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# Mind & Emergence: From Quantum to Consciousness

By Philip Clayton

Oxford/New York: Oxford University Press, 2004; xi +236 pp.; hb.  
£ 37.00; ISBN: 0-19-927252-2.

[1] Philip Clayton (Ingraham Professor at Claremont School of Theology and Professor of Philosophy and Religion at Claremont Graduate University) is a well-known author among scholars active in the field of science and theology. A well-known translator of some of Wolfhart Pannenberg's works into English, his most recent works are *God and Contemporary Science*<sup>1</sup> and *The Problem of God in Modern Thought*.<sup>2</sup> In recent years, Clayton has expressed a growing interest in the concept of emergence, of which *Mind & Emergence* is a result. In this book, Clayton does nothing less than developing a complex and multifaceted argument for a worldview based on 'strong emergence': the view that novel and irreducibly complex systems can come into existence, with their own structures, laws, and causal mechanisms. Clayton considers the consequences of this view not only for the philosophy of science, but also for biology, the neurosciences and, ultimately, theology.

[2] In the first chapter, 'From Reduction to Emergence' Clayton pictures the fall of reductionism in science and the contemporary struggle between 'physicalism' (i.e. the ontological claim that everything that exists is physical in nature, coupled with an explanatory claim that everything should be explained with reference to lower-level physical entities) and 'dualism' (i.e. the claim that at least humans, but possibly also other organisms, consist both of physical components and non-physical or mental components). Emergence, for Clayton, represents a *tertium quid* and is preferable to both physicalism and dualism. Clayton argues that his concept of emergence contains four elements: ontological monism (the claim that reality is ultimately composed of one basic kind of stuff, though the concepts of physics are insufficient to explain the different forms this stuff can take), property emergence (the view that there are genuinely novel properties in nature), the irreducibility of emergence to lower-level phenomena and interactions, and downward causation (i.e. causal influences of the whole on the parts). Clayton admits that the concept of emergence is not entirely new, though in recent years science has been able to come up with many more examples of emergence in nature. Clayton sketches the history of emergence and argues that the major

1. Edinburgh: Edinburgh University Press 1997.
2. Grand Rapids, MI.: Eerdmans 2000.

challenge for his own concept of emergence is posed by ‘weak emergence,’ the view that emergent properties can be reduced to lower-level interactions between entities.

[3] The second chapter, ‘Defining Emergence,’ deals with problems of defining emergence. This is a rather messy chapter, especially since Clayton is unable to come up with a clear-cut definition of the concept of emergence. He writes: ‘If forced to give a one-sentence definition, I would say that emergence is *the theory that cosmic evolution repeatedly includes unpredictable, irreducible, and novel appearances*’ (39; his italics). However, he immediately relativizes his definition by adding: ‘But simple definitions fail to satisfy. . .’ What the chapter ultimately amounts to is a list – this book contains many such lists! – of eight characteristics of emergence: monism, hierarchical complexity, temporal or emergentist monism, no monolithic law of emergence, patterns across levels of emergence, downward causation, emergentist pluralism, and ‘mind’ as emergent. This sounds quite complicated, but boils down to a worldview in which the world is a hierarchy or ladder of complexity, each level emerging from though irreducible to the former. The sciences, trying to describe and explain this complex world, mirror worldly complexity by a hierarchy of sciences.

[4] This idea of an ‘ontological pluralism [that] begets explanatory pluralism’ (148) is further developed in the third chapter, ‘Emergence in the Natural Sciences.’ According to Clayton this chapter is crucial, in that it should establish the conclusion that the results from the natural sciences point more to strong than to weak emergence. Clayton describes how classical physics emerges from the quantum world, how aspects of theoretical models of artificial systems science (such as computer simulations such as Conway’s Game of Life, neural networks, and colony behaviour) are mirrored in actual cases of emergence in biochemistry (autocatalysis, the Belousov-Zhabotinsky reactions, and self-organizing systems such as the slime mold). From biochemistry there is a transition to biology, to the acknowledgement of emergence in evolution towards, what Clayton calls ‘an emergentist philosophy of biology,’ a philosophy on the basis of which he develops the central argument of this book.

[5] The argument for an emergentist worldview continues in chapter 4, where Clayton describes the connection between ‘Emergence and Mind.’ Clayton argues that science will not be able to understand the connection between mind and brain until strong emergence is taken seriously. In that case, the science studying mind should develop its own concepts and instruments appropriate to describe the structures, laws, and causal mechanisms inherent to mind. This is the only way to overcome the ‘hard problem of consciousness,’ i.e. the discrepancy between (third-person) descriptions of experiences and the (first-person) experiences themselves (the so-called ‘qualia problem’ in philosophy of mind). Clayton also discusses the concept of supervenience, a concept from the philosophy of mind, and argues not surprisingly that weak supervenience is more appropriate than strong supervenience (which from Clayton’s perspective would be indistinguishable from physicalism). Interestingly, although Clayton has committed himself to a kind of ‘gradualism’ in which more complex systems emerge

from lower-level systems, he argues that ‘at some point in evolution this particular quantitative increase [in brain size and interconnectivity] gives rise to what appears as a qualitative change’ (121). Thus, human consciousness represents a kind of ‘leap’ in evolution, since the neural complexity from which human consciousness emerges is found nowhere else in nature. Thus, he concludes that ‘the human brain is the most complex interconnected system we are aware of in the universe’ (148), which is, of course, an argument for human uniqueness.

