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***Psychiatry and Clinical Neuroscience: A Primer.* By Zorumski and Rubin. (Pp. 336; £40.00; ISBN 9780199768769 hb.) Oxford University Press: Oxford, UK. 2011.**

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Book review

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Psychiatry and Clinical Neuroscience: A Primer. By C. F. Zorumski and E. H. Rubin. (Pp. 336; £40.00; ISBN 9780199768769 hb.) Oxford University Press: Oxford, UK. 2011.

Network characterization of real-life systems is the latest influential paradigm to emerge in the natural and social sciences (Barabási, 2012). In the neurosciences this paradigm has manifested itself in efforts to map a detailed structural network organization of the human brain, and to describe brain function and dysfunction emergent on this structural substrate. Network characterizations of the brain have been enthusiastically adopted by many clinical neuroscientists, with a notable push by the US National Institute of Mental Health towards a new classification of psychiatric disorders based on abnormalities of brain networks (Insel *et al.* 2010). At the same time resistance to scientific psychiatry persists amongst a segment of psychiatric clinicians, reflecting broader ongoing tensions over the role of neuroscience in clinical practice (Tyrer, 2009).

Charles Zorumski and Eugene Rubin, psychiatrists and neuroscientists at the Washington University in St Louis, firmly place themselves on the side of scientific psychiatry in their latest book *Psychiatry and Clinical Neuroscience*. The book is primarily intended for medical students and residents, although some of its themes broadly overlap with the authors' previous general-audience title 'Demystifying Psychiatry'. The present book hence attempts to demystify psychiatry by describing psychiatric clinical practice, and by outlining the neuropathological underpinnings of major psychiatric disorders. The result is a cogent and comprehensive overview of the field, a broad sweep through a wide range of topics relevant to psychiatric practice and research – from clinical examination, diagnosis and treatment, to advances in functional neuroimaging, genetics and molecular research. This *smörgåsbord* of topics makes the book a valuable reference for medical students and residents wishing to learn more about the state of the art of psychiatry.

Throughout the book, the authors repeatedly emphasize the medical model of psychiatry in general, and the network-neuroscience model in particular. One hopes, however, that the emphasis on the medical model here is unnecessary, as the intended audience

should be sufficiently comfortable with this model. The authors do lament that many clinical psychiatrists still treat the brain as a black box, but this treatment is arguably driven by the relative unimportance of neuroscientific research for current psychiatric practice, rather than by an ignorance of the medical model *per se*.

Network neuroscience on the other hand is only starting to enter mainstream psychiatry, and its exposition here is very welcome. This exposition primarily focuses on intrinsic connectivity networks, patterns of correlations between brain regions thought to represent functional processing systems. The authors describe plausible ways by which psychiatric disorders could in the future be understood as disturbances of these brain networks. In their own words, '[p]sychiatry is at a critical time in its history and is poised for major advances. [...] From our vantage point, it is increasingly clear that psychiatric disorders are problems of distributed and interactive brain networks.'

The shift away from umbrella-phenotype descriptions of the DSM and ICD, and towards specific network-based characterizations of psychiatric disorders would certainly be appealing. Yet progress in scientific psychiatry has been frustratingly slow in the past, and throughout the book I longed to get a glimpse of the relationship between current touted-as-revolutionary developments and past triumphs and failures of psychiatric research. The network-neuroscience model of psychiatric disorders is indeed intuitive, and has a long history dating back to Meynert and Wernicke in the nineteenth century. Yet the sceptically inclined may also notice that the recent resurgence of this model coincided with the simultaneous rise of the network paradigm in many unrelated scientific fields. Perhaps psychiatry was already at this point before, poised for revolutionary advances, only to have fallen short; this at least appears to be the story of the chemical-imbalance models of psychiatric disorders. The authors largely dismiss these models as archaic oversimplifications, but it may have been more instructive to describe where these models succeeded, where they failed, and how they could be incorporated into future frameworks, rather than be simply dismissed (one potential framework could for instance include neurotransmitter imbalances as links in a causal chain of network dysconnectivity).

Network models are themselves not without limitations, and one important question is the accuracy with which these models represent the ground truth

of brain-network organization. As an example, several network concepts described in the book, including the small-world-network property (a network organization simultaneously conducive to functional segregation and integration) are not informative of functional processing in the small and dense intrinsic connectivity networks. These same network concepts may however become much more relevant in larger and sparser maps of causal regional interactions. The field in general would benefit by thinking more about such potential roadblocks, if only to avoid repeating past disappointments.

Caution aside, the field would also benefit by filling its ranks with bright clinician scientists, and here the authors' enthusiasm for network neuroscience, their impatience with outdated modes of psychiatric practice, and their excitement for the future of psychiatry come into their own. The enthusiasm is especially palpable throughout the book and one hopes it will

prove infectious for the intended audience. Indeed should the book be successful in luring future clinician-scientists into the profession, it would have undoubtedly achieved some of its most important aims.

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