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ELIZABETH A. WILSON, *Neural Geographies: feminism and the microstructure of cognition*. New York and London: Routledge 1998. Pp. viii + 226. (cloth: ISBN 0-415-91599-6);(paper: ISBN 0-415-91600-3).

Writing within and against the set critical practices of psychoanalytic-deconstructive-Foucauldian-feminist cultural theory, Elizabeth Wilson demonstrates, in this provocative and original book, the productivity and the pleasure of direct, complicitous engagement with the contemporary cognitive sciences. Wilson forges an eclectic method in reaction to the 'zealous but disavowed moralism' of those high cultural Theorists whose 'disciplining compulsion' concocts a monolithic picture of science in order to keep their 'sanitizing critical practice' untainted by its sinister reductionism. Her unsettling accounts of texts by, for example, Karl Popper, Judith Butler, Derrida, Turing, Ebbinghaus and Freud will send many readers back to the sources. It is no surprise that such a broad and ambitious project leaves many threads loose, and no criticism at all that it succeeds more in hinting at the promise of a new connectionist politics than in offering up such a hybrid fully-formed.

In a clear, polemical introduction Wilson sketches her orientation on four central theoretical sources: critical theory, connectionism, feminist approaches to embodiment, and Derrida's accounts of how to 'inflare' binary distinctions. Then in Chapter One, on feminist psychology, Wilson argues for the utility of deferring 'questions about women', and instead seeking sexual specificity in apparently neutral domains like perception, the brain, or memory and learning. The second chapter makes the case that psychology is enabled, not damaged, by its ongoing 'crisis' of scientificity: ignoring boring demarcation disputes about genuine and pseudo-science, a productive critical psychology will play a double game, indulging in data-driven empiricism and interpretive metaphysics at once. Chapters three, four, and five then form a continuous argument, in which Wilson moves from a general interrogation of both computational and neurobiological psychology to a specific dovetailing of concerns from classical psychoanalysis, connectionism, and deconstruction.

In juxtaposing the 'psychoneurology' of Freud's *Project for a Scientific Psychology* with deconstruction and with cognitive science, Wilson uses, as a core test case, the concept of a memory trace: 'if it is through Derrida and Freud that we can formulate a cognitive trace that is not a present, fixed, and locatable psychical entity, then it is in connectionism that we see an instantiation of these principles in a manner that is coherent to scientific psychology' (189). The memory trace is material, but 'ungraspable' and 'unlocatable': I'll try to explain 'this resistance of the trace to empirical ambitions' (149) with a detour back through connectionist theory, by invoking a helpful distinction (ignored by Wilson) between 'explicit' and 'implicit' representation.

In a connectionist, anti-logicist picture of mind and memory, remembering is the reconstruction of a pattern of activation across many elements in a (natural or artificial) neural network. The 'representations' involved in occurrent remembering are not atomic items separately stored at fixed addresses in some memory palace, but fleeting activation vectors. No explicit memory representations, then, are continually present over time between past experience and current remembering. The word 'trace', in this context, is systematically ambiguous: it can refer to this transient pattern of activation, of which there can be only one at a time in one network, or it can refer to the (many) enduring dispositions in the network which ground its capacities to reconstruct those various transient patterns. These dispositions, built up in learning, are (not activation patterns but) changes in the set of weights on all connections between elements, such that appropriate patterns will arise in particular contexts. When I actually, occurrently remember my phone number (now), there is an explicit representation; when I am not currently remembering it, I still (dispositionally) 'remember' it, thanks (says the connectionist) to my implicit representation.

But now there is an immediate metaphysical problem about these implicit traces. According to the key postulate of 'superpositional' storage which structures this account, every trace in a network is 'encoded' in the same single, global set of connection weights. How then can we individuate particular implicit representations? Superpositional holism in storage leads to the much-vaunted human-like patterns of blending, interference, and error in connectionist networks: but it also entails that, in a sense, there are no separate (implicit) traces enduring over time. (As Locke put it, 'our Ideas are said to be in our Memories, when indeed, they are actually no where'). If there are many 'representings', argues Tim van Gelder, they are in one representation: and the severely potential character of implicit traces leads some connectionists, such as William Ramsey, to claim that they are not representations at all.

Wilson rightly rejects the 'microfeatural' response to this problem (by which single elements do stand directly for smaller bits of the world), because it retains the troublesome, passive atomism of traditional localism (192-4). However, she confuses (deliberately but in my view unhelpfully) this defence of true superposition over local representation with a rejection of the global localization of cognitive functions. The latter kind of localization, by which olfactory perception and numerical reasoning, say, are claimed to be mainly subserved by different parts of the brain, concerns the distinctness and separability of functions, not of representations. Non-local superposition, with its lovely cognitive properties, might be the mode of representation within large-scale functional modules: while connectionists may be legitimately suspicious of some functional modularity claims, especially as increasingly invoked by evolutionary psychologists, Wilson needs a more direct critique of neuropsychological double-dissociation studies to justify her scepticism.

Without microfeatural subsymbols, then, connectionists are left with what Wilson calls 'the systematic and lawful play of nonpresent neurocognitive differences' (163). Because all occurrent remembering must thus be reconstruction, not reproduction, there's no obvious source of sameness in memory, no clear possibility even of thinking the same thought twice. Wilson perhaps underestimates the extent to which mainstream cognitive psychologists have been grappling with this bewildering possibility for ten years or more: her tendency to privilege the computational and neuroscientific over the experimental and statistical strands of scientific psychology leads her to neglect an increasing body of ecologically-driven experiment on distortion, source monitoring, and misinformation effects in cognitive research on autobiographical memory. The anti-atomistic message of Bartlett's wonderful *Remembering* (1932) is perhaps no longer so often 'betrayed' (175).

But since Wilson is refreshingly unconcerned about the threat to realism and to truth in memory which reconstructive models pose, her targets lie elsewhere. Seeking to build malleability in from below, she mounts equally powerful cases against feminists who construct the biological body as rigid and stable in order to show how culture and society infiltrate it from the 'outside', and against psychologists who locate cognition only in the brain, abandoning the rest of the body 'to brute, noncognitive mechanization' (59, 124). Here my whinges are pedantic. Perhaps this history is too conventional in blaming Descartes for endowing us with 'the untheorized body, the mechanical, tangible, artless body' (15): and perhaps Wilson neglects recent, post-connectionist cognitive science, in which dynamicists describe 'continuous reciprocal causation' between body, brain, and world, and cognitive anthropologists see distributed representation as a more flexible mechanism than the abstract 'habitus' for internalizing cultural norms. But she definitely succeeds in the perverse proliferation of surprising perspectives, avoiding the fatigue and paralysis of debates on whether to censor or applaud 'cognitive science' as a whole, in favour of a marvellously polymorphous disruption of problems about memory, body, and science.

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