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Neuroscience and the Soul – A Response to Malcolm Jeeves

Malcolm Jeeves' wide-ranging lecture brings valuable insight to several areas where psychological and neuroscientific data may seem to challenge Christian belief. I would like to focus on just one of these: the question of how thoughts and emotions relate to the physical brain.

He writes:

Clearly there is a remarkable *interdependence* between what is occurring at the cognitive level and what is occurring at the physical level. We could perhaps describe this as a relationship of *intrinsic interdependence*, using *intrinsic* to mean that, as far as we can see, it describes the way the world is in this regard. Could we perhaps go further than this and say that on the basis of our present knowledge it is an *irreducible* intrinsic interdependence, *by this meaning that we cannot reduce the mental to the physical any more than we can reduce the physical to the mental? In this sense there is an important duality to be recognised but it is not a duality that necessarily implies a substance dualism.*¹

I fully agree.

Many philosophies of mind-brain duality but two main headings

Jeeves goes on by drawing attention to the wide divergence of views about how to model this duality, even among committed Christians, and he mentions just a few of these: emergent dualism (William Hasker), non-reductive physicalism (Nancey Murphy), substance dualism (Stewart Goetz), a constitution view of persons (Kevin Corcoran) and dual aspect monism (Malcolm Jeeves, Donald Mackay). This is only a selection of the many labels that are in circulation, but to avoid our getting lost in a forest of labels I would emphasise that they can all be classified as different forms of either substance dualism (e.g. Hasker's emergent dualism is a nontraditional form of substance dualism) or of substance monism. Moreover, Christians holding to substance monism usually hold to some form of property dualism, and this seems to be the case for Nancey Murphy and Kevin Corcoran, making their views close to dual aspect monism. Thus, most Christian views of the mind-brain relationship can be grouped, at

1 *Italics mine*. 'Substance dualism' is the view that there are two fundamentally different types of substance, mental (mind or soul) and physical (brain). Most substance dualists assume that the soul and brain *interact*, and my use of 'substance dualism' below is limited to this sense of the term, also referred to as 'interactive dualism'.

least approximately, under the two main headings of either *substance dualism* or *dual aspect monism* (with its close cousins). However, Philip Clayton² explicitly argues that his ‘emergentist monism’ is *not* dual aspect monism.

Dual aspect monism

Like Jeeves, I favour dual aspect monism. I had the privilege of being a doctoral student of Donald MacKay, and became convinced of its advantages under his influence. I agree with Malcolm Jeeves (and Donald MacKay) that the evidence from neuroscience provides a strong case against substance dualism. Dual aspect monism, also called *dual-aspect theory* or *dual-perspective theory*, is the view that there is only one entity, the human person, which is not composed of two different ‘substances’, body and soul, but can be viewed from two different aspects, the internal subjective one and the external objective one. It has quite a long history. The earliest proponents of this view were continental philosophers, beginning with the Jewish pantheist Baruch Spinoza followed by Arthur Schopenhauer. Soon after the latter came the German experimental psychologist Gustav Fechner. Within the Anglo-Saxon tradition, a dual aspect view was articulated in the nineteenth century by George Henry Lewes and William James, and is still maintained by many modern philosophers including Thomas Nagel and David Chalmers. Among modern Christians, it was propounded by Donald MacKay and is currently favoured by John Polkinghorne as well as, of course, Malcolm Jeeves.

He writes: ‘Today the accumulating evidence from neuropsychology makes it extremely difficult to maintain a view that there are two different substances interacting in the human person. All the emphasis rather is on the unity of the person, two aspects of which must be studied and taken seriously if a full account is to be given of the mystery of the human person.’

My one difference with Malcolm is that I would prefer to say *neuroscience* (all branches of it), rather than just *neuropsychology*, even if he uses this word in the widest sense to include all studies of the relationship between brain function and psychology: psychological effects of brain lesions and brain stimulation, neuroimaging, and electrophysiological recording. I believe that the other branches of neuroscience are also essential to the debate: biophysics, biochemistry and cell biology of neurons, neuroanatomy, electrophysiology of microcircuits, computational neuroscience, and so on. Modern substance dualist philosophers continue to argue that their views are compatible with neuroscience, and I think that part of the reason is that they pay careful attention only to neuropsychology, largely ignoring the strong mechanistic implications

2 Clayton, P. in Russell R.J.(ed.) *Neuroscience and the Person: Scientific Perspectives on Divine Action.*, Berkeley CA: Vatican Observatory Publications and Center for Theology and the Natural Sciences, Berkeley (2002), pp. 181-214, p. 209.

of the other branches of neuroscience. When evidence from the whole breadth of neuroscience is taken together, it constitutes a truly formidable challenge to substance dualism.

