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Resonance and Dissonance – A Response to Malcolm Jeeves

Psychologising or neurologising about religion is a cross-disciplinary integrative enterprise. When doing this form of scholarly work, it is helpful to have a fruitful image of what one is trying to accomplish. I have previously described the task of thinking about the interrelationship between science and religion as a search for resonance.¹ In this paper, I envisioned myself standing in the middle of five sound sources (radios in the pictorial version) broadcasting auditory information needing to be heard and harmonised: science (systematic empirical observations); rationality (theories, mathematics, philosophical arguments, etc.); subjective experience (what we know it to be like to be a human being); tradition (cultural heritage and wisdom, including religious traditions) and revelation (authoritative religious texts like the Bible). Within this metaphor, my task is to find resonance and avoid dissonance when the sounds are heard together. That is, I work to see if the sounds being broadcast from each source can be adjusted (always within a range that remains true to the particular form of information) so as to be resonant and harmonious with the other sources, rather than dissonant and discordant.

Malcolm Jeeves has provided us with a paper that does a very good job of helping us make reasonable adjustments in our scientific (i.e., psychology and neuroscience) and religious (specifically Christian faith) understandings – allowing us to dispense with some of the dissonance and hear more of the resonance. Jeeves stands in the tradition of eminent scientists like Robert Boyle for whom finding resonance between science and faith was considered an important scholarly endeavour.

At the outset of this response, I must confess that I am not an entirely objective respondent to Professor Jeeves' paper. He and I have been co-workers and co-authors both in neuroscience research (we have co-authored several papers on interhemispheric interactions and agenesis of the corpus callosum)² and in explorations regarding the issues surrounding science and faith.³ Indeed, we have just completed a co-authored book that extensively overlaps with the top-

1 Brown, W.S. 'Resonance: a model for relating science, psychology and faith', *Journal of Psychology and Christianity* (2004) 23, 110-120.

2 Brown, W.S & Jeeves, M.A. 'Bilateral field advantage and evoked potential interhemispheric transfer time', *Neuropsychologia* (1993) 31, 1267-1281; Brown, W.S. Larson, E.B. & Jeeves, M.A. 'Directional asymmetries in interhemispheric transfer time: evidence from visual evoked potentials', *Neuropsychologia* (1994) 32, 439-448; Brown, W.S., Jeeves, M.A., Dietrich, R. & Burnison, D.S. 'Bilateral field advantage and evoked potential interhemispheric transmission in commissurotomy and callosal agenesis', *Neuropsychologia* (1999) 37, 1154-1180.

ics discussed in Professor Jeeves' lecture and paper.⁴ Thus, I am understandably very much in agreement with what he has written and the conclusions he has reached. Because of this, my comments are more in the form of elaboration and extension, than critique or disagreement.

There are three issues I wish to cover by way of enhancing the resonance created by Jeeves' paper. First, I will elaborate and comment on the range of terms used to label various emergentist positions on the mind-body or body-soul issue. Rather than argue about positions and labels, I wish to emphasise what each highlights as a contrast to the standard Cartesian view. Secondly, I will point to (but not defend) ideas and resources which give greater substance to the idea of 'emergence'. This concept is critical to finding resonance between an embodied view of humankind, scientific descriptions of the physical and biological world, psychological accounts of human mental life, and religious ideas about human nature. Finally, I will briefly elaborate on the nature of moral agency over against the interpretive structure used in much of current neuroscience research on moral behaviour.

Terminological tangles

Jeeves argues that persons are *embodied*, that is, bodies with capacities for personhood, rather than minds or souls residing within bodies. In order to hold this view of persons, we must reject two alternative positions. First, we must reject the substance dualism of Rene Descartes which holds that human beings are composed of two fundamental substances – bodies and souls. (Jeeves also mentions the substance dualism of Stewart Goetz⁵ which is essentially a recapitulation of this Cartesian view.) Secondly, the concept of the embodiment of *personhood* would also involve rejection of *eliminative materialism* – the view that talk of mind can be eliminated or replaced in favour of a description of the actions and interactions of molecules and atoms. Within eliminative materialism, all of the important aspects of personhood, including the mind, consciousness, and free will, are considered epiphenomenal in that all the real causal work is done at the micro-level of the molecules, atoms and subatomic particles that constitute the body.

