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Delia Gavrus and Stephen T. Casper, eds., *The History of the Brain and Mind Sciences: Technique, Technology, Therapy*. Rochester Studies in Medical History. Rochester, NY: University of Rochester Press, 2017. Pp. vii + 299, illus. USD\$125.00 (cloth). ISBN 978-1-58046-595-3.

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Moving home last year was an unpleasant experience, not least because of the need to transfer my books. That I have a lot, for study and distraction, was especially clear after I had packed them into so many cartons that I pondered whether the time had come to shrink my library. The not inconsiderable cost of transport was one problem, as was the space they would occupy in our new house. But losing access to them would also be painful. For example, my complete sets of the *Neurologisches Centralblatt* and the *Zentralblatt fuer die gesamte Neurologie und Psychiatrie*, 4½ shelf metres of pre-Medline chronicles purchased in Leipzig, have been invaluable portals to pre-1945 neurology and psychiatry, enabling me to indulge my passion for European neuroscience history despite being 16,000 kilometres from the focus of my research. Not restoring them to my shelves would be taking definitive leave from a source not only of information but of inspiration.

My conundrum was trivial, however, compared with the tragedy of scientists attempting to re-establish their personal and professional lives in exile after fleeing Germany during the 1930s. Yet I felt special empathy for *Nervenarzt*-philosopher Kurt Goldstein (1878–1965) when reading of his problems attempting to bring his library to America following his flight from Europe, as poignantly described by Frank W. Stahnisch in this volume. Customs officials were convinced Goldstein was defrauding his hosts of lawful taxes on commercial goods; why would an academic physician need so many books and films? (Australian customs officials exacted full taxes on my Leipzig books for the same reason.) Even the brightest intellects cannot easily transplant their activities to new soil without access to material objects that help them elaborate and test their ideas. For most émigré scientists, beginning again under different social and academic conditions (genuine continuity was rarely possible) was difficult enough without losing the few items they had managed to rescue in their luggage. For some, marginal factors had even more dire consequences: requests by respected neurologist Felix Stern (1884–1941) for assistance to emigrate from Germany, for instance, were repeatedly declined, primarily because his poor English was deemed a hindrance to integration. Stern committed suicide to avoid deportation to a concentration camp in 1942.

Scientists and academics see themselves as members of an international community that overcomes national and social boundaries in the pursuit of knowledge. Membership is nonetheless contingent on many factors and conditions that are often taken for granted or overlooked. These “marginal” elements are typically also passed over in silence by historians and other commentators. The contributors to this collection of essays seek to redress a few of these omissions, ranging from the incidental to the unjust. Should they achieved nothing else, these vignettes of neuroscience history highlight the fact that science is

as human an activity as any other, pursued by people who are neither entirely autonomous nor dispassionate, human beings limited in their capabilities and endurance, creatures of their time more or less dependent on the support and recognition of others. Like the Genoese explorer Christopher Columbus (1451–1506), no-one discovers new worlds alone. This is not to underplay the impact of the lead actors: without Columbus, his sailors would not have sailed west at all.

Editors Delia Gavrus and Stephen Casper define the collection as “a meditation on the role that technique, technology, and therapy . . . have played in the constitution of the mind and brain sciences over the past one and a half centuries” (1), aspects hitherto relatively unexplored by neuroscience historians. They approach this goal “through the lens of seemingly marginal stories — stories that appear, from a contemporary perspective, to be situated at the edges of history” (2). The nine contributions range from nineteenth-century Paris to the recent past; their thematic foci include laboratory assistants, scientific models, material and intellectual artefacts, bibliography, and social and political trends, which enabled or shaped scientific practice. Their styles also vary, including narrative, analytic, and sometimes polemic elements. These expeditions into past worlds, weekend digs rather than archaeological campaigns, allow the reader more time to breathe their air than would a broader perspective. Each tale exudes the charm of a short story, imbued with implications for the cultural mosaics of which they form part.

