

legs, and colicky pains in the stomach. He also complained of confusion of thought. He said that he had tried tincture of aconite according to Dr Fleming's recommended dosage, and had developed vomiting and diarrhoea for which he had taken a single dose of opium. He expressed his conviction that he should die, and that the medicine was too powerful for him. Mr Russell prescribed mild aperients, with camphor and ammonia, and did his best to cheer the patient up. That evening Russell saw his friend again in consultation with Dr Male's son-in-law, Mr Samuel Amphlett, an honorary surgeon at the General Hospital, when there appeared to be some improvement, but on the next day, Friday, when seen again by Russell, Amphlett and James Johnstone, physician to the General Hospital, he was much worse and by evening was moribund. He had no paralysis, and though in a torpid state could easily be roused, and then his intellect was clear. He was perfectly composed, and died peacefully, at about ten o'clock on Saturday morning, 26 July 1845, surrounded by his family and after taking affectionate leave of them and Mr Russell, whom he reminded of their thirty-five years' uninterrupted friendship. Twenty hours after his death Mr Russell carried out an autopsy in the presence of four other doctors, and found nothing remarkable beyond an unusual fluidity of the blood.

The inquest was held on the following Tuesday at the Grand Turk Public House before the Coroner for Birmingham, Dr John Birt Davies, who was also the first professor of forensic medicine at the Birmingham School of Medicine. Mr Russell attributed death to the accumulated doses of the aconite depressing the nervous system. Aconite was little used in treatment and he was not prepared to say that ten minims of the tincture would produce a fatal effect. The jury accordingly brought in a verdict of accidental death from an overdose of aconite, taken medicinally by the deceased.

He was buried on the following Friday in the family vault in the churchyard of St Philip's, now Birmingham Cathedral, when upwards of forty of the leading medical men of the town were said to be present.

Thus died the Father of English Medical Jurisprudence. In his book, Male refers to the poisonous properties of aconite:

Wolfsbane or Monkshood – the leaves and root of this plant are violently poisonous when fresh, but not so much when dried. They produce heat in the mouth, throat, and tongue, which gradually affects the whole body, occasioning spasm of the muscles, great debility, and giddiness; sometimes purging and vomiting, followed by delirium and insensibility.

He adds as a footnote a comment from Theophrastus that a poison

may be prepared from this drug so as to occasion death within a certain period, as two, three, or six months, for which no remedy has been discovered, on which account the people were forbidden to have the plant in their possession, under pain of capital punishment.

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## Samuel Dale (1659-1739), Physician and Geologist

by A D Morris MD  
 (Eastbourne, Sussex)<sup>1</sup>

Samuel Dale lived during the latter half of the seventeenth and the early part of the eighteenth century and was an apothecary. He practised as a family doctor in the Essex town of Braintree for over half a century.

Samuel's father, North Dale, was a silk throwster or weaver who lived in the Spitalfields district of the parish of St Mary's, Whitechapel, which at that time boasted a flourishing silk industry founded by the Huguenots who had fled to this country before and following the revocation of the Edict of Nantes. North Dale had two sons, Samuel and Francis; the latter had two sons, Francis and Thomas, and probably a third, John (*see* Table 1). Samuel and his brother were apothecaries and so also was Francis' son, Francis, who assisted his father in his medical practice at Hoxton and later succeeded him. He was a keen botanist and before settling down he travelled widely in the West Indies in search of botanical specimens, sending home 'new seeds and plants, both dried and growing' to his uncle Samuel.

Thomas Dale, Samuel's other apothecary nephew, born in Hoxton in 1699, aspired to become a physician and for this purpose he entered the University of Leiden, the Mecca of medical learning for dissenters precluded from Oxford and Cambridge. After five years he graduated Doctor in Medicine with a thesis on the medicinal plant 'Pareira Brava'. Dr Thomas Dale later had a successful medical practice at Union

<sup>1</sup>Requests for reprints may be sent to:  
 22 Vicarage Road, Eastbourne

Court, Broad Street. He had mastered classical Latin and became well known as a translator of scientific and medical books into English, the best known of his translations being of Dr John Freind's 'Emmenologia' (1729). In 1729 he emigrated to the British colony of South Carolina, having estranged his relatives by marrying a lady of whom they disapproved. He was married four times, and his fourth wife gave birth to a son, Thomas Simons Dale, in 1749; after her death in 1750 the boy was sent to live with his grandfather Francis Dale, the apothecary, in Hoxton old town. He became a scholar at St Paul's school in the City, and in 1770 he matriculated at Edinburgh University, graduating Doctor of Medicine there five years later. In 1776 he received the diploma of Licentiate of the College of Physicians of London and was appointed Consulting Physician to the City Dispensary, Grocer's Hall Court, Poultry. He was one of eight founder members of the Royal Literary Fund, established for the relief of necessitous authors, and was its registrar until his death on 21 February 1816. He was buried in Bunhill Fields cemetery, the *campo santo* of the nonconformists.

