Chapter 14 Sir Isaac Newton and the Langcliffe Mathematicians

Travelling

The ancient small village of Langcliffe near Settle in the Craven district of Yorkshire is graced by Langcliffe Hall, a building probably altered from an earlier one on the site by Henry Somerscales in 1602; the first Dawson to occupy the hall as a family seat was Christopher Dawson (1647- 1693). It is claimed by several authors of books on the region that his son William Dawson was a noted mathematician and scholar and a friend of Sir Isaac Newton (1642-1727), who visited Langcliffe Hall. However, the very extensive literature on Sir Isaac Newton contains no reference to any such visit or to friendliness with the Dawson family and indeed Sir Isaac had no interest in travelling far from his homes in Woolsthorpe, Lincolnshire where he was born, Cambridge where he became Lucasian Professor of Mathematics, or London where he was Warden and Master of the Mint. Travel by stagecoach started in 1658 in Yorkshire on very rough roads with risk of robbery – London to York or Wakefield took four days. He is known to have visited friends in Stoke Park, Towcester, for two weeks in 1672 and to have stayed at Oates near Harlow in Essex to philosophize with John Locke in later life, after 1693 or so, but otherwise no other trips out are recorded. So what might lie behind these intriguing comments about a visit of Newton to Langcliffe?

The visit reports

Dr T. D. Whitaker, author of *The History and Antiquities of the Deanery of Craven in the County of York*, (first edition 1805), made the cautious remark "Major (William) Dawson was a man of talents and literature, and is said to have been one of the first persons in the North of England who understood Newton's *Principia*". The same statement was made in the later editions of 1812 and 1878 with apparently no challenge to its accuracy. W. Howson in his book *An Illustrated guide to the Curiosities of Craven* (1850) comments that "Sir Isaac is said to have been an occasional visitor at Langcliffe Hall, and to have made an arbour, still existing in the garden, his favourite retreat for philosophical meditation". He admits indebtedness to Whitaker's book so this comment is not new. H. Speight in *The Craven and North-West Yorkshire Highlands* (1892) is more effusive. "He (William Dawson) was a man of high classical attainments, and, it is averred, was one of the very few persons living at that time who could comprehend Sir Isaac Newton's *Principia Philosophae*, an erudite and once much-talked-of work, which unfolds various mathematical principles of philosophy, the chief novelty or discovery being that of the principle of universal gravitation, as deduced from the motion of the moon. This important book was published in 1687. The great philosopher is said to have been an occasional visitor of Major Dawson at Langcliffe, who had an arbour purposely constructed in the garden for him, wherein he is said to have passed many hours in solitary meditation, and also not unfrequently in learned converse with his friend over a mutual pipe. Before the re-arrangement of the gardens and outbuildings there was a rookery and a small orchard at the north side of the house, where the kitchen garden now stands, and two old apple-trees yet remain. It is here where Newton's arbour stood, and the two fruit trees are credited with having sprung from cuttings derived from an old tree planted by the Major to commemorate the philosopher's great discovery of the law of gravitation,

from the well-known story of his watching an apple fall while sitting alone in his home garden at Woolsthorpe, in Lincolnshire."

Further relevant information is found in John Peile's *Biographical Register of Christ's College 1505-1905 and of the earlier foundation, God's House* (1910). "Dawson William, son of Christopher, born Langcliffe, Giggleswick School under Mr Armitstead. Admitted pensioner under Mr Lovett January 1691/2 age 15. BA 1695/6. Admitted Gray's Inn October 1693. Married Jane Pudsey. Friend of Sir Isaac Newton who visited him at Langcliffe. Perhaps he is the author of some very good hexameters describing the older village of Langcliffe which was destroyed in a Scottish raid in the time of Edward I". (Due to the calendar change, 1691/2 refers to the period 1 January to 25 March of what we would now call 1692).