Stephen Jacyna discusses the menagerie in post-revolutionary France as a laboratory for studying animal behaviour under controlled conditions, with the dual aims of attracting visitors and facilitating comparisons of mental processes in man and beast. Realizing both aims depended as much upon the assiduous efforts of anonymous keepers as on trained naturalists. Apart from the reference to the unnecessarily mystifying concept of “truth machines” (26), this fascinating exploration of the seemingly marginal, the study of the animal mind for understanding the human, provides the ideal opening to a volume on the backroads of neuroscience history.

Delia Gavrus similarly concerns herself with people whose essential contributions to research are not always explicitly recognized: laboratory assistants and technicians. Her intriguing example is Edward Dockrill (1838–1927), sometime laboratory assistant to New York neurosurgeon Wilder Penfield (1891–1976) during the 1920s. Penfield was interested in the pathology of brain injury, even travelling to Spain to learn the most advanced methods for visualizing glia. Dockrill, without formal laboratory qualifications, refined their execution in Penfield’s laboratory, and was taken aback that his work was not recognized by authorship on Penfield’s publications — and recorded his disgruntlement in a semi-autobiographic novel that was never published. Dockrill was a likeable if somewhat scurrilous character, and his marginal role in Penfield’s pursuit of a mistaken model of epilepsy is a wonderful example of his own view that science “is very humanly warm and frail” (136).

Thomas Schlich explores the role of laboratory physiology in the development of modern surgery, moving from empiric and anatomic justifications to an experimental physiology evidence base, accompanied by a shift to viewing it as a purely scientific or even technical activity. Schlich criticizes the implied exclusion of political and social factors, but, as his account indicates, the acceptance of surgery, including neurosurgery, was chiefly advanced by its increased success and reduced mortality rates.

Max Stadler and Stephen Casper each analyse aspects of how the presentation of scientific concepts affects their development and reception. Stadler describes the transition from direct to alternating current models of nerve cell physiology, and how investigators relied on emerging physical concepts — that is, from outside the immediate realm of biological science — for modelling and delivering controlled electrical stimulation, resulting in a multi-layered metaphor for comparing nervous transmission with electrical circuits. Inevitable discrepancies between ideal circuits and nerve behaviour motivated ingenious modifications of biophysical concepts that did not protect against hyperbole, such as seeing the models as a “Rosetta stone [for] deciphering the closely guarded secrets close to the very borderland of mind and matter” (128) — not unlike more recent enthusiasts who believe human-like artificial intelligence is within

reach. Casper focuses on how science was explained to the lay public during the Festival of Britain in 1951, an attempt to restore public morale after the disappointingly vapid victory of 1945. The assiduous soliciting and organization of contributions on contemporary science from its leading authorities revived memories for me of the esteem in which science was held by the general public when I was a child (during the 1960s). Casper notes that neuroscience was not a major focus in 1951, although psychological techniques guided the exhibition of material so that it was both intelligible and inspiring for its primarily lay audience: somewhat ironic, in view of the overall reductionist bent of the exhibits.

The essay by Kenton Kroker reviews the use of bibliography and statistics between the World Wars to “make visible” encephalitis lethargica, the elusive neuropsychiatric disease that puzzled clinicians and public health officials alike, defying attempts to specify its cause and transmission. The major American publications on the strange disorder were not original research reports, but the co-operative volumes produced by the New York-based Matheson Commission of Investigation, essentially extensive lists of literature on the epidemiology and treatment of encephalitis. The League of Nations’ health organizations, precursors of the World Health Organization, were similarly limited to collating data from member nations, a frustrating contrast to their relative success in restricting the spread of infectious diseases into Europe during the dissolution of the Russian Empire. Kroker also discusses the relationship that was briefly suspected to exist between lethargica and encephalitis associated with smallpox vaccination in some countries, a potential catastrophe for health policy. His account reflects the impotence felt by American and international authorities at the time. A more detailed picture of the disease, I would argue, was achieved in continental Europe because fences between specialties, particularly neurology and psychiatry, were lower.