Between Cartesian dualism and eliminative materialism there is a range of

3 Brown, W.S. & Jeeves, M.A. 'Portraits of human nature: Reconciling neuroscience and Christian anthropology', *Science and Christian Belief* (1999) 11, 139-150. We have also contributed chapters to each others edited volumes: Brown, W.S., Murphy, N. & Malony, H.N. (eds.) *Whatever Happened of the Soul? Scientific and Theological Portraits of Human Nature*, Minneapolis: Fortress Press (1998); Jeeves, M.A. (ed.) *From Cells to Souls: Changing Portraits of Human Nature*, Grand Rapids: Eerdmans (2004).

4 Jeeves, M.A. & Brown, W.S. *Neuroscience, Psychology and Religion*, Philadelphia & London: Templeton Press, in press.

5 Goetz, S. 'Substance Dualism', chap. in Green, J.B. & Palmer, S.L. *In Search of the Soul, Four Views of the Mind-Body Problem*, Downers Grove, Ill: Intervarsity Press (2005), pp. 33-60.

views, the majority of which posit some form of *emergence*. Emergence denotes the fact that new properties emerge from the organisation and interaction of the elements composing a system. Thus, organisation of molecules into cells, and cells into bodies, allows for the emergence of new properties (from the basic functions of biological life to the dynamics of the mind) that cannot be exhaustively explained by the laws operating at the lower levels of molecules and atoms. These emergent properties are causal in that systems (like single cells and whole bodies) can make things happen in the world that go beyond that which is at all possible within the action repertoire of the individual elements that make up the system. Emergentists thus believe that mind is not epiphenomenal, but is an emergent causal property of the human brain-body that allows persons to be genuine agents in the world.

Nobel laureate Roger Sperry was among the first modern scientist to advocate an emergentist view, particularly with respect to human consciousness. Sperry argues that consciousness is ‘a dynamic emergent of brain activity, neither identical with, nor reducible to, the neural events of which it is mainly composed’.⁶ With respect to the causal role of such emergent properties, he writes, ‘the emergent properties...are not interpreted to be mere passive, parallel correlates, or passive aspects or byproducts of cortical events, but as active causal determinants essential to the normal cerebral control’.⁷

There are many terms that are used by different theorists to denote various versions of the *emergentist* view of embodied human nature. Jeeves mentions some of these emergentist views and points out that ‘all share the view that eliminative materialism is inadequate in that it fails to give adequate weight to the primary data of conscious experience’. However, it is helpful to think not only about what these positions have in common, but what each uniquely emphasises.

Among emergentists, the closest to the Cartesian view is the *emergent dualism* of philosopher William Hasker.⁸ Hasker believes that mind (or soul) emerges from the processes of the physical brain and body. However, Hasker wishes to emphasise that, once mental properties have emerged, ‘the mind’ can rightfully be considered a separate ontological entity. Thus, neurobiological emergence results in two separable entities. Kevin Corcoran argues for a *constitutive view* of persons.⁹ He maintains that ‘we human persons are constituted by our bodies without being identical with the bodies that constitute us’.¹⁰ This view is similar to that of Lynn Rudder Baker.¹¹ Corcoran’s motiva-

6 Sperry, R. ‘Forebrain commissurotomy and conscious awareness’, *The Journal of Medicine and Philosophy* (1977) Vol. 2 (2), 117.

7 Sperry, *ibid*, 119.

8 Hasker, W. ‘On Behalf of Emergent Dualism’, chap. in Green & Palmer *op. cit.*, (5), pp.75-100.

9 Corcoran, K. ‘The Constitution View of Persons’, chap. in Green & Palmer *op. cit.*, (5), pp.153-176.

10 Corcoran, *ibid*, p. 156.

11 Baker, L.R. *Persons and Bodies*, Cambridge: Cambridge University Press (2000).

tion in adopting this view is the religious concern to account for the maintenance of personal identity after death of the body. Thus the property of identity which is constituted (or emerges from) our physical bodies becomes separable from the body that constitutes its identity on earth.

Malcolm Jeeves¹² and Donald Mackay¹³ prefer the designation *dual aspect monism*. The term *monism* here points to a strong view of the embodiment of the mental and soulish aspects of humankind. The modifier *dual-aspect* emphasises the fact that an adequate description of human nature must entail at least two levels (or aspects) – a physical description provided by neurobiology and a mental description as represented in our subjective experiences and as studied by psychology. Thus, the choice of this terminology is motivated by the importance of what MacKay refers to as ‘semantic hygiene’ – that is, not conflating neurobiological language and psychological (or subjective) language as if the terms point to precisely the same thing.¹⁴ Neurobiology is the substratum from which mental properties emerge, but the emergent properties require new descriptive language and new causal laws. Embodiment is revealed by the ‘remarkable *interdependence* between what is occurring at the cognitive level and what is occurring at the physical level’.¹⁵