In *A History of the ancient parish of Giggleswick* by T. Brayshaw and R. M. Robinson (1932) the story is modified to "(Major Dawson) was noted for his classical and scientific attainment and is said to have been one of the first in the North of England to understand Sir Isaac Newton's *Principia.* Dr Whitaker, who was born before Major Dawson died and was acquainted with the family, states that Sir Isaac Newton visited him at Langcliffe, and an old arbour in the orchard, which fell to pieces some years ago, was always pointed out as the philosopher's favourite resort for study or writing during his stay".

Finally an article in the Yorkshire Evening News of 27th August 1948 by 'Ben Rhydding' claims that "Newton is said to have spent many hours there smoking and conversing with his host as well as in solitary meditation."

All this information is seen to be based solely on Whitaker's statement, elaborated by Howson. Whitaker was born in 1759 and Major William Dawson was born in 1676 and died in 1762. The story was therefore told to Dr Whitaker by later family members, maybe by William's son Ambrose, (who joined Cambridge a few years after Newton when Newton was Lucasian Professor of Mathematics), and so may have become distorted or misunderstood and embellished. If Isaac Newton did visit Langcliffe, as a dinner, bed and breakfast guest he may have left something to be desired. There is no evidence that he ever washed or bathed (public bathing in pools or the river was forbidden by the Vice-Chancellor of Cambridge and punished by public whipping). His eating habits were careless, he forgot to eat or sleep when in a brown study, his dress slovenly – shoes down at heel, stockings untied, his head scarcely combed (the typical undergraduate one supposes). What lies behind this legend is however illuminating if the wider context of Newton's world and that of the villagers of Langcliffe and the parish of Giggleswick in which it used to lie is considered. The story becomes a remarkable one with a theme of mathematics and natural philosophy – which in Newton's time was essentially the unfolding of our understanding of forces which hold the universe together and motion of heavenly and other bodies, described mathematically.

Mathematics
In the second half of the 17th C. there was an intense appreciation of mathematics throughout Europe, especially England. DeMoivre, Leibniz, l'Hôpital, McClaurin and Taylor are well-known mathematicians of this time who contributed, amongst others, to modern mathematical techniques still in use. Yet other

philosophers and mathematicians concerned with understanding natural phenomena such as Bernoulli, Biot, Fermat, Flamsteed, Hooke, Huyghens, Halley, Mohr, Pascal and Wallis were prominent men. Newton overshadowed most of these with his insistence on rigorous experimental observations to support scientific theories. The educated men of Langcliffe must have been aware of this intellectual ferment in the land.

Student days

Newton was born in 1642, a time of civil war, and was admitted to Trinity College, Cambridge, in 1661 at the age of 18 (older than the usual 15 or 16). He was resident there in various capacities until 1696. He did not make friends easily, being of a studious, silent, sober nature, absent-minded and paranoid at times, but he did evidently enjoy drinking and buying clothes. From a meagre student allowance from his grudging mother of £10 a year, he spent £10 on acquaintances at taverns, 17 shillings and sixpence to celebrate his BA in 1665, and lost 15 shillings at cards. "He conversed chearfully with his friends assumed nothing and put himself upon a level with all mankind". Many students from Giggleswick School went to Christ's College or were in residence at about the same time as Newton: Roger Altham, Hugh Armitstead (BA 1672/3), Robert Armitstead (BA 1662/3), Robert Banks (BA 1670/1, MA 1675), Henry Bradley (BA 1670/1), John Carr (born Langcliffe 1630?, died 1675, son of William, MB, MD, Fellow 1662-5, FRCP 1669/70, Regius Professor of Physic), John Carr (born Langcliffe, son of William, BA 1664/5), Richard Carr (BA 1667, MA 1671), Thomas Catterall (BA 1666), Oliver Craven (BA 1665/6), Christopher Dawson, Thomas Gibson, Edmund Green, Thomas Paley (BA 1671/2), Ambrose Stackhouse (BA 1670/1, MA 1674), and Richard Tennant (ordained at York, 1664). Christopher Dawson, born in Langcliffe in 1647, went to Giggleswick School and was admitted to Christ's College as a pensioner under Mr Stanford in 1663, (in common with many other students he did not graduate), and should therefore have been aware of Newton's presence and could have made friends with him. Christopher's son William also went to Christ's College, in 1691/2, and became BA in 1695/6. During this time in Cambridge William could well have made friends with the much older man Newton, now highly respected for his work, perhaps recalling acquaintanceship with his father Christopher in earlier times. William was admitted to Gray's Inn in October 1693; he probably lodged at the Inn as required for his studies but some students are known to have been allowed to lodge nearby outside the Inn. William was not called to the Bar so it is not known how long he might have resided in London. Newton often travelled to London around this time and is known to have had a circle of young friends in London so William may well have been welcomed – particularly if he did have exceptional mathematical ability and understanding to discuss weighty mathematical, theological and philosophical problems with Newton and others in the coffee houses of the day. Since 1690 as a Member of Parliament Newton "found new acquaintances under whose encouragement his accustomed reserve began to melt". Newton moved from Cambridge to London as Warden of the Mint early in 1696. It is known that in the period around 1706 in London Newton would wait for Abraham DeMoivre in a coffee house to discuss mathematics; DeMoivre was one of the young men in London, disciples really, with whom Newton found companionship possible in a way it had never been in Cambridge.

