Richard Owen and Joseph Lister: giants of surgical science in the nineteenth century

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INTRODUCTION

Richard Owen and Joseph Lister were two of the major figures in the development of the surgical sciences in the nineteenth century. This article explores the connections between the two men and was inspired by a letter from Owen to Lister written in 1853. The story behind the letter involves a major advance in microscope design and the growing interest in comparative anatomy triggered by John Hunter and Charles Darwin.

RICHARD OWEN

Owen was born in Thurnham Street, Lancaster in July 1804. He became a pupil at Lancaster Grammar School at age six and, according to his sister, was 'very small and slight and exceedingly mischievous.' At age 16 he was apprenticed to Leonard Dickson, surgeon and apothecary of Lancaster. According to the terms of his indenture, Dickson was to teach him 'the arts, businesses, professions and mysteries of a surgeon apothecary and man midwife with any circumstance relating thereto.' Dickson was surgeon to the County Gaol at Lancaster Castle and was expected to perform post-mortem examinations on the prisoners. Owen soon developed an interest in anatomical dissection which never left him. Within 12 months he already had a collection of skulls of cats and dogs and skeletons of mice and small deer. The infamous 'Negro's head story', detailed previously in this journal,⁽¹⁾ occurred during this early stage of his career.

Following Dickson's death in 1822, Owen spent short periods with two of Lancaster's other surgeon-apothecaries, Joseph Seed and James Stockdale Harrison, before becoming a medical student at Edinburgh University in 1824. Disappointed by Monro's anatomy lectures at the university, Owen decided to enroll on John Barclay's lecture series on surgical anatomy. This was just four years before the Burke and Hare murders scandalised the private anatomy schools in Edinburgh.

Barclay recognised Owen's talent and advised Owen to continue his anatomical studies with John Abernethy at St Barts, in London. Owen arrived in London in 1825 with some trepidation but was soon appointed as prosector by Abernethy.

In 1800, the Company of Surgeons had been granted a Royal Charter to become the Royal College of Surgeons in London,

Richard Owen
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later of England. The government had already placed into the care of the college the writings and large specimen collection of John Hunter (1728-1793), a surgeon regarded as one of the most distinguished scientists of his day. A new college building was built at Lincoln's Inn fields in London to provide lecture theatres, meeting rooms and accommodation for the Hunterian Collection. The collection and the increasing interest in human and comparative anatomy it stimulated were important in the development of surgical science during the nineteenth century. In 1826, the collection was in a rather haphazard state and in need of extensive cataloguing. Abernethy, by then President of the Royal College of Surgeons, encouraged Owen to apply for the post of assistant conservator to the Hunterian collection.

In many ways this appointment was the major turning point in Owen's life, as it allowed him to develop his interest in comparative anatomy. Owen began the mammoth task of examining and cataloguing the 3,970 specimens in the Hunterian collection. Owen's determination to accurately describe the collection led him to a close relationship with

compromise on the restriction was agreed. Nations that had ratified the convention could begin implementation. Great Britain signed and the treaty first used the words 'Dangerous Drugs'.

1914: DORA

The Defence of the Realm Act gave the state sweeping

powers to regulate and control the lives of British citizens, and to rule by proclamation. The focus was on the moral wellbeing of the nation to aid the war effort.

1916: cocaine use by soldiers

Following the distribution of cocaine to the troops the use of cocaine appeared on the streets of London as soldiers

returned on leave. Under DORA Regulation 40b control of this substance was retained: drug distribution treated as a criminal matter and threat to national security. The Regulation extended the authority to the Home Office and police to inspect retail pharmacists' premises and records.

Panama Canal opens
1914

Battle of the Somme
1916

Russian revolution
1917

the Zoological Society and he was given unique access for dissection of any animals that died in the care of the society.