In various previous books and chapters, philosopher Nancey Murphy and I have preferred to use the term *nonreductive physicalism*.¹⁶ Use of this term is motivated by being philosophically explicit and, to some degree, minimalist (that is, foundational to further arguments). The term *physicalism* explicitly denotes the fact that humans are essentially physical. However, neurobiology is seen as sufficiently complex to support the emergence of mental properties that have a real causal influence on behaviour. These mental properties cannot be reduced to (i.e., exhaustively explained by) the neurobiological substrate and are thus *nonreductive* properties. Thus, dual-aspect monism and nonreductive physicalism represent largely the same view of the nature of humankind, but differ primarily in what they seek to emphasise. Both views are forms of emergent monism, but one emphasises the differences between what emerges and what it emerges from, and the other emphasises that what emerges is a very high-level neurobiological (physical) system property whose causal role in the world cannot be reduced to lower-level processes.

What is meant by ‘emergence’?

Jeeves makes the point that some form of revolution in our scientific world-

12 Jeeves, M.A. *Mind Fields: Reflections on the Science of Mind and Brain*, Grand Rapids, MI: Baker Books (1994), pp. 108-113.

13 Mackay, D. *Behind the Eye*, Oxford: Blackwell (1991), pp. 61-63.

14 Mackay, *ibid*, pp. 8-10.

15 Jeeves article

16 Murphy, N ‘Nonreductive Physicalism’, chap. in Green & Palmer, *op. cit.*, (5). See also Murphy, N. & Brown, W.S. *Did My Neurons Make Me Do It?: Philosophical and Neurobiological Perspectives on Moral Responsibility and Free Will*, Oxford: Oxford University Press (2007), pp. 7-9.

view will be necessary to comprehend how mental properties can emerge from the activity of a neurobiological system. In this light, Jeeves quotes Thomas Nagel as saying, ‘we should expect theoretical progress in this area to require a major conceptual revolution’.¹⁷ Where might we look in the contemporary scientific or philosophical literature to see the makings of such a revolution? What resources are available to help us comprehend the nature of emergence?

In our book *Did My Neurons Make Me Do It?*, Nancey Murphy and I pointed to what we believe to be the form of conceptual revolution that is necessary. The arguments are complex, only a few of which can be summarised here. The first important new insight is to distinguish between aggregates and systems. Aggregates, like water molecules in a glass, are collections of elements that have properties which are reducible in that the properties can be explained by the laws governing the elements (molecules) themselves. Systems, however, come about when the elements (e.g., molecules) become organised in such a way that they systematically constrain one another, creating a dynamic pattern of interactions – such as the molecules that make up a cell or cell membrane. This creates properties of the whole that are not found in the elements. Thus, cells have properties not entirely reducible to the properties of molecules of proteins and enzymes. These properties are emergent in that they come about only when the molecules are organised into a system involving specific patterns of interaction and constraint. Importantly, the system as a whole has causal influence in interacting with its environment above and beyond what can be ascribed to the individual elements themselves.

Another important insight that can contribute to such a conceptual revolution is the potential for emergence in self-modifying feedback systems. This idea is rather natural for biologists but seemingly difficult for some philosophers of mind. The very simple version of such a system is a thermostat. Such a system, though crude and uninteresting for neurobiology, has the emergent (barely emergent) property of regulating room temperature created by the organisation of the elements of the system to make use of feedback to regulate room temperature. Many philosophers get stuck in conceptualising the mind-brain problems in terms of mental states and brain states at time 1 leading to mental and brain states at time 2, leading to states at time 3, and so on.¹⁸ This formulation of the problem of mind fails to recognise the goals built into the organisation of biological systems and the utilisation of environmental feedback with respect to such goals in action-feedback-evaluation-action loops.¹⁹ Emergent properties of systems get particularly sophisticated when you have a nested hierarchy of such self-modifying action-feedback loops.

The role of action loops, and particularly nested hierarchies of such loops, is

17 Nagel, T. ‘Science and the Mind-Body Problem’, chap. in *What is Our Real Knowledge About the Human Being?*, Vatican City: Pontifica Academia Scientiarum (2007), pp.96-100.

18 Jeagowan Kim reference

19 Murphy & Brown, *op. cit.*, (16) pp. 128-131.

elaborated in the work of MacKay,²⁰ Murphy and Brown,²¹ and Jeeves and Brown.²² The power of self-modifying feedback loops in the emergence of mind (particularly a sense of 'self') within neurobiological systems is elaborated by Douglas Hofstadter in *I Am A Strange Loop*.²³ A number of other writers have expressed similar views of the emergence of mind.²⁴ Most helpful is Alicia Juarrero's book *Dynamics of Action*²⁵ where she argues persuasively for understanding the emergence of real causal human agency from the perspectives of a philosophy of action and dynamical systems theory. Thus, in my estimation, the conceptual revolution that Jeeves and Nagel hope for is already under way and important resources are rapidly becoming available to understand how neurobiological systems can have emergent properties that constitute personhood.

