he always seems to remember Nancy²¹ with great affection. When we returned we found Mr Alexander at our lodgings to tea & after tea walked



The Salutation Inn, Ambleside c. 1821

round by Slyne, then to Hest Bank, home. We enjoyed the walk very much as it was the finest sunset we had had.

14 July

Went down to the shore & staid 2 hours, gathered plants, none of which I suspect will live in our garden but it served very well for an amusement for an idle hour.

Mr & Mrs Kidding were determined to load us with plants on our return.

15 July

Left Bolton at 9, when we arrived at Preston we dined at the refreshment rooms & then went to Mr Benson's where the doctor was much pleased to find both his cousins. We had some strawberries and cream & Mrs Benson accompanied us to the rail road – she is a very nice woman.

We arrived safe in Manchester at 6 & separating went to our own homes.

The Dr told Dr Holme in the boat that he thought of selling his estate at Eaglesfield as his tenant was dead.

Following in Dalton's Footsteps: The Journey By Rail And Canal

Dalton and party would have been amongst the earliest passengers on the North Union Railway, which had connected Manchester to Lancaster via Preston just earlier that year and they probably boarded the 11.15 a.m. train from the Liverpool Road station. This was a first-class only train and the fare to Preston would have been 7/6d.²² Since Dalton's party had stopped in Preston for a few hours, their next possible train bound for Lancaster would have been the 4.50 p.m. of the Lancaster & Preston Junction Railways – they took the Swift Boat *Water Witch* instead and went along the Lancaster canal, which passed through some picturesque countryside - running only a few hundred yards from the sea at Hest Bank - it took them right into Bolton-le-Sands. Here the Packet Boat Inn was one of the stopping points for passing boats.

The Lancaster canal by this time was a well-used waterway and Dalton would have been quite familiar with it. The canal was surveyed by John Rennie in the 1770s but construction work had only begun, on both the north and south side of the Ribble,

in 1792; five years later the Preston to Tewitfield section was officially opened. The Canal Company, however, was dogged by financial problems and by the beginning of the nineteenth century the southern section was completed only from Walton Summit, five miles south of Preston, to Wigan and the two sections were linked by a temporary tramway. Construction on the northern reaches from Tewitfield to Kendal had begun in 1812 and the first boat reached Kendal in 1819. By 1826, the canal was linked to the Irish Sea by the Glasson branch. The northern and southern sections were never linked by water and the tramway became permanent.

The thirty-six mile lockfree journey up the canal from Preston to Bolton-le-Sands would have presented Dalton's travelling party with some striking engineering and architectural features on the canal and a hub of industrial activity along side it. There were lime kilns and water mills by the canal – vestiges of which can still be seen - as can the few remaining majestic larch trees from the woods, that were planted specially for canal related timber works. In its heyday the canal carried up to 460,000 tons of freight a year. The exchange trade at Galgate of limestone from the north and coal from Preston led to the navigation becoming known as the 'Black & White Canal.'²³

Rennie's mastery is evident everywhere; he built several standard bridges, including a skewed one and one with winding courses, twenty-two aqueducts and many wooden swing bridges on the canal. Past Bridge No. 91 the canal enters the Deep Cutting, 10m deep and 2 km long made through glacial deposits, via a grand gateway at the southern end. It is now an area of quiet wooded landscape but in Dalton's day it would have been busy with barges and fast boats. Many other relics of the past still visible along the canal include: the packet-boat house and adjoining wharf used for repairing passenger boats; Bridge No. 98, one of the few turnover bridges on the canal, which allowed the horses towing the barge to change sides of the canal without unhitching; canal stables, now a pub, the *Waterwitch*; mills and warehouses, which are now put to new use as homes and offices. An outstanding architectural achievement on the canal, though not as well known as Brindley's at Barton, is Rennie's aqueduct built in 1797 to carry the Lancaster Canal 664 ft across the River Lune at a height of 61 ft. Constructed from local stone, it



