ric law of volumes, namely, that the volume increases as the cube of the diameter while the surface increases as the square. This observation has stood the test of time.

SAN FRANCISCO, CALIFORNIA

WALTER FREEMAN

References


CHARLES BELL (1774-1842)

The impetus given to the growth of physiology by the work of William Harvey in the seventeenth century was slow in reaching the study of neurology. Charles Bell wrote in 1811, shortly before he published his first work on the nervous system, that “... there was a singular indifference to the study of the nerves; and an opinion very generally prevailed that as the notion of the ancients had descended to us uncontroverted and unimproved, the subject was entirely exhausted. The hypothesis that a nervous fluid was derived from the brain, and transmitted by nervous tubes, was deemed consistent with anatomical demonstration, and there was no hope of improvement.” Bell rose to this challenge and made numerous contributions to the knowledge of the nervous system, some of which are of prime importance.

Charles Bell was one of the large group of Scottish surgeon-anatomists who left Edinburgh during the eighteenth century and enriched the medical and scientific rank of his training to his and successful Edinburgh surgeon-bystanders to a lend b medical faculty of the Univer...
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Charles Bell

riched the medical and scientific life of London. Charles owed
much of his training to his oldest brother, John Bell, a brilliant
and successful Edinburgh surgeon; but he also suffered as the in-
ocent bystander to a feud between John and members of the
medical faculty of the University of Edinburgh. As a result of

Portrait, courtesy of the National Library of Medicine, Bethesda, Maryland.
these differences, both brothers were denied further positions at the University and the Royal Infirmary, and Charles felt constrained to migrate to London.

The personality and career of Charles Bell largely reflect the influence of his mother. Widowed when her youngest son was but four years old, she very ably assumed the responsibilities of rearing and educating her four sons. She was a remarkable woman, intelligent and artistic, who instilled in her sons high ideals, ambition, cultural interests, and a devotion that bordered on reverence. It is not surprising then that Charles was a sensitive and esthetic person and an accomplished artist.

His arrival in London at the age of thirty found him lonely, frustrated, and discouraged. In contrast to a brilliant beginning on a surgical career in Edinburgh, he found himself totally unknown and disregarded in London. He was, however, sustained by certain triumphs and appreciations. Shortly after his arrival, he published *Essays on the anatomy of expression in painting,* for the instruction of artists, which was based on his anatomical knowledge. This beautiful work won him great recognition in art circles, if not in surgery, and gave him an entree to the artistic and social life of London.

To further his surgical career as well as to provide earnings while it was developing, Bell opened a private school of anatomy, and subsequently purchased the Old Windmill Street School of Anatomy originally started by William Hunter.

The neurological studies of Charles Bell began while he was still a student in Edinburgh when he wrote the section on the nervous system for his brother John's *Anatomy of the human body.* As so frequently happens, the early interest became the lasting preoccupation of his life to which he returned time after time. His contributions in this field cover a wide range. He established the fact that the nerves of the special senses could be traced from specific areas of the brain to their end organs. Above all he demonstrated that the spinal nerves carry both sensory and motor functions and that sensory fibers traverse the posterior roots where the motor fibers run through the anterior roots (Bell's Law). 1 There resulted a bitter and futile dispute as to priority between Bell and the French physiologist Charles Bell, and Bell's palsy have as a result of generations of medical study. The disease was of varied etiology: ganglion and Bell's palsy are a two\n
From its full beginnings, one of fame and brilliance, Middlesex Hospital and Mutter, he attended the works. There was a captivating twinkle in his eye, and his genial and unaffected charm attracted many visitors to London, and his patients. From a survey of the field of neurology at this time, one can see the influence of the work of these neurological scientists of history.

CHICAGO, ILLINOIS

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Bell and the French physiologist, François Magendie, who more definitively established the separate functions of the nerve roots by animal experimentation.

Bell also described muscle sense or proprioceptive sensation. He demonstrated that the fifth cranial nerve was sensory to the face and motor to mastication, whereas the seventh controlled the muscles of expression. The eponyms of the respiratory nerve of Bell and Bell’s palsy have made his name familiar to all subsequent generations of medical students. The facial palsy described by him was of varied etiology: gunshot wounds, syphilis, and even going by an ox.

From its full beginnings, the career of Charles Bell evolved into one of fame and brilliance. He was instrumental in founding the Middlesex Hospital and Medical School. As surgeon to this institution, he attended the wounded after Corunna and Waterloo. There was a captivating twinkle behind his spectacles, and he was genial and unaffected. Renowned physicians from all over came to visit him in London, and his travels abroad became triumphant processions. He received many honors including knighthood, conferred by the enthusiastic Lord Brougham. His achievements in the field of neurology have established him as one of the great surgical scientists of history.

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