To return to Samuel Dale: the year of his birth is stated by Christy (1913) as 1658 (old style) and 1659 (new style calendar), and the place is given as the parish St Mary's, Whitechapel. At the age of 15 he was apprenticed for eight years to an apothecary, Thomas Wells, and this indenture is recorded in the minutes of the Society of Apothecaries, but there is no indication of the completion of his apprenticeship. In 1680, at the age of 21, he opened an apothecary's shop in Braintree, Essex. Though two years of his bondage remained to be completed, his venture proved

successful and at Braintree he settled down permanently as a general medical practitioner.

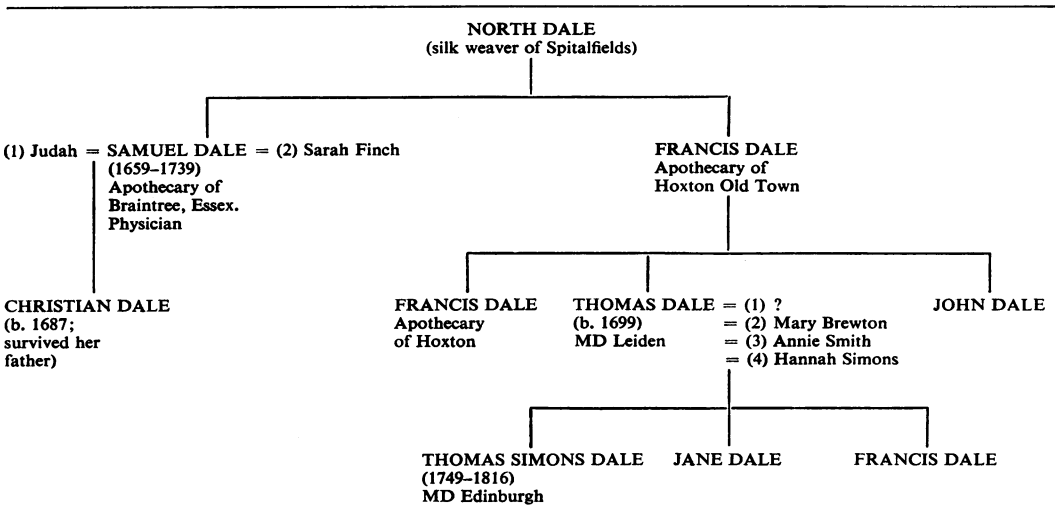
In the village of Black Notley, a mile south of Braintree, lived a Cambridge graduate, a clerk in holy orders and former fellow of Trinity College, John Ray. As a consequence of the Act of Uniformity (1662) Ray had been expelled from his collegiate fellowship, losing all his emoluments and all hope of ecclesiastical preferment, but he found a benefactor in Francis Willughby, a former student of Trinity College, by whom he was engaged as tutor and travelling companion to tour the continent to study natural history; Willughby left Ray an annuity of £70, which was said to be the 'barest minimum for the upkeep of a wife and family'. Ray never returned to collegiate life, but retired to a cottage at Black Notley and devoted himself to a study of the natural sciences. Samuel Dale first met Ray when he was called in to give medical treatment to the family, and in time they became intimate friends. Dale speedily adopted Ray's enthusiasms, and assisted him in his botanical work.

Over the years Dale contributed nine papers to the *Philosophical Transactions* of the Royal Society. The most important were one describing the strata and fossils of Harwich cliff, and a short clinical report concerning a woman, Grace Dennis of Braxted Magna, 'who suffered under an obstinate jaundice, accompanied with that defect of sight which pathologists have called Amblyopia Crepuscularis, in which vision is quite lost at sunset'.

