PAUL BROCA (1824–1880)

Pierre Paul Broca was born at little Sainte-Foy-la-Grande, between Bordeaux and Bergerac, close also to the most famous remains of man's neolithic past. He came from combative Gascon and Huguenot stock. His father, a country doctor and former Napoleonic surgeon, was noted for "unflinching probity, courage and grave irony," his mother for "great intelligence" and "a prodigious memory." Paul’s plenitude of gifts—as an investigator, innovator and rebel, yet also as a moderator and organiser—was already apparent when he was a student leader. Professor of surgery eventually, he started his career in Paris at seventeen, and was the youngest prospector and Secretary of the Société Anatomique ever. There he described muscular dystrophy as a primary affection of muscle before Duchenne; rickets as a nutritional disorder before Virchow; and the venous spread of cancer independently of Rokitansky. Among his 500-odd publications—"he never wrote anything mediocre," a contemporary said—is a classic 900-page monograph on aneurysms, as well as the first experiments on the continent using hypnotism for surgical anesthesia. Much resisted by the medical establishment in France, the introduction of the microscope into the diagnosis of cancer was partly due to his youthful efforts. So was, a little later, and throughout his life, his foundation of Anthropology as the science we know today. Among the plethora of novel subjects he treated was Cro-Magnon man and neolithic trephination. In 1858 and 1859 his heretic denial of the immutability of race and species—the offensive central idea also of Darwin's more famous work that year—compelled Broca to establish a platform of his own: the world's first Anthropological Society, followed by his School and Institute of Anthropology.

On this background—aided by an early association with François Leuret (1797–1851) and Pierre Gratiolet (1815–1865), the comparative anatomists, and with Jean Baptiste Bouillaud (1796–1881), the intrepid developer of the ideas of Gall—Broca contributed to neurology the concept of functional localization by cerebral convolution. This, in the 1860's, opened the way for Hitzig, Ferrier, Munk, Wernicke, etc., on the one hand; to mid-twentieth century ideas about the inferomesial aspect of the hemisphere—the "great limbic lobe" or "limbic system"—on the other, in 1878 and 1879.

It was a memorable day when Broca demonstrated before the Société d'Anthropologie in Paris—with his old father looking on in silent admiration—the brain lesion of his first patient who had suffered from aphémie (renamed aphasia by Trouseau). From

Portrait, courtesy of Dr. Maurice Genty, Académie de Médecine, Paris, France.
this and subsequent observations he concluded that the integrity of the posterior part of the left third frontal convolution was indispensable to articulate speech, and he therefore termed this region the *circonvolution du langage.* (Later Ferrier referred to it as "Broca's convolution.")

On March 24, 1863, Broca's cautious view about the unheard-of dominance of speech by the left cerebral hemisphere was received by the Académie de Médecine. On the same date and on the same page it is recorded that Gustave Dax (1815–1893) deposited a hitherto unpublished memoir by his deceased father Marc, written in 1836. In a series of forty-odd patients Marc Dax (1771–1837) had correlated loss of speech with right hemiplegia, due in some cases to known left hemisphere trauma. Much heat was generated over these interpretations: first in the series of weekly meetings of the Académie de Médicine in 1865; three years later at the session of the British Association for the Advancement of Science in Norwich, where both Broca and Jackson expressed their latest views; unfortunately their discussion, if any, is not on record. Posthumously Broca was again challenged by Pierre Marie, his former interne. In 1906 Marie sought out the very brain described by Broca: it had a parieto-temporal lesion in addition to the frontal one insisted on by Broca.

Broca's and Wernicke's ideas about circumscribed localization in the cerebral cortex are giving way to Jackson's approach; but this does not reduce the importance of his discovery, nor will it be forgotten that it was Broca, the meticulous observer, who established in principle the functional significance of the various areas in the cortex.

Broca was strongly built, with an expansive forehead and lustrous brown eyes. Fiery, righteous, but benevolent, and an excellent raconteur, he was adored by his associates, and it is said that those who were once his friends were his friends for life. While still in his thirties he furthered Brown-Séquard's difficult career. Standing for many years at one corner of the Faculté de Médecine, until carted off on orders by the German Army in the Second World War, was Broca's statue, with that of Vulpian not far off. Here he could still survey Paris much as it was in 1871 during the Commune when, as vice-president of the Council of Public Assistance, Broca risked his life to spirit seventy-five million francs from that institution's treasury to the government in Versailles. To do this he devised the bold scheme of hiding the assets, stuffed into travelling bags, on an old wagon loaded with potatoes; the cart was safely driven past the Communard-manned gate of Paris. He received not so much as a vote of thanks from the conservative Government.

Broca was married to the wealthy daughter of Dr. J. G. A. Lugol (1786–1851), of iodine fame. Both his sons distinguished themselves: Auguste as professor of pediatric surgery, André as professor of medical physics. Politically active, rather far left of center, and a towering public figure, Broca was elected in 1880 as a lifetime member of the Senate, to represent "France et Science"—only for six months, however. At fifty-six, still at the height of his restless powers, he suddenly died, presumably from coronary occlusion.

References


LOCKHART CLARKE (1817–1880)

His English neurologist was born in London. While he was still a small boy, his father died; and his mother, who had been left with adequate financial means, took her family of seven to France for their education. As a student in France, Clarke is said to have shown no unusual ability and to have been regarded by his family as rather indolent. But after returning to England in 1830, he displayed more interest in intellectual pursuits and later chose a career in medicine, a profession which had already claimed his grandfather and one of his elder brothers. After receiving his medical training at Guy’s and St. Thomas’ Hospitals, he was licensed by the Apothecaries Society and went to live with his mother at Pimlico where he entered into the general practice of medicine.

It was during the period of his life from 1851 to 1868, while engaged in general practice, that Clarke carried on those detailed investigations which have given his name to posterity. In addition to fundamental investigations on the anatomy and histology of the central nervous system, he published a number of papers on various clinical subjects, stressing the view that much could be learned of the function of the nervous system in man by carefully correlating the clinical and pathological data.

Clarke’s investigations, carried out with great skill and characterized by extreme thoroughness, were illustrated with excellent drawings from his own hand. He is best known for his researches on the spinal cord, which he fixed in spirits of wine, then turpentine. He established the presence of the nucleus dorsalis, called by him the “posterior vesicular column” (“column of Clarke”), and described the nucleus intermediolateralis. He was the first to distinguish the lateral from the medial cuneate nucleus (he called the lateral nucleus the “outer restiform nucleus”), though today the lateral cuneate nucleus is named after von Monakow because it was he who traced its fibers to the cerebellum. Another contribution was the introduction of the method of mounting cleared sections in balsam, a major advance in histological technique. Several of his most important publications on anatomy (e.g., “Clarke’s column”) are to be found in the Philosophical Transactions of the Royal Society of London from 1851 to 1868. As a close rival of Stilling, he was found wanting with regard to the nerve fiber. Stilling had described the herring bone-patterned lines in the myelin of nerve fibers in 1855, and illustrated them in 1856;