Market People crossing Lancaster Sands (1839) by David Cox

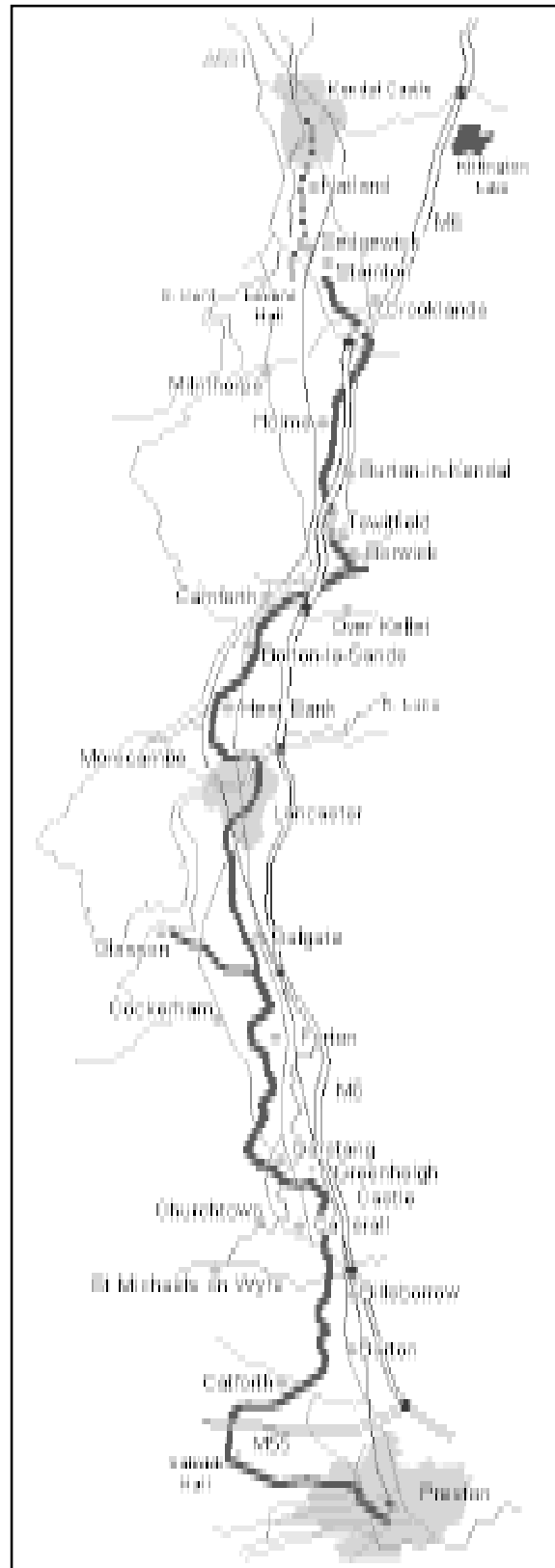
still stands on the wooden piles, driven 20 ft under the river bed, to be marvelled at as one of the most beautiful aqueducts in the country. The historic city of Lancaster with its thirteenth century Castle and Priory on the hill is visible from the canal, which traverses north through some pleasant countryside and runs only a few hundred yards away from Morecambe Bay at Hest Bank. This would have been busy with canal boats and inland vessels at one time. The Hest Bank Hotel lay on the coaching route to Grange-over-Sands on the opposite side of the bay. A light in the window facing the canal would guide the coachman across the dangerous sands. These scenes were captured memorably by many artists, including William Turner and David Cox.

When Dalton's party made their journey to and from Kendal they would have been taken at Tewitfield through eight locks in three quarters of a mile to give a rise of 76 ft. They were the only locks on the fifty-seven miles of the main line of the canal. Here the passengers had the choice of staying aboard or walking on to the final lock, a walk of some twenty minutes - Dalton preferred to walk - as Catherine informs us. They would also have gone through the Hincaster Tunnel - the only one on the canal, built to take barges close to Sedgewick Gunpowder works - here the horses would have been detached and led over the hilltop to rejoin the packet, which was probably winched through by some sort of horse gin or stationary steam engine.

Sections of the canal north of Tewitfield are now isolated and un-navigable due to the extension of the M6 northwards and are referred to as the Northern Reaches. In Dalton's day the canal journey through this region into Kendal would have been truly rewarding, with views of the fells, particularly Farlton Fell, which makes an impressive backdrop to the canal north of Holme. The main water supply of 17 million gallons a day also enters the canal in this region from the Killington reservoir. Close to Kendal the canal has been filled in and the terminus itself is built over making a sorry end to what was once a vibrant and essential part of many lives, including Dalton's.²⁴