Other connections

After 1687 and the formal publication of the *Philosophiae Naturalis Principia Mathematica* (Samuel Pepys as President of the Royal Society signed the imprimatur in 1686) Newton became the most famous intellectual in England and became increasingly known to the wider world after he left Cambridge in 1696 and it is not surprising that many of his acquaintances would have told their friends and offspring about such a great man. Among the stories may have been that about the apple: the story unfortunately is not well-founded and Newton's predilection for sitting in orchards is probably more apparent than real, yet Langcliffe Hall orchard appears in the tale!

In the search for other possible reasons for a visit of Newton to Langcliffe one finds a reference to Newton's friendship with Samuel Pepys in later years in London. Pepys had a brother John admitted to Christ's College, Cambridge in 1660 who took his BA while Newton was there, and later a nephew (admitted 1695) and a cousin, Roger Pepys, who married Anne Bankes of Giggleswick in 1640. A little further afield, in Bradford, Abraham Sharp (1653-1742) had his home in Little Horton (Horton Hall in which he was born and returned to in 1694 was demolished some years ago). Abraham Sharp was assistant, astronomical instrument maker and confidant to John Flamsteed the Astronomer Royal at Greenwich and was a very able mathematician. His mural tablet in Bradford Cathedral says (in Latin) "He was rightly counted among the most accomplished mathematicians of his day. He enjoyed constant friendship with the very famous men of the same repute, notably Flamsteed and the illustrious Newton. He drew up the description of the heavens made by the former of these (Flamsteed) in (astronomical) tables of the greatest accuracy; he also published anonymously various writings and descriptions of instruments perfected by himself.. …..". Sharp's papers were lost by fire so little is known of his mathematical work. While Sharp was working in London (1684-90) he became the friend of a group of mathematical practitioners frequenting the coffee houses. Sharp was unmarried, was unmindful of his meals, led a reclusive existence later in life – rather like Sir Isaac in his early days - and is said by Cudworth (1886) to know a Mr Dawson (however, probably one of a Dawson family living in Bradford, not Langcliffe). Relationships (after 1694) between Newton and Flamsteed were rather acid and there is unfortunately no reason to suppose that Newton would have troubled to visit Sharp in Bradford on the way to Langcliffe on the stage coach. Were there perhaps other first class mathematicians Newton would have liked to confer with in and around Langcliffe to make a short visit worthwhile and relaxing after a period of intense work in the university or in the Mint? Newton certainly absented himself from Cambridge many times for a week or two, sometimes his whereabouts unknown.