Dale published two books of outstanding merit. The first, which appeared when he was 34, was entitled 'Pharmacologia' (Fig 1), was dedicated to the College of Physicians of London and bore

Table 1

The Dale family tree



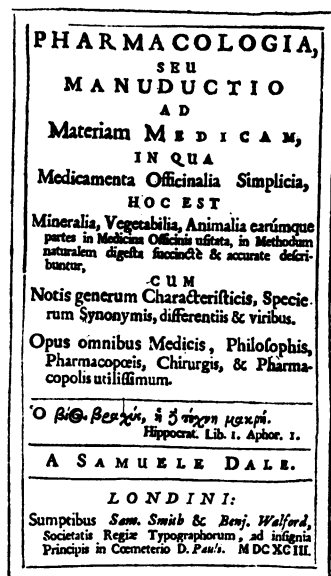


Fig 1 Frontispiece of Dale's 'Pharmacologia'

(Figs 1 &amp; 2 by courtesy of the Wellcome Historical Medical Museum)

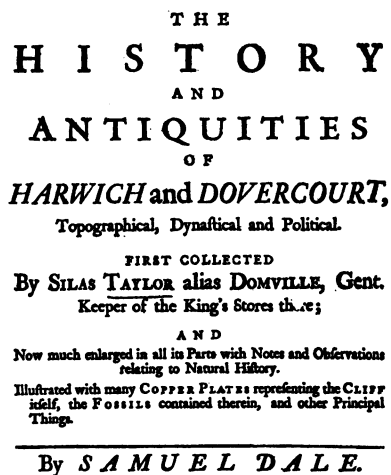
the College *imprimatur*. In the third edition, much amended and enlarged, of 1737, the author's name, in a latinized form, is followed by the letters ML, indicating that Dale had a licence to practise physic and could call himself a physician. His name does not appear in the records of the Royal College of Physicians, but can be found in a list of medical practitioners licenced under the Act 3 Henry VIII c.2. 'Pharmacologia' was virtually a combined textbook of materia medica, pharmacology and therapeutics, written in Latin, and was said to be favourably received by the medical profession and in steady demand for the next fifty years. Each new edition was considerably amended and enlarged by the author.

Dr Charles Lucas, in the preface to his book 'Pharmacomastic' (1741), writes:

I have reserved to bring up the rear, the brightest ornament of his profession, the late lamented Mr. Samuel Dale, whose excellent Pharmacologia has rendered him so well known to the illustrious College of Physicians in London, that before he published the last edition of his works, which he greatly augmented and improved, he was honoured with a licence to practice physic.

Dr Richard Pulteney said that the classification and description of the plants in 'Pharmacologia' was taken from Ray's 'Methodus Plantarum' (1703), and that the materia medica in the first edition was one of the earliest rational books on the subject.

The second of Dale's notable works was published in 1730 and the title page (Fig 2) reads:



LONDON:  
Printed for C. DAVIS in *Pater-noster Row*, and T. GREEN  
over against the *Mint* at *Charing-Cross*.  
MDCCCXXX.

Fig 2 Frontispiece of Dale's history of Harwich

The History and Antiquities of Harwich and Dovercourt, Topographical, Dynastical and Political. First collected by Silas Taylor alias Domville, Gent. Keeper of the King's Stores there; and now much enlarged in all its Parts with Notes and Observations relating to Natural History. Illustrated with many Copper Plates representing the Cliff itself, the Fossils contained therein, and other Principal Things. By Samuel Dale. London 1730

The only difference in the second edition, which appeared in 1732, was in the wording on the title page: the author's name was given as Samuel Dale, author of 'Pharmacologia', and the book was dedicated to Sir Hans Sloane Bt, President of the College of Physicians, 'in grateful acknowledgement of his many favours'. The appendix contains an account of the various strata which make up the Harwich cliff (Fig 3), with a classification and description of the species of embedded fossils. Dale discusses the problem which had puzzled oryctologists for centuries: how did the fossils originate? Were the figured stones *lapides sui generis*, that is natural stones like minerals, or were they fossilized remains of parts of animals or plants? Dr Martin Lister and Dr Robert Plot, leading palæontologists of the time, upheld the opinion that they were *lapides sui generis*, produced by some plastic power inherent in the crust of the earth, but Robert Hooke MD believed that they owed their form and figuration to the shells of certain shellfish.

The Harwich cliff consisted mainly of a stratum of bluish clay, now called London clay, and was

overtopped with a reddish stratum of sand, gravel, pebbles and fossil shells known as the 'crag', a Suffolk term for gravel. At the base of the cliff fossils were washed out of the crag by the tides and were easily collected on the beach. Samuel Dale was gratified that he was the first to describe the strata and fossils of Harwich cliff, 'the first invention of which', he said, 'the late Dr Woodward, in public company, attributed to me'. His account of the Harwich fossils appears in the appendix to his book, copied from a paper published in *Philosophical Transactions* thirty years earlier, but now illustrated with two copper plates representing the cliff and four plates figuring nearly all the fossils described.