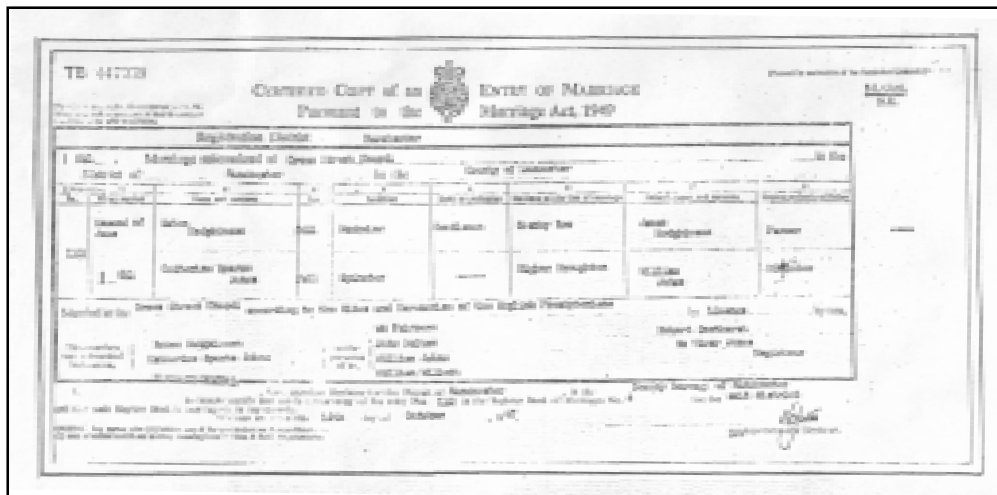
Dalton had spent his formative years in Kendal. He had arrived there as a callow youth of fifteen to help his brother run the Quaker School at Stramongate and he acquired enough polish and education in the next twelve years to be offered the teaching post in Manchester. His friendship with the blind natural philosopher, John Gough, a fellow Quaker and the subject of Wordsworth's *Excursion*, had been of profound importance to him. Kendal had an old established Quaker community with several families interlocked through marriages and business. They supported many industrial projects, including the Kendal canal - banking was dominated by the Crewdson, Wilson and Wakefield families - W. D. Crewdson was the Chairman of the canal company at the time Dalton undertook this journey. Dalton was a familiar and respected figure in this network of connections. The meeting house was built soon after the Declaration of Indulgence by James II in 1687 and for most of the eighteenth century the annual meeting of Friends from all over the north of England was held at Kendal.²⁵ Dalton frequently combined his visits to the Lakes with attendance at a meeting.

The Lancaster Packets were another notable achievement of the canal. With the Lake District becoming fashionable the packet



Current map of the Lancaster Canal - Dalton and party travelled on it in 1840

boats were aimed at the expanding tourist market. The canoe-shaped 'swift boats,' 70 ft long and 6 ft wide with a thin iron hull, were pulled by two horses at the canter. To save weight, covered cabin and steerage accommodation was provided by stretching oiled cloth over curved ribs, with spaces left for windows. (A replica can be seen at the Maritime Museum in Lancaster.)



Marriage certificate, Catherine Johns. Dalton was a witness to the marriage of Catherine Johns with Eaton Hodgkinson

The two-horsed boat service had begun as early as 1804 carrying fifty passengers. The new swift boat *Water Witch* was launched in March 1833 to provide a regular passenger service between Preston and Kendal and reportedly carried 16,000 passengers in the first six months of operation.²⁶

Business prospered and two swift boats *Swiftsure* and *Swallow* were added to the service. Refreshments were now provided and in cold weather the cabin was heated. In winter an ice-boat pulled by eleven horses kept the canal from freezing. Eleven stables were built at horse changing points, as well as boat-houses at Kendal, Lancaster and Preston and a passenger shed at Preston. Whereas the old packet boats had taken ten hours for the through journey, the new ones did it in eight, including stops and changing horses. The packet-boats ran to a strict timetable, as the mail-coaches did and a similar sort of romance became associated with them as with the best of the named road coaches. Their turn-out was immaculate, with gleaming paintwork and scrubbed decks. Only the best horses had the stamina to pull the boats at speed for a four or five mile stage. The postillion, usually a young boy with ability to duck under low bridges, brightly and elaborately dressed, rode the trace horse driving the leader; both horses had to be 15.2 to 16 hands high to keep the traces and towrope at the correct height. The “restive horse, which broke over the hedge,” described by Catherine, makes their journey fairly unusual. The ‘master’ or ‘conductor’ steered the packet from an open cockpit in the stern and communicated with the postillion by means of whistle and horn. When these so-called, ‘Superior Conveyances’ (where even second -class passengers were under cover, warm and comfortable) sped past, they were given precedence. By the time Dalton’s holiday party journeyed along the Lancaster Canal, a twice daily boat service was operating between Kendal and Preston, with a third boat between Lancaster and Preston. No wonder, Dalton could afford to dally at Preston to visit his relative.

