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HISTORICAL NOTE

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Marie Jean Pierre Flourens (1794–1867): an extraordinary scientist of his time

Marie Jean Pierre Flourens was a French physician, famous for various significant discoveries relating to the nervous system, cerebral localisation and brain functions. He was known for his studies on brain physiology. He was one of the pioneers in the usage of experimental methods in neuroanatomy.¹

He was born on 15 April 1794, in Maureilhan, France. He received his medical degree from the University of Montpellier in 1809. He then went to Paris and worked with botanist Agustin de Condelle (1779–1841) and palaeontologists Georges Cuvier (1769–1832), and later became attracted to the study of neurophysiology. In 1833, Flourens became a Professor of Anatomy at the College de France. In 1838, he was returned as a deputy for the commune of Béziers. He was elected to the French Academy in 1840, in preference to Victor Hugo (1802–1885), and in 1845 he was given the légion d'honneur. He withdrew completely from political life in 1848 and accepted the Professorship of Natural History at the College de France in 1855.

In the 19th century, important research on vestibular and otological disorders was being performed. Flourens made the first experimental observations on the function of the vestibular labyrinth by extirpating each semicircular canal in pigeons.² After the semicircular canal was cut, he found anomalous head movements in pigeons. Hearing was not affected when he cut the nerve fibres to these organs but it was discontinued when he cut the basilar papilla. Flourens proposed that the semicircular canals were involved in the maintenance of posture and balance. He hypothesised that a lesion in the semicircular canals was responsible for the previously described vestibular symptomatology.^{3,4}

Flourens was accepted as a pioneer of the modern theory of brain function.⁵ According to this theory, the brain acts only as a functional entity although specific functions are controlled by specific parts of the brain. Flourens reached this theory using ablation and stimulation methods and many experimental investigations on mammalian species, especially rabbits and pigeons. Removing the cerebellum, the animal's muscular coordination and sense of equilibrium disappeared. He accepted that the cerebral cortex, cerebellum and brainstem functioned globally as a whole, equipotential and in conjunction with every other part. Moreover, all cognitive functions were interrupted in pigeons when the cerebral hemispheres had been taken away.⁴ Flourens progressed the work of Julien-Cesar Legallois (1770–1814) on respiratory control functions of the medulla oblongata. He reported that the medulla was responsible for vital

functions, such as circulation and respiration. He observed that devastation of the medulla oblongata resulted in the death of the animal.⁶

Phrenology was developed by Franz Joseph Gall (1758–1825). Its principles were that the brain is the organ of the mind, and that it consists of independent functioning units. These areas were considered to be responsible for different intellectual aptitudes and character traits, and the skull bone to reflect these differences. But Flourens rejected this theory and challenged Gall's localisationist view. The basic theory of phrenology, that personality is determined by skull shape, is now accepted as incorrect.⁷

Apart from his neurophysiological studies, Flourens described the anaesthetic properties of chloroform and ethyl chloride.^{8,9} Flourens was a mentor for his pupils. Edmé Félix Alfred Vulpian (1826–1887), Gabriel Gustav Valentin (1810–1883) and many others studied under his supervision and made important contributions to neuroscience. Flourens died at Montgeron, near Paris, in 1867 and left behind him many articles and books.

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