Surprisingly the Parish of Giggleswick produced a number of mathematicians of notable ability during Newton's lifetime (1642-1727) and after. Giggleswick Parish Church of St Akelda contains a plaque (in Latin) commemorating "Thomas Swainson, son of Laurence Swainson of Langcliffe, and who 'knew arithmetic, geometry and astronomy perfectly' died 1733 aged 70." (So born 1664, baptised 1672(?)). A Thomas Swainson was a Governor of Giggleswick School in 1721 and 1730 but there is no record of his attendance at Giggleswick School as a pupil or at University. Thomas's father was a haberdashery merchant in London and paid tax for five hearths in Langcliffe in 1672, so was wealthy. No more is known of Thomas in the mathematical archives but being 22 years younger than Newton he must have known of his work. Thomas was contemporaneous with and 11 years older than William

Dawson (1676-1762) of Langcliffe Hall and on a social par so could be expected to have discussed the mathematics of the day together. Thomas and William are mentioned in Parish Memoranda of 1723 so they certainly knew each other.

The district of Craven is notable in England for a number of families who have been resident in this small area for many centuries – Armitsteads, Brayshaws, Brownes, Carrs, Catteralls, Claphams, Dawsons, Fosters, Ivesons, Kings, Kydds, Lawsons, Nowells, Paleys, Procters, Stackhouse, Swainsons, Tennants and a few others. Many of these families intermarried extensively; many of the children went to Giggleswick School and were fortunate in having a scholarship available, set up in 1616 by Richard Carr, to go to Christ's College, Cambridge. Peile's record of the very many admittances to Christ's College shows how nationally important a school Giggleswick was at this time. Giggleswick was one of about 40 schools in England sending pupils to Oxford and Cambridge Universities around 1700. Schooling at a good local grammar school cost only about 1% of the income of a squire or gentleman but nearer 10% for a farmer. At this time Giggleswick School was purely a classical school so mathematics was not taught.

In Langcliffe village there are three houses next door to each other – The Old Vicarage (modified c. 1676) (at the time a farmhouse belonging to the Paley family), a house belonging to the Lawsons (1681, built by Richard and Mary Lawson), and the Manor Farm House built by Leonard and Isabel Carr in 1678. The nearby Swainson house built in 1660 by Lawrence and Margaret Swainson (parents of Thomas the 'perfect mathematician') was unfortunately pulled down in about 1860 (the 'Naked woman' datestone remains displayed). Brayshaw and Robinson tell the story that William Paley (born in Langcliffe) as a boy attending Giggleswick school was neighbour to young Alice Lawson in the house next door. These two went their separate ways in marriage, Alice becoming a Starkie, and both had sons. In 1763 William Paley's son William became Senior Wrangler in Cambridge, the topmost student in the first class of the final mathematics examinations. In 1771 Alice Starkie's son Thomas astonishingly became Senior Wrangler also. But Alice went further. In 1803 her grandson Thomas reached the same pinnacle of achievement. Apparently this 'record' has not been broken. The Starkie family eventually inherited the Lawson property and it passed by marriage to the Prestons of Mearbeck, yet another family with deep roots locally. The Carrs of Langcliffe in the Manor Farm House may have been wealthy but showed no signs of academic achievement (although Leonard did possess a "reading desk and books in his Closset" as noted in his will) and in the1740s the house passed out of the Carr family. Dissenters were excluded from schools and universities until the early 1700s but it is not clear that the Carrs were Dissenters. A distant relative John Carr (of the Stackhouse side of the family) baptised 1785, died 1833, did however, become a second Wrangler at Trinity College Cambridge in 1807 and became Professor of Mathematics in Durham University.

The intriguing possibility that Sir Isaac Newton came to Langcliffe and passed the time of day with villagers, mathemically-minded or otherwise, during a stay at the Hall is hard to let go of, but there is no evidence from letters to or from Newton in the large quantity of correspondence extant that supports the legend. Nevertheless Langcliffe's claim to be a hotbed of mathematics is a strong one! And

my guess is that the apple trees in the Langcliffe Hall garden did come from Newton's garden.

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