Korbinian Brodmann (1868–1918)

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Korbinian Brodmann was born in Liggersdorf (Hohenzollern, Germany) on November 17, 1868. Though of humble origin—his father Joseph was a farmer—Korbinian would study medicine at the Universities of München, Würzburg, Berlin and finally Freiburg im Breisgau where he obtained his MD on February 21, 1895. He then intended to settle in Schwarzwald as a general practitioner, but after having

caught diphtheria, he temporarily opted for a job he considered more propitious to his convalescence: a position of assistant at the Neurology Department in the Bavarian seaside resort Alexanderbad. This choice proved to be decisive, because since that time Brodmann devoted himself to the study of the neurosciences for the remainder of his life. He, therefore, honed his knowledge of neuroanatomy and pathology at the University of Leipzig, where he focused on chronic ependymal sclerosis. Subsequently, he acquired psychiatry training in Jena (under Otto Binswanger) and Frankfurt-am-Main (where he met Aloïs Alzheimer, who encouraged him to carry on neuroscience research). From 1901 to 1910, he worked as a researcher with Oskar and Cécile Vogt at the Berlin Institute of Neurology, a period leading to the most important publications of his career. In 1910, Brodmann became extraordinary professor at the Tübingen University, settled later in Halle an der Saale (1916) and München (1918). He married Margarete Francke on April 3, 1917, had a daughter called Ilse in 1918, and died of septicaemia the same year, on August 22 [7].

From 1903 to 1908, Brodmann published many papers on cortical organization in the *Journal für Psychologie und Neurologie* of Leipzig. These articles paved the way to his masterpiece that was to appear in 1909 [2], a synthesis of all these years of study on comparative cytoarchitectonics of the mammalian brain cortex (a second edition was published in 1925, and a facsimile reprint was made available in 1985 by Johann Ambrosius Barth, the publishing house of the 1909 original edition). This 324-page book includes, on p. 131, one of the most often reproduced neuroanatomical illustrations of all the times [6]: Brodmann's areas depicted on the lateral and medial aspects of the human brain cortex.

Brodmann tackled the question of cortical organization from three complementary points of view: firstly, the

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elementary histological localization in the cortex; secondly, the laminar layout of neuronal cell bodies (and eventually nerve fibres); and thirdly, the topographical organization of cerebral gyri. Carl Benda supplied him with human brains, and Lutz Heck and Oskar Heinroth (of the Berlin zoological garden) with an impressive number of animal brains of various orders: Primates, Prosimiae, Chiroptera, Insectivora, Carnivora, Pinnipedia, Rodentia, Ungulata, Edentata, Marsupialia, Monotremata, among others. The areas Brodmann could differentiate are indicated by a simple Arabic number, from area 1, or *area postcentralis intermedia* (intermediate part of postcentral gyrus), to area 52, or *area parainsularis* (transitional cortex between insula and superior temporal gyrus). However, it should be pointed out that Brodmann's areas are not 52 in number as it may appear, but only 44 because areas 13–16 and 48–51 do not exist. Finally, the numbers simply indicate the order in which Brodmann studied them [4].

Numerous cytoarchitectonic brain maps have been described from the late nineteenth century up to the present time [1, 3, 5], but Brodmann's map survived all its competitors in common vocabulary. The major reason for this success is probably the relatively small number of the areas (52, in fact 44) and the simplicity of their names (a simple Arabic number). This favourably contrasts with the systems proposed by other researchers: a large number of areas—several hundreds on Exner's map (1881) and an extreme complexity of names—a succession of capital or small letters and numbers including Greek characters, such as in Brockhaus' (1940) or Gerhardt's (1940) terminologies.

Korbinian Brodmann's subdivisions of the cerebral cortex proved to be much more easy to remember.

In the funeral oration dedicated to his colleague, the German neuropsychiatrist, Emil Kraepelin, said that Brodmann had received "God's blessings". Six years later, Spielmayer lamented the fact that Brodmann's genius had not been acknowledged during his life by German Universities. But talent will always be acknowledged in the end: over a century after the publication of his book, Korbinian Brodmann still remains the ultimate reference in cortical cytoarchitectonics.

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