

Stanley Finger, Paul Eling

Franz Joseph Gall, Naturalist of the Mind, Visionary of the Brain

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When considering Franz Joseph Gall (1758–1828) and his craniology (organology), there is a common tendency to focus on caricatures rather than the original concept. Two experienced neuroscience history researchers, Stanley Finger and Paul Eling, offer us an opportunity to examine our prejudices and correct our ignorance with the most complete biography ever written on this German physician who, ahead of his time, can also be considered a true European. In this voluminous 564-page book, the authors go beyond the story of a life and present a real history of the origins of neuroscience, in particular, neuropsychology, in 20 information-dense chapters that remain highly readable, even when English is not a reader's native language. The rich, high-quality illustrations also serve to balance the text.

The origin of Gall's theory is explored in detail, providing us with a history of physiognomy from ancient times to Giambattista della Porta (1535–1615) and Johann Caspar Lavater (1741–1801). There is also an exhaustive review of the progressive accumulation of knowledge of brain functions, starting in antiquity. The first third of the book is no less than an in-depth history of neuroscience over 2 millennia, including portraits of so many illustrious physicians and philosophers that it is impossible to mention all of them here.

Stanley Finger and Paul Eling show how Gall, imbued with all this knowledge, built his theory by expanding beyond the classical mental faculties of perception, cognition, and memory – to account for differences in human behavior that underlie social interaction and culture. With no recourse to metaphysics and no attempt to find a hypothetical location for the soul, Gall was an accomplished neuroanatomist, developing a new, bottom-up approach to examine the brain, from the spinal cord to the frontal lobes, based on a phylogenetic view of nervous system evolution based on his vast knowledge of animal and human comparative anatomy. Before Charles Darwin, Gall compared the brains and cranial morphologies of various animals relative to their specific abilities, having developed an innovative view of the evolutive continuity of the animal world. Based on this comparative anatomy and psychology, he conceived of a cerebral physiology that, instead of being holistic, was distributed over a group of specialized areas, each specific to a concrete mental faculty, ultimately settling on 27 faculties, each with its

own cortical organ. He was opposed to vivisection and experiments involving localized cortical lesions, because he considered their effects too complex to confirm a specific localization. For Gall, a talent was correlated with more intense activity and greater development of an organ, which could be reflected in overlying cranial features. These bumps or depressions could be detected visually or by palpation. Thus, an expert, and this qualification is important, who palpates a skull is able to judge the attributes of the subject.

Over a quarter-century, Gall continued to accumulate data to advance his theory, although he tended to exclude as unsuitable those examples that contradicted it, which tarnished the scientific quality of his approach, innovative though it was in many other ways. The role of Johann Gaspar Spurzheim (1776–1832) in Gall's work is well known, but this biography also draws attention to those assistants who preceded him, such as Karl Franz Anton Ritter von Schreibers (1775–1852).

After carefully analyzing the political and ideological events that led Gall to leave Vienna (he was not forced to depart), where he was widely known and respected as a physician, Stanley Finger and Paul Eling provide a detailed description of the extensive travels that took their protagonist across Germany, Denmark, the Netherlands, and ultimately into France. The people who came to listen to Gall at each of his stops are well depicted, as are Gall's persevering efforts in each location to visit the prisons and to observe the most talented writers, musicians, philosophers, and so on, in order to advance his theory. Gall also proved himself to be a shrewd businessman, successfully capitalizing on the curiosity he generated and maintaining it through his ability to advertise his services and make his findings accessible to a wider public.

His arrival in Paris marked the culmination of his European tour. Arriving on October 30, 1807, he was preceded by several publications aimed at explaining and praising his work, including those by Jean-Baptiste Demangeon (1764–1844) [1] and Jean-François Normand (1770–1813) [2]. A dispute characteristic of the Parisian medical milieu immediately developed between those who valued Gall as a scholarly researcher and thinker and those who considered him nothing more than a clever charlatan, who took advantage of the public's appetite for the marvellous and its tendency to accept the irrational without critical appraisal.

On November 9, 1807, before an assembly of illustrious scientists led by Étienne Geoffroy Saint-Hilaire (1772–1844), Gall performed a dissection of the nervous system, using his working from the periphery up method. His demonstration was well received. On January 15, 1808, he began a cycle of lectures, which were later collected and published by Philibert Adelon (1782–1862) in the *Gazette de France*, and launched a successful, high-profile medical practice for Gall. What had started off as a temporary stay became indefinite: Gall would never return to Vienna, obtaining French

nationality on September 29, 1819. In Paris, he found all the technical and material resources he needed to accomplish his objective of publishing his anatomical and physiological research, and he was able to live lavishly.

Encouraged by the warm welcome he initially received, Gall sent *Un Mémoire* to the French Academy of Sciences in 1808. But Georges Cuvier (1768–1832), the rapporteur of the commission, tasked with analyzing this submission, recommended rejecting its conclusions. Cuvier was undoubtedly concerned about the response of Napoleon, whose xenophobia and intense nationalism would not tolerate French physicians and scientists being taught chemistry by an Englishman (Humphrey Davy) and anatomy by an Austrian. As Stanley Finger and Paul Eling explain in detail that this dissertation covered only his personal method of studying the anatomy of the nervous system, supported by an original, innovative hierarchical organization of its elements that distinguished between white matter and gray matter; it did not cover his craniology or revolutionary doctrine of higher mental faculties. In summary, the rejection seems to have been more political than scientific.