The neuroscientific challenge to substance dualism

I do not mean to deny that neuropsychology constitutes an important part of the challenge. Neuroimaging shows that every aspect of our conscious experience is accompanied by a specific pattern of brain activity. For example, ethical decision-making was shown to involve changes in activity mainly in two areas of the cerebral cortex: the posterior superior temporal sulcus (part of the temporal lobe) and the ventromedial prefrontal cortex (part of the frontal lobe).³ In another study, Carmelite nuns underwent brain imaging while undergoing a mystical experience of union with God. This involved the activation of many different brain regions including the lower part of the parietal lobe, the visual cortex, the caudate nucleus and part of the brain stem.⁴ Neuroimaging only shows that brain activity is *correlated* with mental activity, but psychological testing on brain-lesioned patients provides evidence that brain activity *causes* it in some sense. The fact that brain lesions can affect specific aspects of mental function, for example the ability to see movement, or to understand sentences, or to store new memories, or to plan in advance is already a challenge to classical dualism. Further evidence comes from the fact that electrical or magnetic stimulation of particular brain regions can evoke sensations, complex memories, emotions, even the experience of being ‘out of the body’.⁵

But the modern substance dualist can propose an alternative interpretation of the neuropsychological evidence. He can accept the mechanistic interpretation of the brain as a kind of neural computer, but one that communicates bidirectionally with the soul. He would have to assume that the soul communicates differently with different parts of the brain to explain why lesions or stimulation in different parts of the brain affect different aspects of mentality with great specificity. For example the soul would have to help the part of the prefrontal lobe with planning ahead, and part of the temporal lobe with understanding sentences. This would be complicated, but not in my view impossible to argue, and it would be a form of substance dualism, even if nonclassical.

It is here that the other branches of neuroscience are important to the debate, because they set limits on the role of such a soul. For the best studied cognitive processes, the combined efforts of biophysics, microcircuit electro-

3 Heekeren, H.R., Wartenburger, I., Schmidt, H., Schwintowski, H.P. & Villringer, A. ‘An fMRI study of simple ethical decision-making’, *Neuroreport* (2003) 14, 1215-1219.

4 Beauregard, M. & Paquette, V. ‘Neural correlates of a mystical experience in Carmelite nuns’, *Neuroscience Letters* (2006) 405, 186-190.

5 Penfield, W. ‘The twenty-ninth Maudsley lecture: the role of the temporal cortex in certain psychological phenomena’, *Journal of Mental Science* (1955) 101, 451-465.

physiology and computational neuroscience are providing detailed understanding of how the brain's neurons cooperate to perform complex tasks. The results constitute impressive evidence that the brain is not only necessary, but sufficient for these processes. The visual system provides an excellent example of this. We now understand in detail how neuronal assemblies in the visual cortex made use of information coming from the retina and thalamus to analyse contours independently of their position, separate an image from its background, analyse 3-dimensional structure and recognise forms as complicated as faces despite changes in their size and orientation. Moreover, computer vision programmes draw heavily on the data of brain physiology, and work well without the need for a separate soul.

In my opinion the only kind of substance dualism that is still even remotely defensible in the light of modern neuroscience is a limited one, invoking a separate soul acting on the brain only for very particular aspects of our humanity such as free will (e.g. the philosopher Robert Kane).⁶ Even here, substance dualism is on the defensive, because there are increasing efforts to understand the brain processes of decision making. Neurophysiological experiments in monkeys performing sensory discriminations, combined with lesion studies and computational modelling are providing considerable advances in our understanding, opening the way for ever more informative neuroimaging studies on humans.⁷ But our neurobiological understanding of decision-making is still rather vague in comparison with our precise and detailed understanding of vision and other sensory processes, motor control and memory storage. The 'ghost in the machine' is not quite dead, but is getting smaller every day.

Is this a problem for Christians? Malcolm Jeeves argues that it is not, and favours dual aspect monism. But he firmly rejects eliminative materialism. If we reject the soul in the particular sense of substance dualism, we should follow his example in avoiding also the other extreme.

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6 Kane,R. *The Significance of Free Will*, Oxford: Oxford University Press (1996).

7 Heekeren,H.R., Marrett,S. & Ungerleider,L.G. 'The neural systems that mediate human perceptual decision making', *Nat Rev Neurosci*, (2008) 9, 467-479.