

Correspondence

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Psychobiosocial muddle or model?

It is surprising to read that there is only a ‘rather subtle’ difference¹ between the approach to mind and brain adopted by MacKay and Jeeves and Alan Torrance’s adaptation of Cartwright’s pluralism, which has features in common with my own neutrally monistic ‘systems pluralism’. This impression fails to distinguish the scientifically trivial descriptions of brain and mind (‘dual aspects’) used to expound the ‘compatibilist’ view from the technically sound explanations of what is going on in people’s lives on which the holistic multiple systems view relies. The empirical vagueness of the dual-aspect account makes that approach liable to succumb to the unscientifically materialist ontology of atoms and physical objects that pervades our culture. I hope that a brief exposition of what scientists actually do explain in their different fields will take forward the discussion of the mechanisms of human choice in the articles in October 2004 and earlier issues.

One aspect of a person can indeed be *described* as her or his brain being most active in some specified regions, while another aspect at the same time is *describable* as the mind being occupied with a particular task. Yet, even if people generally show this specific concurrence, such statements say nothing about the known workings of the brain or of the mind.

In contrast, a scientific *explanation* of what is going on in the brain is couched in neurophysiological terms – namely, specified sets of nerve cells affecting each other and the body’s organs in systematically understood ways, and being influenced by the senses as evidenced in the primary research literature. *Explaining* scientifically what goes on in the mind is no less technical: the conscious and unconscious cognitive/affective/conative processes that interact in performing the task are specified in terms of current empirical theory within psychology, built upon one and a half centuries of experiments and systematic observations on the ordinary achievements of human and animal individuals.

That is, false-colour images of the brain do not advance neuroscience. Some parallels with particular sorts of mental activity take us no further in understanding a person’s mind or brain, let alone how they depend on each other. Such stories also detract from the truth that each of us is a unity of not just a mind and a brain but also a body and its physical environment, and a life in community too, involving language, economics, politics and other irreducibly

1 Clarke, P. ‘God, science and freedom: where next?’ *Science & Christian Belief* (2004) 16, 98–100, referring to Alan Torrance’s citation of Nancy Cartwright’s *The Dappled World*, CUP (1999).

social processes. In other words, a person is (at least) three distinct sorts of autonomous causal networks (systems). Mental events 'work' on each other: listen to a psychologist accounting for theory-testing evidence on what individuals do. Neuronal events influence each other: let a neurophysiologist explain. The effects of cultural events are on other cultural events: ask a historian, economist or political scientist how stuff happens.

Failure to understand how cognitive, neural and social explanations each work leads to notions that one of these sorts of cause can produce another of the sorts of effect, or that the evidence-based explanatory theory can be reduced or translated from one of these three sorts to another, or even to basic physics. Scientific advance made nonsense long ago of the conceptual apparatus still used by philosophers (and even some scientists) to create forks between dualist interactions and physicalist epiphenomena, mind-brain identity etc. What right have those without current publications in both scientific psychology and cellular neurophysiology (and within cultural studies too, to justify a fully critical realism) to demand that mind interacts causally with brain in any sense of causation like that used in either of these sciences of the mind and of the brain?²

Thus an empirically viable understanding of the relationships among mind, body and society must be inclusive of the distinct sciences in technical detail. This precludes any form of translation from one 'aspect' to another, let alone reduction, emergence, supervenience or quasi-causal interaction between the different sorts of system that exist within the one created reality of a human being. The best candidate for this superordinate type of explanation seems to be ontogenic psychobiosocial science — evidence-based theory of the maturation of a person's mind, body and social life in coordination.³ This integrated science of individual development will explain how successive molecular expressions of the genes and interpersonal impacts from the culture give rise to an autonomous agent and experiencer. A developmental psychologist can be as amazed as any parent to see the infant's mind growing as it is nurtured by its bodily and social inheritances; yet nothing mysterious is going on, beyond psychological investigation and research into those mental achievements' neural and social origins by specialists in those areas. Progress also towards machine intelligence arguably requires a similarly ontogenic science that includes experimentally based theoretical understanding of the mental

