

Medicine in Stamps

John Hunter (1728 - 1793): founder of scientific surgery

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John Hunter, the Scotsman who brought science to surgery, was the tenth child of the Laird of Long Calderwood. The senior Hunter was almost seventy years old when John was born on July 14, 1728. John Hunter is sometimes confused with his two older brothers, William and James. William was a well-known London anatomist, and James studied law and contemplated switching to medicine before succumbing to tuberculosis at the young age of 28. No serious student of medical history, however, should ever mistake John Hunter's identity or his contributions. This unruly and impudent child, who spent countless hours wandering on his father's estate, matured into one of the world's most prolific naturalists. He brought scientific experimentation and precision to the surgical bedside, and liberated the discipline from its 2,000-year barbaric past.

John Hunter hated school, and preferred instead to study the wonders of nature. His curiosity was insatiable; he asked questions such as why the leaves changed color in autumn, what clouds were made of, and how the tadpole became a frog. At 17 years of age, young John moved to London at the invitation of his older brother, William, who was ten years his senior and an established anatomist and obstetrician. John assisted William at dissections, and startled his brother by producing a flawless specimen on his first attempt. He subsequently studied under William Cheselden at the Chelsea Hospital, and later under Percival Pott at St Bartholomew's Hospital. John then enrolled at Oxford University but quickly left this revered institution after two months, saying: "Why, they tried to make an old woman of me; they

wanted to stuff me with Greek and Latin at the university, but these schemes I cracked like so many vermin as they came before me."

Appeal of Nature: John Hunter was first and foremost a naturalist. It has been said that he "worshipped Nature with profound humility. He was not just a disciple of Natural History – he was its High Priest." In his beloved dissection room, Hunter operated on simpler life forms in order to understand the complexity of the human body. To sustain his study of comparative anatomy, he contracted with zookeepers and circus owners for the carcasses of rare animal species. In 1760, he had the unexpected opportunity to study marine biology during his brief service with the Navy, and it was during his military years that he began to classify animals into some sort of phylogenetic series.

The young anatomist returned to England in 1763, along with 200 or so specimens that he had collected. In 1765, he bought a plot of land in Earl's Court to accommodate his bewildering array of animals. The whole atmosphere was very much like a research farm with anecdotal stories of leopards and jackals living alongside the sheep, goats and ostriches. It was indeed to this menagerie

that John Hunter brought his beautiful young wife, Anne Home, a talented poet well educated in literature and music.

Although Hunter never formally publicised his views on evolution, his observations were reminiscent of Charles Darwin's work in the Galapagos Islands. Hunter collected more than 14,000 animal species, and arranged his dissections into two main groups: (1) structures developed for the preservation of the individual; and (2) structures essential for ensuring the



continuity of the species. Together with an additional third group of assorted pathological specimens, this monumental collection, his greatest unwritten legacy, can now be admired at the world-renowned Hunterian Museum of the Royal College of Surgeons in Lincoln's Inn Fields, London.

Call of Experimental Surgery: England's Seven-Year War impacted Hunter, as he had to interrupt his dissections to enlist as a Navy surgeon. There, he made astute observations on important surgical phenomena such as inflammation and the factors that promote healing of wounds. This no doubt contributed to his book "*A Treatise on the Blood, Inflammation and Gunshot Wounds.*" Upon his return to civilian life, Hunter slowly built up his surgical practice. He was not particularly enamoured by routine patient care and had to supplement the small practice income with his military half-pay and by teaching anatomy. His curiosity and quest for knowledge however consumed him. He traveled extensively, and invested great amounts of time and money – and ingenuity – to amass interesting and rare specimens. An example was how he obtained the body of the Irish giant, Charles Byrne. When Byrne was dying of tuberculosis, he caught wind of Hunter's interest in obtaining and studying his body upon death. Byrne was horrified and arranged for his coffin to be sunk into the North Sea after he died. Hunter, however, managed to bribe the undertaker and in the dead of the night, exchanged the giant's remains for paving stones. Thus, a heavy coffin silently reached its watery grave, while an oversized cadaver traveled back to Earl's Court to face Hunter's scalpel.