When the railway reached Lancaster in 1840, the canal company lost no Kendal trade despite a cut-rate combined rail and coach fare of 4 shillings. If anything, the approach of the railways led to a temporary increase in business; a fourth swift boat, the *Crewdson*, was introduced to connect with the North Union train at Preston and the company halved its prices on the packets

between Preston and Lancaster. In fact, the Railway began with a number of mishaps, like the de-railment mentioned by Catherine, and such was the relative success of the canal company that in 1842 it took over the railway. However, when the railway reached Kendal on 21 September 1846, the passenger packets ceased plying.

The decline of the canals as carriers of freight was a longer process; the last traffic on the Lancaster Canal was a consignment of coal from Barrow in 1944. Since the 1970s, there has been a revival of the waterways for leisure cruising and many have been restored for navigation. We now admire the feats of civil engineering and the beauty of the associated structures, yet Catherine did not comment upon them at all - to her they were, perhaps, as much a routine of travel as fast motorways are to us now – and no more would we give room to the latter in our prized journals, particularly, if like her, there was somebody more fascinating such as Dalton to observe.

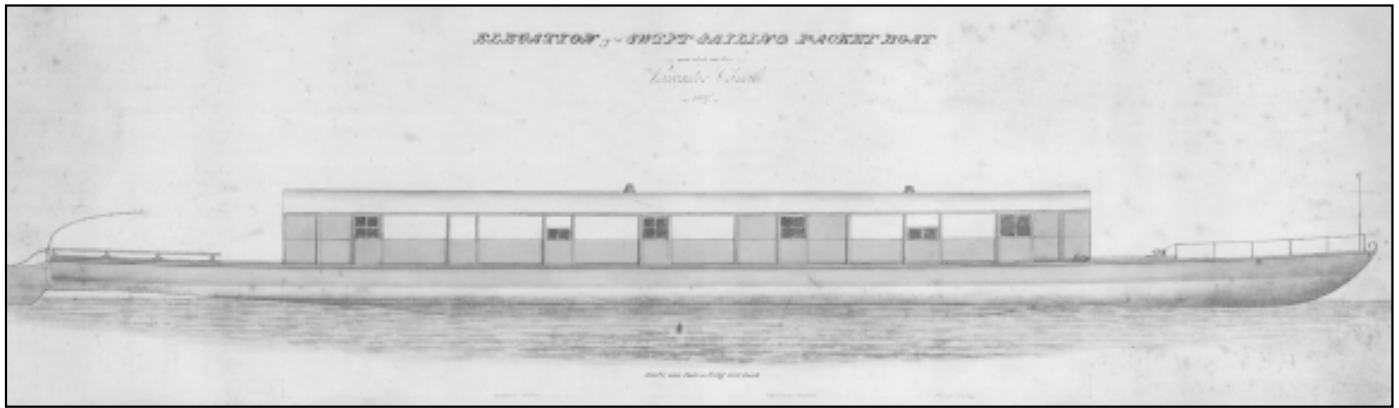
Postscript

Dalton had to go to the Lake District again a few weeks later, as he told Michael Faraday on 3 Sept 1840:

*I have been from home more than a week in Cumberland, having Peter Clare with me and my servant man, partly on business and partly on pleasure and on account of my health.*²⁷

Peter Clare was Dalton’s steadfast companion in later years and one of his executors. This visit probably was in connection with the sale of his estate, as indicated by Catherine.

Catherine’s journal is almost exclusively focused on Dalton. It is probable that by 1840, Dalton had realised that in the event of his death, Charles Henry, whom he had named as his literary executor three years earlier, might not come up with a suitable memoir. Charles Henry was by now living near Ledbury, with no intention of returning to Manchester. Dalton may then have pinned his hopes on Catherine to act a recorder of his life and work. Dalton had already written a short autobiographical note for her.²⁸ Catherine also mentions in her journal of 1840:



The Lancaster Canal Swift Boat: 'Superior Conveyance'

mother & I went to drink tea with him. We called at his room & as soon as he saw me he turned round to the fire to have a little chat. He had been making some notes of his life which he was very anxious to show me.²⁹

If Dalton felt any apprehensions about Charles Henry, he was proven correct; Henry made no attempt at a biography for nearly ten years after Dalton's death, and then he had to be helped by members of the Johns family;³⁰ Catherine's journal was to prove invaluable.