After becoming engaged, Owen flirted with a surgical career, applying for a house surgeon post at Birmingham Hospital in 1829, but he soon returned to his anatomical work. The following year, he published the first of many zoological papers – 'On the anatomy of the Orangutang'. His 'Memoir on the Pearly Nautilus' in 1832 proposed two new orders of cephalopoda and attracted much interest. In 1834, he was elected to the fellowship of the Royal Society for his work on comparative anatomy and in the same year he was appointed to the newly created chair in comparative anatomy at St Barts, where his pupils included a young James Paget and Arthur Farre. Following an autopsy observation by Paget, Owen published the first microscopical description of the entozoon parasite *Trichina Spiralis* (Trichinosis) in 1835.

In 1837, Owen succeeded Sir Charles Bell as Professor of Anatomy and Physiology at the Royal College of Surgeons. Whereas Bell had shared lecturing responsibilities with the Professor of Surgery, Owen accepted the task of delivering all 24 annual lectures on the Hunterian collection himself. He delivered these every year until 1855 without repeating a single lecture!

Alongside his ongoing work with the Hunterian collection, Owen developed an enthusiasm for microscopy, writing in 1841 whilst on holiday: 'I set off after breakfast, with a teacup in my hand, looking for objects for the microscope. Of course, a bit of seaweed gave me a world of objects, among them a minute transparent species of limpet, studded with rows of iridescent azure and green spots, no bigger than 1/8th of an inch.'

Owen first met Charles Darwin in late 1836, shortly after the latter's return from the voyage of the Beagle. Owen examined many of Darwin's specimens but was particularly interested in fragments of teeth from the extinct megatherium and other animals. Owen decided to perform a microscopical analysis of teeth from every species of animal, culminating in the first major publication on odontology in 1845 – the two-volume 'Odontography, or a Treatise on the Comparative Anatomy of the Teeth'.

THE MICROSCOPICAL SOCIETY OF LONDON

In September 1839, 17 microscopists met in Wellclose Square to 'take into consideration the propriety of forming a society for the promotion of microscopical investigation, and for the introduction and improvement of the Microscope as a scientific instrument.' Amongst the men was Arthur Farre, then Owen's lecturer in comparative anatomy at St Barts, and James Bowerbank, founder member of the Zoological Society and national authority on sponges.

Also present was Joseph Jackson Lister, a wine merchant by profession. Lister had developed an interest in lens design and,

like Galileo before him, started to make his own glass lenses to test out his theories on optical instruments. In 1830, Lister had published the landmark paper 'On the improvement of Achromatic Compound Microscopes', which described how lens systems could dramatically reduce spherical aberrations leading to major improvements in microscope design.

At the meeting in 1839, the decision was made to set up a society (later to become the Royal Microscopical Society) and a provisional committee was set up, including Bowerbank and Lister, in order to establish a constitution and officers for the new society. In their deliberations upon which prominent scientist they should ask to become the first president of the society, the committee was probably influenced by the advice of Farre and Bowerbank. Richard Owen, at the age of 36, served as the first president from 1840 to 1841, and had a large part in writing the constitution of the new society.

JOSEPH LISTER

Born in 1827, Joseph was the second son from the marriage of Joseph Jackson and Isabella Lister. Although there were no medical practitioners in the family, Joseph declared as a young child that he wanted to become a surgeon. He wrote to his father at age 14: 'When mamma was out I had nothing to do but draw skeletons so I finished the cranium and named the bones of it, and also drew and painted the bones of the front and back of the hand and named them.'

In 1844, aged 17, Lister started his studies at University College London, the initial three years studying for the general matriculation and BA degree. Lister was in the audience in

Joseph Lister, aged about 28, from a daguerreotype

1918: drug deaths

After a night of partying at a Victory Ball the English actress Billie Carleton died. Her death was attributed to cocaine. A full-blown moral panic ensued in the press about the drug culture and the young aristocrats and bohemians who participated in it.

1919: Treaty of Versailles

Article 295 incorporated the Hague Convention Treaty of 1912 and committed Versailles signatories to the implementation of 'Dangerous Drug' measures.

