Review: [Untitled]

Reviewed Work(s):
> *A Neurocomputational Perspective: The Nature of Mind and the Structure of Science.* by Paul
> M. Churchland

Lynne Rudder Baker

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A NEUROCOMPUTATIONAL PERSPECTIVE: THE NATURE OF MIND AND THE STRUCTURE OF SCIENCE. By PAUL M. CHURCHLAND. Cambridge, MIT Press, Bradford Books, 1989. Pp. xvii, 321.

This book is a collection of fourteen essays written during the 1980s. Although versions of all but three have been published elsewhere, their joint publication is useful since they add up to a novel and unified approach to the mind and science. A sample of titles suggests the range: "Folk Psychology and the Explanation of Behavior," "Some Reductive Strategies in Cognitive Neurobiology," "On the Nature of Theories: A Neurocomputational Perspective," and "Moral Facts and Moral Knowledge."

The central theme is that philosophy of science and philosophy of mind are now interwoven: no longer can either be pursued in isolation from the other. The fusion of these fields is assured, Churchland maintains, by the development of a new cognitive paradigm, rooted in neuroscience. The new paradigm is based on connectionist (or network or PDP) models in AI and is offered as a genuine alternative to "the sentential paradigm of folk psychology" (xiv). What is distinctive about the connectionist approach is that it postulates high-dimensional "activation-vectors," rather than sentence-like entities, as the basic elements of cognition and vector-to-vector transformations as the principal form of computation (127). The semitechnical introduction to connectionist neuroscience serves as grist for philosophical speculation. The question is whether to appeal to connectionism contributes to understanding philosophical issues. Does it ultimately illuminate or obscure?

Churchland finds connectionism philosophically significant in two ways: (1) Connectionism is said potentially to disconfirm and to replace commonsense attributions of belief, desire, intention, and so on, which are said to constitute a would-be theory dubbed "folk psychology" or "FP." (2) Connectionism is said to yield a new account of explanations, theories, paradigms, conceptual change, and other phenomena in the domain of the philosophy of science. Space permits only brief comment.

(1) Connectionism is a potential replacement for FP only if connectionism can do better what FP does less well. Where is FP faulty? According to Churchland, FP is a failed research program, one that has made little progress over the last couple of millenia. It is charged with failure to explain the nature of mental illness, the function of sleep, or the faculty of creative imagination (7). Now, if common sense were a research program aimed at explaining internal mechanisms, then even its diehard defenders would have to admit it to be a failure. But it is simply a mistake to assume that commonsense attributions, with us at least since Homer, aim to de-

scribe internal mechanisms in the first place. On the one hand, if 'FP' refers to a particular research program (for example, classical AI) in competition with connectionism, then FP is not the commonsense psychology learned at mother's knee, and the failure of FP in this sense would not put commonsense attributions of attitudes at risk. On the other hand, if 'FP' refers to our ordinary practices of attributions of attitudes, then connectionism no more threatens FP than quantum mechanics threatens our commonsense understanding of traffic jams.

(2) Churchland's use of connectionism to solve problems in the philosophy of science rests on a conflation of views on the nature of knowledge and views on the mechanisms that encode it. For example, Churchland's diagnosis of the failings of the D-N model of explanation "locates the basic problem in its attempt to represent knowledge and understanding by sets of sentences or propositional attitudes. In this, the framers of the D-N model were resting on the basic assumptions of folk psychology" (121).

To impute to the framers of the D-N model assumptions of folk psychology is either to mistake the character of that model, which is explicitly logical, or to take deductive inference itself to depend on folk psychology. (If the latter, FP would be as "safe" as deductive logic from neuroscientific discoveries.) Connectionism, if true, may falsify sentences-in-the-brain models of internal mechanisms, but all that would follow is that propositions and propositional attitudes should not be understood in terms of sentences-in-the-brain. Throughout, the (plausible) claim that if connectionism is true, then sentences-in-the-brain models are false is elided with the distinct (and implausible) claim that if connectionism is true, then knowledge is nonpropositional.

Churchland speaks as if he is offering a new and nonpropositional account of representation in terms of spiking frequencies, laminar patterns in the brain, and so on, and as if this new account of representation sheds light on the nature of theories. But, once again, there is a mismatch between question and answer—in at least two says. (i) Even if, as he argues, representations are "vectorial" rather than "propositional," Churchland offers no naturalistic account of what makes a given activation vector represent a particular environmental feature. So, although Churchland makes free use of the term 'representation' (in many different ways), he is not offering an account of representation in the sense that has exercised philosophers recently.

(ii) In treating topics in the philosophy of science, Churchland offers psychological answers to nonpsychological questions. For example, he suggests that "we might unify and illuminate all of these notions [of theory, paradigm, pattern of argument] by thinking in terms of the evolving structure of a hidden-unit activation-vector space, and its development in the direction of representing all input vectors somewhere within a single

similarity space" (194). Putting aside the worry that Churchland gives us no idea of what makes a configuration of connection weights represent one thing rather than another, the suggestion appears to confuse what is thought about (here, theories) with neural mechanisms that enable us to think about them.

Churchland's enthusiasm for connectionist answers to philosophical questions puts me in mind of someone who takes all important questions about the nature of painting to be questions about the chemistry of paint. One may agree that chemistry sheds light on this or that question about painting, without taking it to replace traditional art history *in toto*. So, too, one may agree that connectionism is an exciting development in psychology, without taking it as a potential replacement of commonsense attributions. A scientific theory just does not wear its philosophical heart on its sleeve.[1]

<div align="right">LYNNE RUDDER BAKER</div>

University of Massachusetts at Amherst
Middlebury College

THE METAPHYSICS OF MIND. By MICHAEL TYE. New York, Cambridge University Press, 1989. Pp. vii, 215.

There's a venerable philosophical tradition of advertising the most shocking metaphysical theses as nothing more than the proper analyses of our ordinary ways of speaking. Just as Berkeley wanted to show us that we didn't really believe in material objects, Michael Tye wants to convince us that we don't really believe in *events*. Although *The Metaphysics of Mind* focuses on mental events, their case serves mainly as a stimulus for the rejection of events in general. And the elimination of events is, in turn, but one necessary step in the development of Tye's thoroughgoing nominalism, one that countenances nothing but concrete physical particulars and sets of such.

The argument against events is given in the first chapter (coauthored with Terence Horgan). It goes like this. Causal claims are interest-relative: sometimes we cite triggering events, sometimes background conditions. Because of this interest-relativity, and because of the different sets of interests underlying folk psychology and neurobiology, it is highly unlikely that there is a uniquely best mapping of "physical causal isomorphs" onto