Sir Charles Bell was the younger brother of John Bell (1763-1820), who was to become a well-known surgeon, famous as a teacher and author.\textsuperscript{5,6}

Charles Bell was also tutored in art and attended Edinburgh High School for three years. Spurred by the example of his elder brother, he commenced studying medicine at Edinburgh, attending John’s anatomy lectures. While still a student there, under the guidance of his brother, he taught himself an excellent teacher while continuing his research on the anatomy and the function of the nerves. He ran the hospital famously until 1825.

In 1814, he accepted a position as a surgeon at the Middlesex Hospital and was instrumental in the founding of the Middlesex Hospital and Medical School in London in 1828.

At the battle of Waterloo (June 18, 1815), Bell operated on the wounded soldiers until “his clothes were stiff with blood and his arms powerless with the exertion of using the knife”\textsuperscript{3,4}. It was at Waterloo that he produced the oil paintings and etchings of gunshot wounds now on display in the custody of the Royal College of Surgeons of Edinburgh. About a soldier that Bell had painted, but did not operate upon himself, he wrote: “The ball struck the head of the humerus, and shattered it, passed through and wounded a rib. It was resolved to amputate at the shoulder joint. It was reported to me that the patient sunk from loss of blood. I thought myself entitled to say that the method followed by our army surgeons was too bold, and not suited to common practice, and especially in a case like this, when the patient was reduced by a complication in the wound.”

Bell’s most important works are in the fields of research on the brain and the nerves\textsuperscript{5,6}. His book “An Idea of a New Anatomy of the Brain” (1811), has been called the “Magna Carta of Neurology.” It was first published in private printing – he only circulated one hundred copies to his acquaintances – then published nothing more on the subject for ten years.

In the book, he discusses the functions of the brain and the cerebellum. He describes the double roots of the spinal nerves and published “A system of dissection explaining the anatomy of the human body, etc.” - a work on anatomy containing extraordinary illustrations of his own.

In 1799, Charles Bell graduated from the University of Edinburgh, and was admitted to the Royal College of Surgeons.\textsuperscript{2,3} During the surgical operations he carried out at the Royal Infirmary, he proved himself able in surgery as well as in anatomy.

In 1802 and 1803, Volumes 3 and 4 of his book “Anatomy of the human body” were published. In this joint publication of John and Charles Bell, Charles prepared the parts on the nerves, the sensory organs, and the viscera.\textsuperscript{2,3}

The success of John Bell’s anatomy classes aroused the jealousy of the members of the Faculty of Medicine at the University of Edinburgh, who succeeded in barring him and Charles from practice at the Royal Infirmary or positions at the University. In 1804, with his career in Edinburgh blocked, Charles Bell went to London to make his own future and fortune. In his baggage, he had the manuscript of his first book on his own, “Essays on the Anatomy of Expression in Painting” (1806), the first textbook of anatomy for painters. Besides being a landmark in the exposition of the anatomical and physiological basis of facial expression for artists, the book included much philosophy and critical history of art.\textsuperscript{5,6}

In 1809, during the war, following the retreat from La Coruna, the wounded soldiers were brought to London, where Charles Bell had further ample opportunity to prove his skills as a surgeon. Later, Bell opened a private school of anatomy, and in 1812, took over the Great Windmill Street School of Anatomy, founded by William Hunter (1718-1783).\textsuperscript{4,5} Here he proved anatomy and published “A system of dissection explaining the anatomy of the human body, etc.” - a work on anatomy containing extraordinary illustrations of his own.

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and how he, as the first ever, experimentally investigated their different functions on a living animal – a donkey. Bell found that an irritation of the ventral roots caused cramps, while a disturbance of the dorsal roots produced no visible symptoms. He assumed that the ventral roots connected the peripheral nervous system with the cerebrum, which was the centre of sensibility and motility, while the dorsal roots connected the periphery to the cerebellum, the centre of the vegetative functions of the body. It is doubtful if Bell recognized the significance of his finding at the time, since he still held that all nerves were sensory, classifying them as sensible and insensible.

In the early 1820s, Francois Magendie in Bordeaux, who had heard of Bell’s work from John Shaw, Bell’s assistant at the Great Windmill School, demonstrated that the ventral roots of spinal nerves are motor, the dorsal roots are sensory. Bell had missed the latter fact. A conflict of priority arose, but the scientists reached an agreement, and the rule of the function of the spinal nerves was called Bell-Magendie’s law. This distinction of the nervous traffic is considered the first important step towards an investigation of the activity of the nerves, becoming the starting point for Charles Sherrington’s epoch-making works.

Charles Bell was even more recognized abroad than at home and in 1824, he became the first Professor of Anatomy and Surgery of the College of Surgeons in London. He was known for his well-prepared and elegant lectures. In 1828, at the opening of the University of London, the private Great Windmill Street School became a part of King’s College. Bell was called upon as Professor of Physiology at the University of London. However, he was not satisfied with the conditions at the University and so resigned his position and decided to make a living from private practice.

In 1826, he published the second edition of his then dead brother’s “Principles of surgery”. He was a kindly man and somewhat a dandy in his dress sense. In 1829, Bell received the first medal awarded by the Royal Society – 50 Guineas and later he was knighted by King William IV (1765-1837) in 1831. Despite the honours bestowed upon him, he always remained very humble. In 1835, he accepted an invitation to become a Professor of Surgery in Edinburgh, and in 1836, left London, because “London was a good place to live in but not to die in”. He was by then 62 years of age, but continued his activities as intensively as ever. Another reason for his return was his love for fishing!

In England, he was considered the foremost physician and scientist of his day. At a visit to Paris, Professor Roux concluded a lecture in his honour with the words “C’est assez, Messieurs, vous avez vu Charles Bell”.

There was a captivating twinkle behind his eyeglasses, and he was genial and unaffected. Renowned physicians from all over the world came to visit him in London, and his travels abroad became triumphant processions. He died on 28th April, 1842 at North Hallow, Worcestershire, a happy and satisfied doctor.

Associated Eponyms

Bell’s nerve: The posterior or long thoracic nerve

Bell’s paralysis: Peripheral, usually unilateral, idiopathic paralysis of facial muscles

Bell’s phenomenon: When a patient with peripheral facial paralysis attempts to close the eye, there is an upward movement of the eye and the eyelid on the paralysed side of the face remains open

Bell’s spasm: Involuntary twitching of the facial muscles

Bell-Magendie law: The anterior spinal nerve roots contain only motor fibres and the posterior roots only sensory fibres

Mona Lisa syndrome: Facial muscle contracture that develops after Bell’s palsy when the facial nerves have undergone partial wallerian degeneration and have regenerated

References