² Booth, D. 'Response to John Hick on Mind, Brain and Freewill', *Science & Religion Forum: Conference* (2003), script of oral presentation available from D.A.Booth@Bham.ac.UK

³ Two expert starts in this direction are by Karmiloff-Smith, A., Scerif, G., & Thomas, M. 'Different approaches to relating genotype to phenotype in developmental disorders', *Developmental Psychobiology* (2002) 40, 311-322, and Tomasello, M., Carpenter, M., Call, J., Behne, T., & Moll, H. 'Understanding and sharing intentions: the origins of cultural cognition', *Behavioral & Brain Sciences*, in press. Ian Barbour in *Nature, Human Nature and God*, Fortress (2002), takes a similar view of the theory of ontogenesis having the potential to integrate across the causal systems explained by the different sciences.

processes of the robots in each line of engineering development, as well as of their social functions and their hardware and software.⁴

The notion that the psychology and the neuroscience of a human being are merely two ways of talking about that person relies on materialism – if not explicitly then covertly, as a ‘non-reductive’ reduction of all science to nothing but physics. Neutrally monistic systems shatter the illusion shared by dualists and physicalists alike, that a mind could somehow go its own way separate from a brain, for dualists into immortality and for physicalists into epiphenomenal nonentity. The view that ‘neuroscientists are now studying all of the human faculties once attributed to the soul’⁵ is unsustainable in the face of a single current paper from a journal of purely psychological science.

It is equally false historically to claim ‘ever tightening links between mind and brain’.⁶ Basic scientific understanding of the interdependence of neural processes and mental processes was established a century ago. The key evidence was nothing as crude as phrenology or the results for Phineas Gage of the iron bar through his head: accidents to hands, eyes or genitals can also have devastating effects on basic personal functions. The crucial observations were the exquisite structures of innumerable fibres demonstrated in brain tissue by Cajal and others. The resulting view of the brain as an unimaginably complex ‘telephone exchange’ over which mind ‘conversed’ was irrefutably established fifty years ago by electronic microscopy of synapses on the dendritic tree of a nerve cell and electrical recordings of the axon from one of these cells, coupled with advances in understanding of the information-processing power of such machinery gained by running code on myriads of switches that we ourselves had engineered. Far from psychology being absorbed into neuroscience, leading workers are discovering how different the mind is from the brain and how hard it is to create a technically sound explanation of how the natural machinery inside the human head helps to implement the mental and social tasks that people carry out each day.

Finally, this failure to recognise the disparity of neural processes and mental processes, despite the interdependence of mind and brain (and culture), has vitiated much of the discussion of the scientifically investigable mechanisms that are necessary to human responsibility. The scientific basics are ignored by the classic philosophical fork between determinism and free will.⁷ Misunderstanding of the nature of explanation in psychological science leads to misguided attempts to reconcile physical determinacy (‘clockwork’) with an indeterminacy of human choice. The scientific issues about personal responsibility

4 Booth, D.A. ‘Scientific requirements for an engineered model of consciousness’, submitted for publication, MS available from D.A.Booth@Bham.ac.UK

5 Murphy, N. ‘The problem of mental causation: how does reason get its grip on the brain?’ *Science & Christian Belief* (2002) 14(2), 143-157. Her footnote 4 contrasts with the rest of the paper in appearing to support a neutral monist understanding of ‘mental and physical descriptions’ [sic].

6 Jeeves, M. ‘Changing portraits of human nature’, *Science & Christian Belief* (2002) 14(1), 3-32.

7 Booth, D. A. *op. cit.* (2)

for actions centre rather on psychological determinacy, which was in fact the basis of MacKay's famous argument. John Byl⁸ and Patrick Richmond⁹ have pointed to more realistic ways forward.

The rationale for an act opens that intention, the effects of the action and the agent herself or himself logically to sound approval or disapproval. Psychological explanation of the workings of a human mind includes the causal processes involved in acting for one's own reasons. Neither brain science nor social science can help or hinder purely psychological science in its task of identifying these mechanisms of morality. The cultural origins of an individual's reasons and the history of ethical critique are matters for research into societal processes; nevertheless theories about the social processes can be vitiated by unrealistic psychology. Studies of the neural bases of responsible action similarly must be designed and interpreted in accord with scientific knowledge about the workings of the mind.

