

## *Foreword*

When I began my work in the Neurobiological Laboratory (\*1) of the University of Berlin eight years ago the task befell me to undertake a topographic analysis of the human cerebral cortex based on its cellular structure, in the context of the research programme of this institute. The practical goal of this task was essentially to provide a description of the normal histological structure of the whole human cerebral cortex, which had long been felt necessary by neuroanatomists and pathologists. In contrast to earlier research of a similar nature, the emphasis would be not only on gross divisions of the brain, such as lobes and gyral complexes, but also on the smallest gyri and parts of gyri, in order to obtain a complete picture of cortical structure and all its local modifications, and thus try to describe topographical parcellation and localisation in the cortex that would also be of value for clinicians.

But during the course of these investigations the need soon became apparent to place the whole work on a much broader, developmental, and above all comparative anatomical, basis if it was to help us understand the structural plan of the cerebral cortex and explain the astonishing structural complexity based on common organisational principles that were revealed as one penetrated more deeply into the subject. Therefore to begin with, I was obliged to abandon the extremely complicated and unfathomable human brain and try to obtain an insight into the structure of the cerebral cortex using an ontogenetic approach in simpler forms. This means that the originally envisaged task was modified,

and at the same time broadened. The object of the research was no longer merely the human central nervous system, but that of the whole mammalian class, and in the course of the years material from all the main groups of mammals was included in the investigation, each with at least a few of their important representatives.

The following descriptions contain the results and a synthesis of these studies. Respecting the aim of the book to expose the essentials of a theory of comparative localisation in the mammalian cortex, detailed data are only reproduced in so far as they appear indispensable to the establishment of the principles of topical cortical development. Thus anyone looking for practical information on the human will often be disappointed. It will be my next priority to correct this deficiency as soon as possible, if circumstances permit. Many details are already published in a current series of communications on histological localisation in the cerebral cortex in the *Journal für Psychologie und Neurologie* (1903-1908) (\*2). But I am also conscious of only being able to offer incomplete data in other respects. The theory of anatomical localisation is, like physiological and clinical localisation, still in a state of development. The directions to take to reach them are not immediately attainable. So many problems must remain unresolved, some can be only provisionally unravelled, and for yet others the way ahead can only be sketched out roughly. Thus this book should not, and cannot, be more than a first draft or outline of the new theory.

The publication of the results of my research in their present form was made possible by the generosity of the trustees of the Berlin Municipal Benefaction (\*3) who awarded me a substantial grant towards my research costs with the help of the Jagor Foundation (\*4). My duty to express my gratitude publically to the trustees of this Foundation is even greater because my repeated attempts to obtain support for the same purpose from the Science Research Fund of Berlin University failed due to the opposition of the authorities of the Medical Faculty (\*5).

I owe particular thanks to Professor Heck and Dr. Heinroth of the Berlin Zoological Garden for the great amiability with which they constantly supported and encouraged my work with donations of valuable animal specimens.

I thank Professor Benda for kindly providing human brains.

Finally, my duty to express my gratitude to my collaborators in the Neurobiological Laboratory, and especially to its Director, Dr Oskar Vogt, is obvious from the years of work in common that unite us. Without the technical organisation of this institute and without the continued active participation of my collaborators the achievement of my goals would have remained entirely impossible.

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