1920: Dangerous Drugs Act

The 1920 Act prohibited the importation and exportation of

opium, cocaine, morphine, tincture of cannabis and diamorphine save under licence. Breaches of the Act became criminal offences. The Act conferred on police officers and other authorised persons powers of inspection of the premises of producers, manufacturers, sellers and distributors of such drugs, but not of doctors' surgeries.

Letter from Owen to Lister, 1853⁽²⁾

My dear Joseph Lister
 I beg my thanks for the copy of your Memoir on the contractile tissue of the iris, and of the later one just received on the muscles of the hair follicles.
 Both memoirs are of great interest, and to me, more particularly, as indications of the future probable gain to anatomy of a careful and exact observer whose early love of that science I may have helped to foster.
 I hope you keep your health under the pressure of your studies and professional engagements.
 I can sympathise with your good father in the happiness which your professional career must have afforded him. When you see him remember me most kindly to him; and were my wife here, she, I know, would join me in good wishes to all the members of your family. I would remind them that the train from Waterloo Sta. to Mortlake would bring them within 15 minutes walk of our cottage, which is close to Richmond Park.
 When my holidays arrive, in September I will try to tempt them and you to spend a day with us: at other times save on Sunday, I have only the evenings after 6 for friends at home.
 Believe me Very truly yours
 Rich^d Owen
 Joseph Lister Esq. F.R.S.
 University College Hospital

R. Coll. of Surgeons
 Aug 2nd 1853

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1846 when Robert Liston performed the first major operation in England with ether anaesthesia (a thigh amputation). Towards the end of this three-year period he had an attack of smallpox and soon afterwards a 'nervous breakdown' which led to a prolonged break in 1848. Fortunately he was able to return to his studies and qualified with both MB degree and FRCS in 1852.

In the later months of 1852 and early 1853, he carried out some original research which was largely microscopical and anatomical in nature. These two papers (on the muscular anatomy of the iris and hair follicles) were clearly facilitated by his father's advances in microscope design and were published in the quarterly *Journal of Microscopical Science*.

LATER CAREERS

Having already decided on a surgical career, Lister was not persuaded by Owen to develop a career in anatomical research. Lister subsequently developed his surgical career in Edinburgh, with James Syme, before taking up the chair in surgery in Glasgow in 1860. Lister was the first surgeon to recognise the importance of Pasteur's work on fermentation and developed the ground-breaking system of antiseptic surgery described in the landmark *Lancet* paper of 1867, 'On a New method of treating Compound Fracture, Abscess etc, with observations on suppuration'. The importance of Lister's work for modern surgical practise cannot be overstated and his efforts were recognised in 1883 with a baronetcy.

Owen never lost his love of Lancaster and returned frequently to visit family members. In 1845, he accepted the request from the government to report on 'the Sanitary State of Lancaster' as part of a national enquiry into the public health of major cities. As a result of his expertise in comparative anatomy and his work at the Hunterian museum, Owen was appointed Superintendent to the Department of Natural History, at the British Museum.

He was the driving force behind the plans for a new Museum of Natural History and designed the original plan of the museum building, including the magnificent entrance hall. After completion of the building in 1881, Owen was appointed as director of the museum in 1884, at the spritely age of 80! His portrait stills hangs in the entrance hall.

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FURTHER READING

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1920: Home Office vs Ministry of Health The Home Office takes precedence over the Ministry of Health in respect of drugs policy. This outcome represents the priority of a punitive over a medical approach to drugs and their users.

1921: Dangerous Drugs Regulations

The first statutory expression of the particular privileges of

the medical practitioner in relation to dangerous drugs. The Regulations laid down the formal obligations of doctors and pharmacists with regard to the prescribing and dispensing of dangerous drugs. Many of these obligations still exist today. The Regulations stipulate that all suppliers of dangerous drugs must record relevant transactions in a register, the form of which was prescribed by the Regulations.

1925: Therapeutic Substances Act

The manufacture, but not the sale, of a limited number of products (the purity or potency of which could not be adequately controlled by chemical means) was regulated. Such products included vaccines, sera, toxins, antigens and insulin.

Irish Free State founded
1922

Death of Lenin
1924

Mussolini dictatorship begins
1925