Book Review

DYNAMIC COORDINATION IN THE BRAIN: FROM NEURONS TO MIND

Edited by Christopher von der Malsburg, William A. Phillips, and Wolf Singer, 352 pp., MIT Press, 2010, \$40.00

The dynamics of neuronal circuits are far from a theoretical construct without applicability to normal behavior and disease states. For example, the oscillatory activity of neuronal populations is well known to neurologists because they occur in various stages of sleep as well as aberrantly in epilepsy. A group of prominent scientists in the field gathered in Germany in 2009 to discuss the blossoming, yet historically rich, field of dynamic coordination in the brain. The resulting volume, *Dynamic Coordination in the Brain: From Neurons to Mind*, is a compendium of historical review, current thinking, and hypotheses for future work regarding this topic.

The 18 chapters offer the perspective of each participant on the central hypothesis that neuronal dynamics are important for behavior. The wide range of expertise presents the reader justifications and potential mechanisms for this phenomenon from the point of view of psychology, behavior, cellular physiology, and computational neuroscience. Both experimental animal and human data from the literature are covered, and specific brain regions include hippocampus and neocortex, especially visual and prefrontal cortex. Disease states mentioned, specifically in chapter 17, are amblyopia, schizophrenia, Williams syndrome, autism, epilepsy, and Alzheimer disease.

The potential target audience of this volume is probably the neurologist and non-neurologist involved in research at the behavioral or physiologic level. A few chapters require a background in psychology, whereas most others are more appreciated with an understanding of neurophysiology at the cellular and population level. Nevertheless, the level of detail is appropriate. For example, prior research is very well cited and therefore extremely useful to those wishing to delve deeper into the original literature. Figures and illustrations are few and far between, but those included are relevant and clear. The organization of the chapters may have benefited from an order advancing from single neuron properties to whole organism behavior. However, because some chapters span this range individually, this may have been difficult.

Dynamic Coordination in the Brain: From Neurons to Mind is certainly dense, yet thorough and expansive enough to engage the research-minded and thought provoking enough to be relevant for several years to come. Further, because much of the research cited is relatively new, it is of some novelty in comparison to other neurophysiology research books. Certainly, as clinical neurology and basic neuroscience become more intertwined, volumes such as this will become all the more vital to generate discussion and hypotheses that are clinically relevant.

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Disclosure: The author reports no disclosures.

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Neurology 2011;77:e74

DOI 10.1212/WNL.0b013e31823020c1

This information is current as of September 26, 2011

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