Among Hunter's classic experiments was his demonstration of the principle of collateral circulation. He hypothesised that if a major vessel was obliterated, new smaller vessels would form proximally to re-perfuse the compromised tissues. He confirmed this hypothesis by tying a thread around the carotid artery of a young stag that he caught in London's Richmond Park. Initially, the antler on the operated side became cold and stopped growing, while the contralateral antler remained warm and healthy. However, within a fortnight, the affected antler regained its warmth and started growing once more. Using dye injections, Hunter showed that the circulation to the antler had been restored through collateral vessels. It was not long before Hunter applied this lesson to a patient. The famous Percival Pott had recommended amputating the limb of a patient with a popliteal aneurysm. Hunter instead ligated the femoral artery above the aneurysm, and awaited the growth of collateral vessels. The patient

survived the operation, made an uneventful recovery, and was able to walk out of the hospital unassisted.

Hunter was neither technically skillful nor was he an inspiring lecturer. It was his insistence on scientific rigor and scholarship that attracted many students, including Thomas Chevalier (who became Professor of Anatomy and Surgery at the Royal College of Surgeons), Edward Coleman (founder of scientific veterinary surgery in Britain), William Shippen (one of the founders of the University of Pennsylvania), and Philip Syng Physick (father of American Surgery). His most famous student was undoubtedly Edward Jenner, the man whose pox-immunisation led to the eradication of smallpox. In 1768, Hunter was elected to the Company of Surgeons of London, subsequently renamed the Royal College of Surgeons. The following year, he was appointed surgeon to St George's Hospital, and in 1776, King George III bestowed upon him the title of Surgeon Extraordinary. In 1786, he won the Copley Medal, the highest award of the Royal Society.

Wrath of Nature: Men of genius, like all mortals, have their Achilles heel. John Hunter was no exception. His was the lethal combination of quick arousal and bilious anger. At the age of 57, Hunter began to experience chest pain. These episodes became more frequent, and were brought on by stress, anger or exertion. On one occasion, the fiery Hunter remarked to a student that his "life is in the hands of any rascal who chooses to annoy me." The chest pain was not initially recognised as angina pectoris. The famous British physician, William Heberden, believed that cramping of the heart muscles caused it. Others thought that the pain was due to neuralgia. In a series of autopsies, Hunter's student and lifelong friend Jenner took his mentor's words ("Why think or speculate – why not try the experiment?") to heart, and proved the cause of angina pectoris was obstruction of the coronary arteries. On October 16, 1793, John Hunter, at the age of 65 years, became embroiled in a heated argument at a board meeting of St. George's Hospital. It was a simple matter of someone opposing his support of two Scottish students wishing training in surgery. He stormed out of the meeting room, was gripped with a vice-like pain in his chest, and then collapsed in sudden death. An autopsy revealed what Jenner had predicted – atherosclerotic occlusion of the coronary arteries.

Hunter was initially buried in an inconspicuous grave. Sixty-six years later, his remains were transferred to Westminster Abbey with a fitting epitaph, "The Royal College of Surgeons of England has placed

this tablet on the grave of Hunter to record admiration of his genius, as a gifted interpreter of the Divine power and wisdom at work in the laws of organic life, and its grateful veneration for his services to mankind as the founder of scientific surgery." In 1914, the Royal College of Surgeons of England initiated the Hunterian Oration, an annual affair that highlights the contribution of science to surgery, and honours the man who is unquestionably the world's first surgical scientist.

BIBLIOGRAPHY

1. Hanlon RC. The commemoration of surgical teachers. *Arch Surg* 1995; 130:1131-5.
2. Harrison LH Jr. John, not James Hunter. *Am J Cardiol* 1999; 83:141-2.
3. Manders EC and Manders EK. Academic surgeons take heart: the story of a student, his mentor, and the discovery of the etiology of angina pectoris. *Am Surg* 1996; 62:1076-9.
4. Maxwell B. John Hunter: the first surgical scientist. *Can J Surg* 1987; 30:68-71.
5. Nuland SB. *Doctors: The Biography of Medicine*, New York: Vintage, Reissue edition, 1988.
6. Victor R. *Pathfinders in Medicine*. New York: Medical Review of Reviews, 1912.



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