

material, which is presented in a humorous, appealing style that I would welcome from more historians. A thoroughly enjoyable and rewarding read.

**Matthew Smith**

University of Strathclyde, UK

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**Katja Guenther**, *Localization and its Discontents: A Genealogy of Psychoanalysis and the Neuro Disciplines* (Chicago, IL; London: University of Chicago Press, 2015), pp. 296, \$35.00, hardback, ISBN: 978-0-226-28820-8.

At just under 300 pages, this brilliant book punches far above its weight. Katja Guenther, associate professor of history of science at Princeton, has worked as a physician in hospitals in Germany, France and the UK. She also has a research degree in neuroscience from Oxford University and a PhD in history of science from Harvard. This combination of clinical experience, scientific expertise, native German language skills and historical training makes her an ideal guide to the intricacies of nineteenth- and twentieth-century neuropsychiatry.

Guenther begins with a fissure in the contemporary sciences of the brain. On the one hand we have the avalanche of data issuing from fMRI studies, telling us which discrete physical areas of the brain are used in different cognitive tasks. On the other hand we have the ‘connectome’, a multi-site initiative to map the brain’s ‘network architecture’, revealing how cognition emerges from dynamic signaling processes. Guenther points out that these two impulses sit uneasily with one another: ‘When scientists trace the passage of a nervous signal across a brain circuit, it is very difficult to privilege any one part of the path and identify it as the “cerebral location” of a particular function’ (3). She then returns us to the moment in the late nineteenth century when the same fruitful tension played out in European psychiatry and neurology.

Each chapter is named for a site of neuropsychiatric practice: the morgue, the lecture theatre, the couch, the exercise hall, the hospital, the operating room. Laying her groundwork for what is to come, Guenther first takes the reader to the dissecting rooms of mid-nineteenth-century Vienna, where the dominant framework for medical research was pathological anatomy. Correlating symptoms in the living patient with internal lesions revealed at autopsy was the royal road to elucidating the causes of disease. This was, by definition, a localisation project, and in neurology it reached its apogee with Pierre Paul Broca’s 1861 identification of the area subserving the function of speech. Guenther shows how this idea of localisation of brain function was disrupted by the anatomist Theodor Meynert, who revolutionised the lesion paradigm in order better to account for diseases of the mind.

Meynert, Guenther explains, placed higher intellectual functions into the connectionist framework of the ‘Bell–Magendie Law’, a system of sensory input pathways and motor output pathways that supplied a physical basis for reflex behaviour. Debate swirled around this principle in the middle decades of the nineteenth century. Did it only characterise the automatic reflexes? Or could it be extended up the spinal cord to the brain? Various other physiologists had theorised how the sensory-motor system might include higher intellectual functions. Meynert’s contribution to this debate was to complicate the basic idea of a stimulus–response mechanism by adding in a third term: ‘association’.

The introspective ‘association psychology’ of previous generations had attempted to discern law-like regularities in the way that thoughts were linked together. Meynert drew

on this tradition to outline the way in which two sensory messages arriving simultaneously – for example through the eye and the ear – laid down associations that were then re-excited whenever just one of the elements reappeared. To use his favourite example, the sight and sound of a bleating lamb laid down association fibres connecting the visual image of a woolly quadruped with the auditory stimulus ‘baah’. Thereafter, just hearing the bleat would be sufficient to produce a visual image of a lamb in the mind.

The bridge from Meynert to the rest of the protagonists is a wonderful chapter on Meynert’s student Carl Wernicke. Wernicke was able to plant his name on the human neural map on the basis of just two observed cases of aphasia, which he theorised in terms of a dynamic network linking the sensory reception of heard language with the motor production of spoken words. Guenther then examines what happened to this model of brain function when Wernicke tried to apply it in the clinic. He would ask a patient a question, sending the inquiry into his or her brain ‘like a psychic sonar that could determine the seat of a lesion along the “mental reflex arc”’ (50). Wernicke conducted these interrogations of patients in a lecture hall in front of an audience. The exchanges would be recorded in transcripts that then became the objects of analysis. The complexity of the patients’ responses to the questions turned out to confound any neat physiological schema. As a result, Wernicke rejected the patho-anatomical approach in favour of a deep engagement with the language of these highly theatrical clinical performances, anticipating many of the developments in psychiatry in the century to follow.

In a series of dazzlingly concise case histories, Guenther then shows how variations on the Meynert–Wernicke model of the brain – sensory input, complex associations, motor output – informed the clinical practices of Carl Wernicke, Sigmund Freud, Otfried Foerster, Paul Schilder and Wilder Penfield. *Localization and its Discontents* shows how these practitioners’ divergent approaches to nervous system disorders – from talk therapy to neurosurgery – actually emerged from a common set of problems about the nature of the reflex arc and the possibilities of reflex therapy. The chapter on Freud was informed by Guenther’s discovery in the Library of Congress of a previously unknown manuscript by the father of psychoanalysis (73). Showing clearly how psychoanalysis emerged from Freud’s engagement with the problems of reflex therapy, it provides the reader with a richer sense of the shared scientific terrain than any previous account. By analytically uniting this cast of characters, Guenther has sharpened our understanding of the individual practitioners and deepened our sense of the context in which they worked. Along the way, the tensions, contradictions and potentials of contemporary neuroscience are supplied with a most illuminating prehistory.

**Cathy Gere**

Department of History,  
University of California, San Diego, USA

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**Cathy Hannabach**, *Blood Cultures: Medicine, Media, and Militarisms* (New York: Palgrave Macmillan, 2015), pp. viii, 153, \$67.50, hardback, ISBN: 978-1-137-58158-7.

Blood has long been considered to possess a dual nature. For one, blood is regarded as both a bodily material that sustains functions necessary for human life and an object with metaphorical meanings associated with the circulation of identities, relationships, life and death. By following the rhetoric of blood banking, in which blood becomes an