On 2 June 1841 Catherine married one of Dalton's former pupils, Eaton Hodgkinson, who was an applied mathematician and an expert on the science of materials; he collaborated with William Fairbairn in the design of the Conway and Britannia tubular railway bridges. Not surprisingly, Dalton and Fairbairn were among the witnesses to the wedding. Both Eaton Hodgkinson and William Fairbairn became Presidents of the Lit. & Phil. in 1848 and 1855 respectively.

Unfortunately, Catherine suffered from poor health, which had necessitated visits to Leamington Spa in the past, and she soon seemed to be deteriorating again. Deeply concerned, her husband watched and hoped and wrote to Fairbairn on 19 March 1842, "Mrs H, is thank God, somewhat better today."³¹ But, on the 4 July 1842, Catherine died.

Catherine's death was a devastating blow for the whole family, including Dalton. His faculties deteriorated rapidly – gone was the enthusiasm for travel. As he wrote, in probably the last letter written by himself, Dalton declined an invitation to a relative in the autumn of that year: "I hope you will excuse me for travelling for once in my 76 years."³²

When the British Association for the Advancement of Science met in Manchester for the first time in 1842, Dalton was unable to preside. Standing in for him, Lord Egerton humbly pronounced that he himself, "would gladly have served as a door-keeper in any house where the father of science in Manchester was enjoying his just pre-eminence."

Financially, Dalton was by now comfortably off; his assets amounted to £8,000 and six houses. In his will, he had originally intended £2,000 for an endowment of a Professorship of Chemistry at Oxford to promote his Atomic Theory, but when William Johns suffered a severe financial loss, Dalton revoked it by a codicil in 1843, to settle that money immediately upon his friend.

Such generosity, and the closeness to the Johns family revealed from the diary extract of his summer holiday of 1840, show that Dalton, the most famous scientist of his age, was essentially a family man. This glimpse of a much less familiar Dalton is contrary to the received image of the solitary scientist interested only in his work. In fact, friendships were, perhaps, more important to Dalton than any posthumous glory.

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Canal packet boats: Time sheet, 1833