In the preface Dale stated that the foundations of the book were laid by Silas Taylor about the year 1676. Captain Taylor, who had been an officer in the Roundhead army during the civil war, died at Harwich in 1678, and his manuscript passed to Dale who began to edit it with a view to publication. The text comprises 255 quarto pages and was compiled directly from Taylor's manuscript, but the appendix was entirely the work of Dale and contains his account of the geology of Harwich cliff. He describes the cliff as 'a sort of promontory, which divides Orwell Haven from the *aestuarium* contained between that and Walton Naze or Ness'. Some 43 fossils from the Harwich cliff, the Red Crag fossils of the present day, were described by Dale, and to these Challinor (1954) has applied the modern classification and terminology, remarking that Dale's 'long appendix and notes made this, for the period, a notable scientific work'.

At the time of publication of 'Pharmacologia' in 1693, Dale was concerned about the health of

his friend and patient Ray, who was then 66. By 1704 it seemed doubtful whether Ray could survive another winter, and he died on 17 January 1705, in his 78th year. He was considered 'one of the greatest botanists in history, who gave the world the first systematic account of the British Flora, and contributed richly to the advancement of geology'. The third and last volume of Ray's 'History of Plants' appeared in 1704, and in the preface he thanked 'Samuel Dale, doctor and physician, my neighbour and friend at Braintree who checked the synonyms, corrected errors, and supplied omissions'. Dale was Ray's chief helper in the completion of this monumental work, and he had been asked to take over the completion of Ray's 'A History of Insects' which appeared posthumously in 1710, but he declined: 'the exotic part I cannot fathom, it requiring more brains and time than I can give, nor am I master of so good language as anything joyned to Mr. Ray's would observe'. Ray's book was prepared for the press by Dr Derham, a naturalist.

Dale's name is preserved by a species of fossil shellfish, *Buccinum dalei* (Dale's whelk; *Liomesus dalei*). In naming it, James Sowerby (1757–1822), himself a student of the crag fossils, said he did so 'to commemorate the labours of Dale, who appears to be the first person that took notice of the Suffolk crag fossils'. His name is also commemorated by two botanical genera, a genus of herbaceous plant named *Dalea* by Linnaeus (before 1753), and a genus of solanaceæ which Philip Miller named *Dalea* after 'Mr Dale, apothecary, of Braintree'. A mammoth species of sea mammal was long known as Dale's bottle-head, or flounder's head, whale, but is now known as Dale's bottle-nosed whale (*Hyperoodon ampul-*



Fig 3 Harwich cliff (from Dale's history of Harwich)



Fig 4 *Samuel Dale (1659–1739)*—by courtesy of the *Worshipful Society of Apothecaries of London*

*latus*). An engraving of this whale appears in 'A History of Harwich'. In 'Birds of Essex' Miller Christy (1898) says that Dale was the first to describe the wild birds of Essex.

Many writers on crag geology have mentioned Dale and quoted his contributions to the subject, and a well-known East Anglian geologist F W Harmer named Dale 'father of crag geology'.

Canon C E Raven, biographer of Ray, says that Dale was a staunch nonconformist. He founded a religious meeting house at Bocking, Essex, in 1707, used by a congregational denomination of which he had been elected deacon. Dale died in the early hours of Sunday morning, 18 March 1739, and was buried in the little graveyard attached to the chapel at Bocking. No gravestone can now be found.

Dale was twice married, and had six children by his first wife, Judah. Five children and both wives predeceased him. The sixth child, Christian, baptized on 4 November 1687, was still alive when her father made his will in August 1738. The second wife, Sarah Finch, describes herself in her will dated 1 July 1726 as 'wife of Mr Samuel Dale of Braintree, Apothecary', which seems to show that Dale had not then taken a physician's degree. Dale's own will, dated 5 August 1738, describes him simply as 'gentleman'. The will showed that he possessed substantial means, and in an important legacy to the Society of Apothecaries he

left such of his books as the Society lacked copies of, his own herbarium, and the *hortus siccus* bequeathed to him by his friend and neighbour John Ray. He remembered his nephew Francis in his will, but his other nephew, Dr Thomas Dale, was not mentioned.

An oil painting of Dale (Fig 4) was presented to the Society of Apothecaries by the widow and children of Dr Thomas Simons Dale after his death in 1816. It still hangs in the Apothecaries Hall in Blackfriars Lane.

Samuel Dale was a humble, much beloved, general medical practitioner, with a large and busy practice. His success as a GP was overshadowed by his researches in the natural sciences and pharmacology. He was described at the time as a good botanist, zoologist and oryctologist, but I believe he was above all a good, reliable family doctor.

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