John Snow: pioneer of anaesthesia and an early epidemiologist

This year marks the 200th anniversary of the birth of John Snow, who, in his short life of only 45 years, achieved fame both as an early pioneer of ether and chloroform as anaesthetic agents and of their use in obstetrics, and also for his work in demonstrating that cholera is a water-borne disease.

Snow was born in York in 1813, the eldest of nine children; his father was a farmer. In 1832, at the age of 19 years, Snow entered the newly opened Medical School in Newcastle, one of eight foundation students. In his first year there he witnessed an outbreak of cholera at a local colliery. In 1836, Snow migrated to London (travelling by foot) and continued his medical studies at the School of Anatomy in Great Windmill Street, (founded by William Hunter), and at Westminster Hospital. He obtained his Membership of the Royal College of Surgeons and Licenciate of the Society of Apothecaries in 1838 and his MD (London) by examination in 1844. He set up as a GP in Soho as well as lecturing in forensic medicine at the Aldersgate School of Medicine just before its closure.

In October 1846 the dentist William Morton had introduced the use of ether anaesthesia at the Massachusetts General hospital in Boston. News of this reached London a couple of months later and ether was used successfully by Robert Liston, at University College Hospital, in performing an above-knee amputation of the leg on 21 December. Snow took up this exciting discovery with enthusiasm and was appointed anaesthetist at St. George's Hospital in 1847, soon becoming one of the leading anaesthetists in the metropolis. That year he published one of the first monographs on the subject 'On the inhalation of the vapour of ether in surgical operations; containing a description of the various stages of etherisation and a statement of the results of nearly 80 operations in which ether has been employed in St. George's and University College Hospitals'.

He devised his own apparatus, which regulated the concentration of ether delivered to the patient via a vaporising chamber in a water bath contained in a copper box. In 1848, he modified this for use with chloroform, which became his preferred agent in adults. A series of 4000 patients were given chloroform, with one death possibly related to the anaesthetic agent.

In 1853 he was requested by Queen Victoria's physician, Sir James Clark, to administer chloroform to the Queen for the birth of her eighth child, Prince Leopold. The anaesthetic was given, drop by drop, on Snow's handkerchief. Victoria was delighted with the result and wrote: 'Dr Snow gave that blessed chloroform – soothing, quieting and delightful beyond measure.'

In 1857 Snow again anaesthetized the Queen for the birth of Princess Beatrice. These Royal occasions did much to make anaesthesia in midwifery (chloroform à la reine) morally and socially respectable.

In the middle of all this work as anaesthetist and GP, Snow became deeply interested in the cause and spread of cholera, which he had first encountered as a medical student in Newcastle. There had been deadly outbreaks of this disease in the UK in 1831, 1848–9 and 1853. The two commonly held theories of spread of the infectious diseases were by contagion (contact with an infected subject) or by miasma (spread via the stinking air of the crowded cities) (the latter warmly supported, for example, by none other than Florence Nightingale).

Towards the end of the 1848–9 epidemic, in which over 5000 victims died, Snow wrote a short monograph entitled 'On the mode of communication of cholera', in which he proposed that material from the excreta of the cholera sufferers was accidentally swallowed by healthy persons, multiplied itself within them and was then passed on in the sewers and thence into the drinking water. He pointed out that, in London, most of the deaths occurred in a district which obtained its drinking water supply from the Thames at the site where it was heavily contaminated by sewage effluent. He further suggested that water thus contaminated could be purified by filtration through sand or gravel or by allowing it to stand in reservoirs. These simple preventable measures were suggested by this GP anaesthetist more than 30 years before the discovery of the vibrio of cholera.

Towards the close of the 1854 cholera epidemic occurred the incident by which John Snow is especially remembered today. Snow carried out a meticulous house to house survey of a small area of central London, where over 500 deaths occurred in a period of 10 days. The victims had obtained their drinking water from the pump in Broad Street, Golden Square. This was a popular source of drinking water because it was particularly sweet. One victim, living several miles from the pump, especially sent for water from this source. Another interesting finding was that the workers at the local brewery seemed to be immune to the disease; enquiry revealed that none of them drunk water from the Broad Street pump – they all quenched their thirst with their ration of beer. Snow ordered the removal of the pump handle and, a few days later, new cases ceased to occur.

In 1855 Snow published a second, much enlarged, edition of his book, now grown into a substantial volume, in which he documented the source of the drinking water of every house in which a case of cholera had occurred.

Snow was chronically ill for most of his adult life; he suffered from tuberculosis and nephritis, being treated for the latter by Richard Bright, of Guy's, the great authority on the subject. Snow was a life-long teetotaller and vegetarian. He died at the early age of 45 years, following a stroke, in 1858 and is buried in Brompton Cemetery.

Although a teetotaller, Snow is commemorated by a public house, The John Snow, which stands near the site of the Broad Street pump. BJHM

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