Justin Garson’s interpretation of “amphetamine psychosis” as a model of schizophrenia during the 1960s and 1970s is more contentious. Two features of scientific practice often marginalized by philosophers of science are that most participants are not driven by hidden agendas, but actually believe in what they do; and that models and paradigms rise and fall according to their real-world usefulness. That lysergic acid diethylamide (LSD) was supplanted by amphetamine in 1960s models of psychosis had more to do with recognition of the weaknesses of the hallucinogenic version than with biases in the psychiatric or pharmacological communities. The dopamine hypothesis of schizophrenia, in turn, was found to not account for the entire psycho-neurophysiologic complex that is psychosis; nevertheless, its history cannot be reduced to a conspiracy motivated by a need to demonize “speed freaks.” Garson’s exploration of the social setting for discussions of the nature of idiopathic and model psychoses during the 1960s is impressive, but to elevate their significance relative to prosaic scientific reasons in determining the preferred model, which can hardly be ascribed “almost entirely [to] Snyder’s creative imagination and a handful of notes feverishly scribbled by speed freaks” (220), is adventurous.

The language of Brian Casey’s account of the role of the United States National Institute of Mental Health (NIMH) in the return to biological psychiatry during the 1970s is more restrained, although he also employs “reductionism” as a disparaging synonym for an “attractively simple mechanical explanations of complex mental and behavioral phenomena” (230). The chapter is a generally fair depiction of the early period of the new biological psychiatry, buoyed, like the early stages of the microbiologic era in infectious diseases, by sometimes exaggerated hopes for the elimination of disease, before limitations and adverse consequences became more manifest. Casey appears surprised that the NIMH supported in its public pronouncements the direction pursued by its own people. That practical successes could possibly be the primary motors of a concept is downplayed in the otherwise justified emphasis on the role of research funding in determining scientific pathways.

Katja Guenther closes the volume by arguing that factors considered marginal may, in retrospect, prove to have been crucial, so that “historicizing the marginal . . . makes us better historians” (258). Technique is certainly central to the neurosciences: history and progress have largely been guided, for better or worse,

by the emergence and modification of methods and technologies, in symbiosis with the research questions that motivated them and were motivated by them. But Guenther too suggests that scientific practice is primarily driven by lower motives: surgeons “legitimated” their procedures by reference to physiology, the NIMH used “scientific rhetoric” to establish biological psychiatry as the dominant “biomedical paradigm,” medical scientists made “schizophrenia more real” through “symptom reconceptualization” in order to “integrate the disease into the biomedical paradigm” (261); we learn that NIMH scientists “knew” that antidepressant drugs were essentially placebos (262), and that “we need historical analysis to ‘undo’ the move from a psychodynamic to a biological paradigm within psychiatry” (263). This one-sided view implies that we should understand the function of science history as being the exposure of charlatany rather than critically assessing — *sine ira et studio!* — the processes by which human beings seeking informed responses to complex questions develop their concepts, test them in the real world, and correct them as necessary. The star of biological psychiatry rose not because of politics but because it provided solutions — not least: relief for patients — that psychoanalysis could not (as documented in Casey’s essay). The social and personal side-effects that attend “reductionist” solutions can be debated, but that is a different discussion.

Investigators can cling to cherished models beyond their period of usefulness, and, as German physicist Max Planck (1858–1947) observed, some paradigms cling to life until their proponents have all died. Scientists are as capable of error as anybody — possibly more so, as they ideally operate on the frontiers of human knowledge — but to marginalize their essential belief in their own methods and findings is wrong. I might question the potential of brain imaging to reveal specific cognitive content, but have no doubt that proponents of the idea are sincere in their aspirations. Nor are scientists or clinicians unmoved by prevailing social, political, and personal circumstances. Nevertheless, the major currents of scientific thought are stirred not by thrusts toward power or prestige, but by confidence in one’s direction. “Alternative facts” are of only ephemeral value in science, and a discrepancy between claim and reality is more often a mistake than evidence of dissemblance.

Like all good scientists and other thinkers, I enjoy a robust discussion, and this collection of essays has enthralled and entertained, moved and irritated me; most importantly, it has stimulated and challenged me. The micro-histories (or, as I prefer, historical cameos) offered in these pages without exception vividly convey a sense of events and of the times and situations in which they transpired. This book is recommended to all historians and other readers interested in experiencing the usually overlooked colours and smells of strange worlds we sometimes imagine we know, and which are the bases of our own.