Yet sadly even psychologists can make the mistake of supposing that the detection of preparative neural activity before awareness of a decision shows that the person was not in control.¹⁰ Nobody suggests that a person does not have a memory or a percept because activity in the brain occurs before consciously remembering or seeing something; why is an intention any different? Much cognitive processing is unconscious: its effects on performance are measured indirectly, for example as implicit in some achievement that may be conscious. Action without forethought is not thereby any less intentional: my reasons are implicit in my act; if I know myself well enough, I can make them explicit in retrospect.

It is most unfortunate that arbitrary twitches of the wrist have been put forward as models of 'conscious choice': when no reasoning is applicable, then there can be no intention to be evaluated. In any case, ethically serious problems can usually be anticipated and, even when they cannot, there is often a moment to think before acting. Not finding activity in the brain during this deliberation before the solution came to awareness would merely mean that the neuroscientists had not done their job properly!

To sum up, there is literally no room in psychological science or in the brain sciences for 'top-down' or 'bottom-up' causation. The mind does not emerge from or supervene on physical causation either. The deterministic reasoning agent (that is, you and me) develops from increasingly autonomous interactions between genetic expression and cultural induction.

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8 Byl, J. 'Indeterminacy, divine action and human freedom', *Science & Christian Belief* (2003) 15(2), 101-116.

9 Richmond, P. 'Neuroscientific determinism and the problem of evil', *Science & Christian Belief* (2004) 16(2), 139-156. Richmond quotes Swinburne's lucid debunking of indeterministic views of reasons for action.

10 Jarrett, C. 'Changing programmes', *The Psychologist* (2004) 17, 622.

PETER G. H. CLARKE

MacKay/Jeeves and Torrance/Cartwright: Similarities and a Major Difference

David Booth's first sentence refers to my Editorial that introduced a series of articles on the theme of neuroscientific determinism and human freedom. Within this context, the approaches of Donald MacKay and Malcolm Jeeves do still seem to me quite close to Alan Torrance's adaptation of Nancy Cartwright's *pluralism*, and Torrance explicitly expresses agreement with Jeeves on top-down effects.¹ The writings of MacKay, Jeeves and Torrance all plead for the freedom of human beings as integrated spiritual, social, psychological, biological and physical entities. All agree on the autonomy of higher level accounts (e.g. psychological) with respect to lower level (e.g. neurobiological or physical) ones. All argue that emergent processes have genuine causal powers. And all reject ontological reductionism.

But if we go back to the writings of Cartwright herself, there is a major difference from MacKay and Jeeves, and it concerns the latter question of reduction. Cartwright's works say little about neurobiology or the mind, apart from a brief book chapter on the ideas of Roger Penrose,² but she has written extensively against physical reductionism. Whereas most philosophers and scientists (including MacKay and Jeeves) accept that if two situations are identical with respect to their physical properties they must be identical with respect to their biological ones, Cartwright does not. She finds this view problematic because it makes physics fundamental and all the other sciences 'special', denying their independent status.³ The revolutionary essence of her *pluralism* is that it denies this fundamental status of physics, as she argues in her difficult and controversial book *The Dappled World*;⁴ for an in-depth criticism of it see Anderson.⁵

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1 Torrance, A. 'Developments in neuroscience and human freedom: some theological and philosophical questions', *Science & Christian Belief* (2004) 16(2), 123-137.

2 Cartwright, N. 'Why physics', in Penrose, R., Shimony, A., Cartwright, N. & Hawking, S. (eds.) *The Large, the Small and the Human Mind*, Cambridge: Cambridge University Press (1997).

3 Cartwright, N. *op. cit.* (2) and *The Dappled World* (see 4 below).

4 Cartwright, N. *The Dappled World: Essays on the Perimeter of Science*, Cambridge: Cambridge University Press (1999).

5 Anderson, P.W. 'Science: A 'Dappled World' or a 'Seamless Web'?' *Studies Hist. and Phil. Sci. Part B* (2001) 32(3), 487-494.