Emergent systems and moral agency

Jeeves' paper includes a brief summary (covered in greater detail in our book, *Neuroscience Psychology and Religion*) of current neuroscience research on moral guidance of thought and behaviour. Generally, this research involves observing distributions of brain activity (via fMRI) while individuals are involved in moral decision-making or computer-mediated interpersonal interactions involving moral values such as fairness and trust. Often the conclusion drawn is that, since there is an identifiable brain subsystem involved, the research demonstrates the biological *determination* of moral behaviour and decision making. This interpretation is based largely upon evolutionary utilitarianism (i.e., the *only* reason the brain area is active and the behaviour occurs is that it was determined to be so by evolutionary selection). However, while this conclusion is a priori and, Malcolm Jeeves and I would argue, only part of the explanation of moral behaviour, it is perhaps the only conclusion that can be drawn prior to a conceptual revolution involving a robust emergentist view of human agency. The emergentist view would argue that the fMRI images merely point to the operation of the contributory lower-level systems from which the moral agency of persons emerges. Moral behaviour itself is the product of a real causal agent in the form of a whole, conscious, deliber-

20 MacKay, *op. cit.*, (13) pp. 141-142.

21 Murphy & Brown, *ibid.*

22 Jeeves & Brown, *op. cit.*, (4), chap. 4.

23 Hofstadter, D.R. *I am a Strange Loop*, New York: Basic Books (2007).

24 Other works on the emergence of mind include: Clark, A. *Being There: Putting Brain, Body, and World Together Again*, Cambridge, MA: MIT Press (1997); Donald, M. *A Mind so Rare: The Evolution of Human Consciousness*, New York: Norton and Co. (2001); Fuster, J.M. *Cortex and Mind: Unifying Cognition*, Oxford: Oxford University Press (2003); Gibbs, R.W. *Embodiment and Cognitive Science*, Cambridge: Cambridge University Press (2006); Alwyn, S. *Stairway to the Mind: The Controversial New Science of Consciousness*, New York: Springer Verlag (1995).

25 Juarrero, A. *Dynamics in Action: Intentional Behavior as a Complex System*, Cambridge, MA: Bradford Books (1999).

ative person – to which these brain systems contribute critical capacities, but do not wholly constitute.

One important variable contributing to the emergence of moral agency in human behaviour is language. Language allows persons to represent themselves within many potential future scenarios using a symbolic semantic system that permits sophisticated representation of the moral value of various behaviours and their impact on oneself and other persons. Admittedly, while allowing flexibility in freeing behaviour from lower-level determinisms, semantic systems are shaped by social environment and culture. This is part of the social *embeddedness* referred to by Jeeves. But social influences simply provide grist for the semantic deliberative mill of the processes of conscious (and unconscious) human thought.²⁶

Of course, in pointing out the causal power of the emergent properties of personhood and the top-down influence of whole-persons-embedded-in-culture, we do not ignore the impact of the neurobiological substrate and its bottom-up constraints on behaviour. While we are moral agents, we are agents who are constrained by the limitations of our neurobiology. This is particularly clear in the case of brain damage or disease, or changes in our neurochemistry or distributions of hormones. There is a reciprocal interaction between the top-down influences of the emergent mental activity and behaviour of the whole person, and the bottom-up influences of the substratum of neurobiology.

The openness of the dialogue between psychology, neuroscience and religion

The critical value of Jeeves' paper is its clear message of the openness of the dialogue between psychology, neuroscience and religion. His paper makes it clear that, when looked at closely and with an open mind, there is no inherent, unavoidable discrepancy between an emergentist view of the human person, what is currently known about human beings within psychology and neuroscience, and the view of human nature found within Christian faith. When viewed openly and giving oneself permission to tune the signals coming from each discipline (of course, always within the acceptable interpretive constraints of the discipline), one does not encounter unavoidable dissonance or disharmony. There is lots of room within both a non-reductive neuroscience and psychology, and good biblical exegesis and theological inquiry for finding deep resonances and pleasing harmonies.

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26 For further argument on the role of language, see chap. 4 'How Can Neural Nets Mean?' in Murphy & Brown, *op. cit.*, (16) pp. 146-192.