

## Commentary

# Wilder Penfield and Herbert Jasper: Epilepsy and the Functional Anatomy of the Human Brain

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The year 2024 marks the 70<sup>th</sup> anniversary of the publication of this remarkable book (Figure 1),<sup>1</sup> one of the best clinically based descriptions ever written about human cerebral localization. Its publication is a milestone in Canadian clinical and basic neuroscience. The book presents the contributions of the Montreal Neurological Institute, from its establishment in 1934, with related departments at McGill University and Université de Montréal. These contributions were built on a “prelude” of neurological and neurosurgical contributions of McGill University.<sup>2</sup>

The authors were two giants of Canadian epileptology, neurosurgeon Dr Wilder Penfield and neurophysiologist Dr Herbert Jasper, both of whom have national Canadian awards named after them, with one chapter on medical management of epilepsy provided by neurologist Dr Francis McNaughton. The book emphasizes insights provided by “the Montreal school” approach to the surgical management of epilepsy involving 750 awake patients at a time when pneumoencephalography and cerebral angiography were the only available imaging modalities. The semiology of seizures, scalp electroencephalography (EEG), electrocorticography, patient experiences with intra-operative cortical stimulation and the results of surgical resections are described in meticulous detail accompanied by informative illustrations and operative color photographs. Some of the content was derived from three previous textbooks by Dr Penfield and colleagues:<sup>3–5</sup> *Epilepsy and Cerebral Localization* in 1941, *Cerebral Cortex of Man* in 1950 and *Epileptic Seizure Patterns* in 1951.

Extensive clinical observations are used to describe in great detail many aspects of human cortical function and localization that remain relevant today. Examples include the “homunculi” of motor and sensory cortices, the supplementary motor and secondary and supplementary sensory areas, and precise descriptions of the function of the visual, auditory and limbic cortices. Although several examples of “disagreeable” olfactory sensations such as that of burning rubber are described, the famous smell of burning toast is not one of them.

EEG was in its infancy, and Dr Jasper and his colleagues made many original observations and contributions. Insights into consciousness and its components and various classifications, including clinical-anatomical, etiological and chronological, are provided. While the concept of a “centrencephalic system” proposed by Penfield and Jasper to explain the mechanism of generalized seizures is no longer accepted, the theory was influential in establishing the role of the thalamus in the generation of absence and other generalized seizures.

The book reviews provided in *Neurology*, *Brain*, *JAMA*, *Academic Medicine*, *AMA Archives of Neurology* and *AMA Journal of Diseases of Children* in 1954 and 1955 recognized the remarkable insights recorded in the book, which still stands as a “worthy monument to the valuable contributions made by Penfield and his collaborators” (Walter Russell Brain, *Brain* 1954; 77[4] 639–647).<sup>6</sup> We are the students of their students, and we value their mentors’ lessons passed on to us.

If you wish to read this classic textbook, it is available to borrow free online at The Internet Archive (archive.org). Otherwise, you can buy your own copy online, *Epilepsy and the Functional Anatomy of the Human Brain*. Wilder Penfield and Herbert Jasper. Little, Brown and Company. Boston. 1954. The price has risen somewhat to \$700–\$900 US or 540–700 £.

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Dr Richard S. McLachlan wrote a second draft of the paper with some additions.

Dr Shashi S. Seshia also helped write the final draft of the paper.

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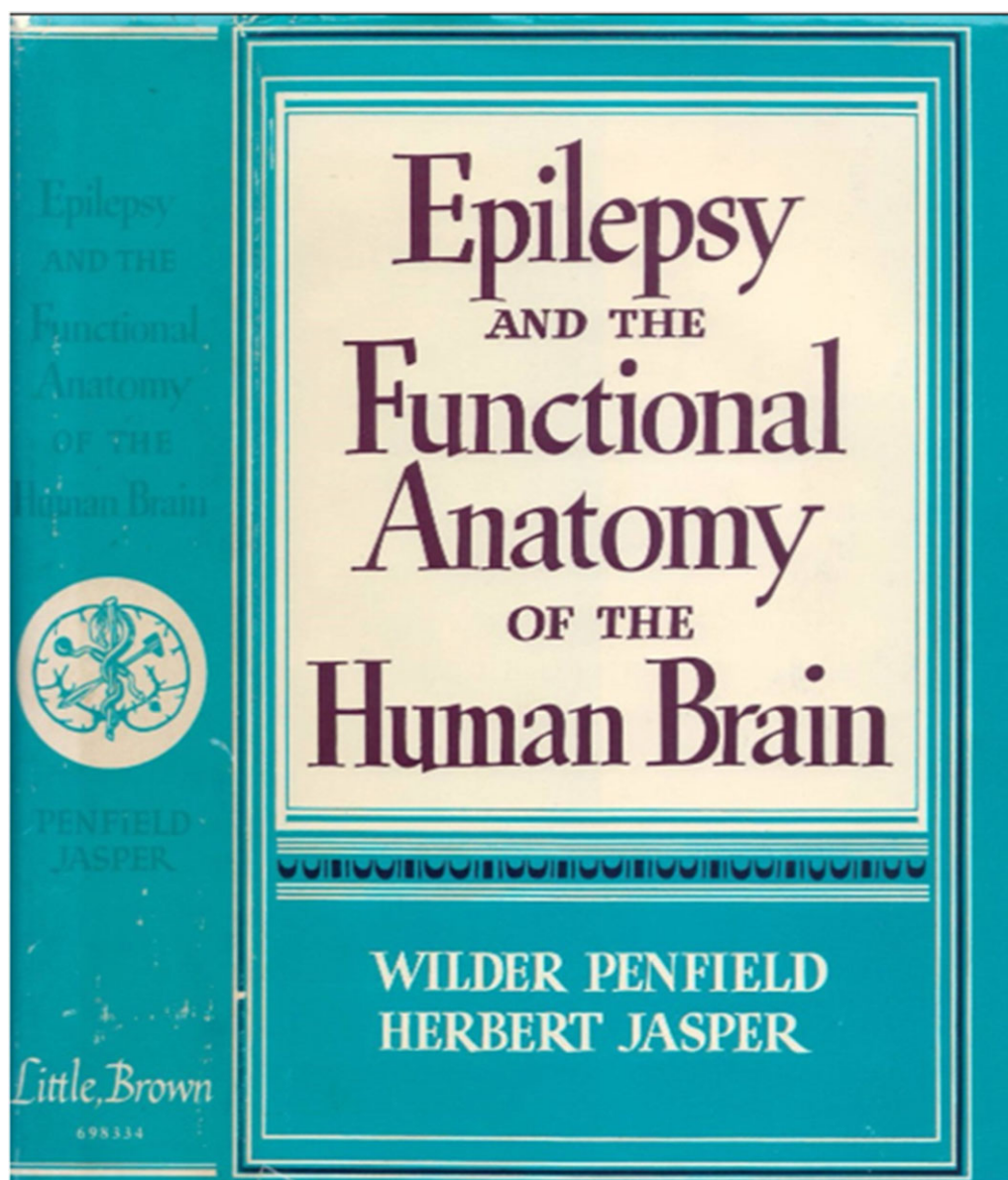
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**Figure 1.** Dust Jacket for the book.

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