Notes

- ¹ William Charles Henry, *Life of Dalton* (Cavendish Society, 1854) (hereafter Henry, *Dalton*); will later be referred to as Charles Henry, as he described himself. Subsequent Victorian biographers followed Henry in painting an image of Dalton; A.L. Smyth, *John Dalton, A Bibliography of Works By and About Him* (Manchester Lit. & Phil., 1997), is a comprehensive source on Dalton. See also, D. Leitch and A. Williamson, *The Dalton Tradition* (John Rylands University Library of Manchester, 1991) for the restoration of the Dalton papers.
- ² Johns family papers - personal communication.
- ³ *Ibid.*
- ⁴ Archives of the Leeds Philosophical and Literary Society; MS Deposit 1975/1, Brotherton Library, Special Collections.
- ⁵ Minutes of the Manchester Gas Committee; M27/1/1 and M27/2/1; Manchester Central Library.
- ⁶ H.E. Roscoe and A. Harden, *A New View of the Origin of Dalton's Atomic Theory* (Macmillan & Co, 1896), p. 191.
- ⁷ Henry, *Dalton*, p. 174.
- ⁸ Jonathan Otley's, *Concise Description of the English Lakes and Adjacent Mountains*, first published 1823, reached its 8th edition in 1850.
- ⁹ Henry, *Dalton*, pp.146-60; Sydney Ross, 'John Dalton's Lakeland Excursions', *Notes Rec. R. Soc. Lond.* 53 (1), 79-94 (1999).
- ¹⁰ E.M. Brockbank, *John Dalton* (Manchester, 1944), p. 27. (Hereafter Brockbank, *Dalton*).
- ¹¹ Edward H. Milligan, *Quakers & Railways* (The Ebor Press, York, 1992).
- ¹² John's family papers.
- ¹³ *Ibid.*
- ¹⁴ Dalton's maternal cousin George Bewley, in whose school Dalton and his brother had taught in Kendal, had two grand-daughters, Isabella (born 1809) and Hannah (born 1811). In 1836, Isabella married Robert Benson (1807-1887) of Bushell Place, Preston, who along with his father, Robert Benson Snr (1779 – 1864), ran a grocer's business from 149 Church Street. Robert Benson Jnr was an alderman, a JP and an esteemed citizen of Preston. Isabella and Robert Benson had stayed with Dalton in Manchester on 10 Sept. 1838.
- ¹⁵ 'S' refers to Dalton's man servant and Bessy: elder sister, Elizabeth Johns.
- ¹⁶ Benjamin Dockray went to Paris with Dalton in 1822; (see account of visit in Henry, *Dalton*, p. 165). He was a well-to-do member of the Lancaster Friends; he travelled abroad to Italy and elsewhere collecting pictures and objets d'art, and wrote essays about them. These would have been his children.
- ¹⁷ Mary Taylor (1803-1895), daughter of Samuel Taylor of Hough Hall, Moston was Dalton's former pupil; she was left a legacy by Dalton in his will: "One Hundred Pounds as a testimony of the pleasure I have had in the instruction of one of such superior mental abilities."; A.L. Smyth, 'John Dalton: Letters to a pupil', *Manchester Memoirs*, vol. 129 (1989-90) p.139.
- ¹⁸ John Dalton, *Elements of English Grammar* (Manchester, 1801, Second Ed. 1803).
- ¹⁹ Dalton's nieces, Rachel and Margaret Lickbarrow, were left legacies by him. The Wilsons and Wakefields were leading Quaker banking and industrial families of Kendal.
- ²⁰ Dr Edward Holme (1770-1847) of Kendal settled in Manchester as a physician; he was secretary, vice-president and finally president, on Dalton's death, of the Lit. & Phil. President of the Portico Library for 8 years; an antiquarian with a vast collection of books in his spacious house in King Street. A bachelor; he was buried at Ardwick Cemetery near his friend Dalton. Hannah and Ann, daughters of William Jephson, a minister of the Society of Friends at Lancaster and sail cloth merchant by trade, were visited by Dalton several times from 1795 on his journeys between Manchester and Kendal. He was extremely taken by the two girls, and wrote to his brother in 1796, "I dwell with pleasure upon the character of these two amiable creatures." Of Hannah, who was a year older than himself he enthused, "I never met a character so finished," and he described Ann as "a perfect model of personal beauty," (see Henry, *Dalton*, p. 44). Hannah married George Fisher of Bristol in 1801; Dalton and Peter Clare visited her family in 1836, while attending the BAAS meeting in Bristol and "were most kindly entertained by Hannah and her two daughters" (see Brockbank, *John Dalton*, p. 27).
- ²¹ Nancy Wilson was a Quaker friend, who died young but Dalton cherished her memory. Catherine sheds a little more light on this shadowy creature in Dalton's life, who is referred to by most of his memorialists. She recorded in her journal for Jan.1830: "While Mr D was ill with a swollen face this month he took the opportunity of looking over all his packets of letters which he brought down a few at a time ... He came to some verses written to him by a young lady in whose company he spent a week at the home of a friend in Settle – he read us the verses which were very witty – they were occasioned by his having taken from her a blue bottle which he kept & said that it was still in one of his drawers & in return he sent her another. He seemed very much affected at the remembrances, said she was a beautiful girl – has got a profile of her, which he himself had taken and under which he had written some lines. She had married and died of consumption." (See also: Henry, *Dalton*, p. 213 and Brockbank, *John Dalton*, p. 29).
- ²² Bradshaw's *Railway Companion* (Manchester, 1841).
- ²³ *The Complete Guide to the Lancaster Canal* (Lancaster Canal Trust, 2002); C. Hadfield, *British Canals* (Phoenix House, London, 1959).
- ²⁴ The Northern Reaches Restoration Group is actively working towards re-opening this section of the canal.
- ²⁵ Roger Bingham, *Kendal, A Social History* (Cicerone Press, Milnthorpe, Cumbria, 1995).
- ²⁶ A. White, *Fast Packet Boats on the Lancaster Canal* (Lancaster City Museums).
- ²⁷ A. Thackray, *John Dalton* (Harvard, 1972), p. 171.
- ²⁸ Reproduced in Henry, *Dalton*, Appendix.
- ²⁹ Johns family papers.
- ³⁰ Rajkumari W. Jones, 'Dalton's Unfortunate Choice', *Notes Rec. R. Soc. Lond.* 57 (1), 15-33 (2003).
- ³¹ B. Wharburton, 'Eaton Hodgkinson, 1789-1861' (unpublished Ph.D thesis, UMIST, 1971).
- ³² Brockbank, *John Dalton*, p. 28.