Gall began his “*Great Work*” while still in Vienna and continued to add to it throughout his travel in Europe. The first version was published in 1810–19 and had the title: *Anatomie et physiologie du système nerveux en général, et du cerveau en particulier* (Anatomy and physiology of the nervous system in general, and of the brain in particular) [3]. According to Stanley Finger and Paul Eling, the work, consisting of 4 volumes of text and a magnificent atlas of 100 engravings, sold for a price now equivalent to more than EUR 5,000. Being aware that this exorbitant sum hindered the dissemination of his research, between 1820 and 1825, Gall published a version without the detailed anatomy and atlas, making it much less expensive, entitled “*Sur les fonctions du cerveau et sur celles de chacune de ses parties: avec des observations sur la possibilité de reconnaître les instincts, les penchans, les talens, ou les dispositions morales et intellectuelles des hommes et des animaux, par la configuration de leur cerveau et de leur tête*”. It again covered what he made a point of calling his *organologie*, rather than craniology (or phrenology, a term he never used) and, as with his “great work,” he personally financed its publication. These 6 volumes in French were translated into English and appeared in 1835 (after his death) as *On the Functions of the Brain and of Each of Its Parts: With Observations on the Possibility of Determining the Instincts, Propensities, and Talents, Or the Moral and Intellectual Dispositions of Men and Animals, by the Configuration of the Brain and Head*.

Stanley Finger and Paul Eling devote several chapters to analyze Gall’s “*organologie*” and the 27 faculties individualized by Gall. Notable among them is the chapter entitled “*New Perspectives on Insanity and Criminality*,” which uses the history of alienism in the 19th century and the study of criminality to show how Gall scientifically approached social problems, laying the groundwork for the new sciences of sociology and anthropology, while also transforming criminology.

Another chapter examines Spurzheim and Gall’s voyages to England. As early as 1815, Spurzheim published his first book in English. This work, along with his lectures throughout 1814, received scathing reviews from John Gordon (1786–1818) [4] and Peter Mark Roget (1779–1869) [5] or its “*absurdities*.” This contributed to the conflict between Gall and Spurzheim, with Gall accusing his long-time assistant of offering a faulty version of the

doctrine and not giving him proper credit for the basic concepts, including his new ways of viewing faculties and their cortical organs.

Stanley Finger and Paul Eling go on to examine the conflict between Gall and Jean Pierre Flourens (1794–1867), the disciple of Geoffroy Saint-Hilaire (1772–1844). Initially, Gall’s brain dissection technique appealed to Flourens. He carried out ablative vivisection experiments on animals, but it was more to understand how the nervous system receives sensations and executes voluntary movements than to challenge the localization theory of higher faculties developed by Gall. When Georges Cuvier first summarized Flourens’ experiments, however, he presented them as a strong evidence against Gall’s doctrine, triggering strong responses from Gall. Flourens went on to side with Cuvier, as can be seen in his *Examen de la phrénologie*, published 14 years after Gall’s death.

After relating Gall’s sad final years, which were marked by recurrent strokes, Stanley Finger and Paul Eling offer us an excellent twentieth chapter, which convincingly rehabilitates Gall’s research and presents him as a visionary with regard to current neuroscience discoveries. Gall was a victim of misunderstanding, and his posthumous image suffered due to the caricatures that were done to amuse readers of the mainstream press, starting in the 19th century. Since then, he has most often been mocked by detractors who have not read his work. For Stanley Finger and Paul Eling, “*Gall is the first scientist to argue with supportive evidence and in public venues that the cerebral cortex is not a single organ but rather a collection of special organs responsible for the higher functions of mind. In doing so, he formulated the modern framework for neurophysiology, neurology, neuroanatomy, psychology, and more, even though some his methods were faulty.*” Could Paul Broca (1824–1880) have localized language in the basal region of the left frontal lobe (Broca’s area) in 1861, could Jean-Martin Charcot (1825–1893) have written, in 1877, *Contribution à l’étude des localisations dans l’écorce des hémisphères du cerveau* (Contribution to the study of localizations in the cortex of the cerebral hemispheres) if Gall had not opened the way to this type of research?

Like all of the best authors of neurological history, Stanley Finger and Paul Eling provide an abundant bibliography and 2 indexes, one listing the names of all people cited, with their dates of birth and death, and one general index. The result is not only a biography of Franz Joseph Gall but also a research tool.

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Olivier Walusinski, MD

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- 2 Normand JF. [Exposition de la doctrine physiognomonique du Docteur Gall ou Nouvelle théorie du cerveau considéré comme le siège des facultés intellectuelles et morales](#). Paris: Chez Henrichs; 1804.
- 3 Gall FJ and Spurzheim JG. Anatomie et physiologie du système nerveux en général, et du cerveau en particulier : avec des observations sur la possibilité de reconnoitre plusieurs dispositions intellectuelles et morales de l'homme et des animaux, par la configuration de leurs têtes. Paris: F. Schoell; 1810–1819.
- 4 The Scottish John Gordon was a lecturer in anatomy and physiology at Surgeon's square in Edinburgh (the medical center for science and education in the city) while also serving as surgeon there. He has written much books reviews, attracting a wide range of readers by a reputation for caustic language. John Gordon. Dictionary of National Biography. London: Smith, Elder & Co.; 1885–1900.
- 5 Roget served as Secretary of the Royal Society of London for 21 years and was a major contributor to the Encyclopedia Britannica. He is today far better remembered for his Thesaurus, working on this word list for almost 50 years. Emblen DL. Peter Mark Roget: the word and the man. London: Longman; 1970.