INTRODUCTION

Cerebral localization

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CEREBRAL localization has a complex and intriguing history. From Hippocrates, who recognized the laterality of the hemispheres, to Gall, who attempted to localize emotions and higher cortical functions through the pseudoscience of phrenology, to Wilder Penfield, who applied corticography to clinical localization in the operating room, the field of cerebral localization has inspired a rich and colorful literature. All of neurosurgery, in fact, is based on localization of lesions and the effect that they produce with respect to neurological signs and symptoms. Localization is the fundamental basis for surgical precision. As such, it constitutes the core of the development of modern neurosurgery.

Modern neurosurgery is indebted to many pioneers of cerebral localization who were physicians, anthropologists, neurologists, behavioralists, psychiatrists, and neuroscientists. Neurosurgery's own literature includes a number of monumental works, such as Edwin Boldrey's 1936 thesis (not included in this issue of *Neurosurgical Focus*), written when Boldrey was a first-year neurosurgical resident under Wilder Penfield.¹ The thesis reported results of electrical stimulation of 105 human cerebral cortices. Many of these early neurosurgical studies represented incredible efforts, such as this first large-scale study of human cortical stimulation under local anesthesia as part of "treatment" for epilepsy and brain tumors, which was the first study to actively identify and separate motor and sensory functions as well as other brain functions. Such studies aimed at synthesizing a system of knowledge and the logic of cerebral function and localization, and they are a tribute to the indelible pioneering spirit of neurosurgeons.

This issue of *Neurosurgical Focus* has surveyed the intellectual history of the field of cerebral localization and gives a broad view of this many-faceted topic. It includes articles describing some of the historically significant individuals, milestones, and events that have marked the development and deployment of cerebral localization. The issue begins with Folzenlogen and Ormond's overview of

cortical functional localization with relevance to neurosurgery. This is followed by discussions of the critical history of language localization by Leblanc, Rahimpour et al., and Kundu et al.; a paper by Patra et al. about an early brain stimulation case performed by Roberts Bartholow; papers on neurological signs with long and complex histories by Carrasco-Moro et al. and Kosty et al.; a paper on Santiago Ramón y Cajal's identification of cortical tracts by Mora et al.; two papers on the critical history of brain atlases and cortical localization involving Bartolomeo Eustachio and Jean Talairach by Dario et al. and Harary et al., respectively; and a paper on the science and relationship of the thalamus to cortical localization by Serra et al. The issue concludes with a poignant account by Fana et al. of three giants of the science of cortical organization who faced personal challenges during the Nazi era.

We hope that the readership of *Neurosurgical Focus* will find these excellent scholarly papers informative, enjoyable, and a reflection of the remarkable legacy of neurosurgery.

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Disclosures

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