[6] This aspect of human uniqueness returns in the fifth and final chapter, ‘Emergence and Transcendence.’ This is the only chapter which deals with explicitly theological issues, but it fits fluently with the rest of the book. Indeed, this chapter on the ‘function’ of God in an emergentist worldview reminded me of the function of God in Alfred North Whitehead’s metaphysical system, explicated in his *Process and Reality*.<sup>3</sup> Whitehead needed God as the keystone to his metaphysical system, as the ‘chief exemplification’ of the elements of his metaphysical principles.<sup>4</sup> It seems to me as if Clayton makes a similar move. He has argued that the world in a sense is open to higher-level systems and top-down influences. Thus one could argue, similar to Samuel Alexander or more recently Harold Morowitz, that God is an emergent system going beyond human consciousness in complexity.<sup>5</sup> But Clayton rejects such a suggestion of ‘emergentist theism’ because of its consequences of divinizing humanity and finitizing God. So, even though Clayton commits himself to a weak form of naturalism (arguing that naturalism is the best option, yet inadequate for answering all explanatory questions raised by human existence), he argues that his emergentist worldview needs the theological dualism of theism. The reason for postulating God is the rational structure of the universe (i.e. the fact that nature is such that it can be known by the exercise of human reason). As Clayton (following Thomas Nagel) argues, this rational structure is a necessary postulation, ‘since the activity of reasoning cannot be explained without it’ (176). But whereas Nagel remained agnostic about where this rationality of the universe has come from, Clayton decides to exploit ‘the explanatory advantage of theism’ and argues that ‘the rationalism that Nagel has rightly been compelled to accept itself requires an explanation, which only an intentional creation would be able to provide’ (178). So, since he has already argued that naturalism is unable to account for everything, Clayton sees no reason ‘why one should agree to work under the constraints of its [naturalist] ontology, limiting oneself to natural objects. When we raise the broader explanatory questions we are therefore forced to move beyond what empirical emergence can establish one way or the other’ (180). This move consists in the postulation of a transcendent mind, viz. God. However, Clayton feels that he should then also make an argument for divine action. He argues that the appropriate level of complexity at which divine causality is active is

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3. A.N. Whitehead, *Process and Reality*. Corr. ed. by D.R. Griffin & D.W. Sherburne. New York: The Free Press 1978.

4. *Ibid.*, 343.

5. S. Alexander, *Space, Time, and Deity: The Gifford Lectures for 1916-1918*. (2 vol.) London: Macmillan 1920. H. Morowitz, *The Emergence of Everything: How the World became Complex*. New York: Oxford University Press 2002.

at the level of 'the person as such' or 'the person as a whole' (195), which is an emergent quality of the world without being some kind of mental thing. Thus, Clayton concludes, 'the human person, understood as integrated self or psychophysical agent-in-community, offers the appropriate level on which to introduce the possibility of divine agency. Here, and perhaps here alone [!], a divine agency could be operative that could exercise downward causal influence without being reduced to a manipulator of physical particles or psychotropic neurotransmitters' (198).

[7] What should one think of this book as a whole? It is undoubtedly an exciting book that stirs the imagination. In this book, Clayton attempts to build a system à la Whitehead. It was a pleasure to read this book, but it has many shortcomings as well. The first is that the book seems to have been produced in quite a rush. Much of the book consists of scraps taken from other lectures, which makes the book (especially when it comes to the discussions of scientific theories) rather sketchy. Also, the book has a very messy style of referring to literature. Clayton usually uses endnotes, but too often and unsystematically, page numbers pop up between brackets in a sentence or behind a quotation, as if he didn't read the manuscript twice and simply forgot to put those references in the endnotes! Some publications are missing from the bibliography at the end of the book (such as C.L. Morgan's *Emergent Evolution*, which is quoted quite extensively in the book), and names are misspelled such as the physicist's George Cowan (spelled Cowen), Niles Eldredge (spelled Eldridge), and Brian Goodwin (spelled once as *Goodman*).

[8] Another point of criticism is his use of science to back up his claim to strong emergence in chapter 3. Clayton argues that 'the data support the existence of the strong interpretation [of emergence] in at least some cases' (65). However, the descriptions of e.g. the Belousov-Zhabotinsky reactions (74ff) and the self-organizing slime mold did not make clear to me why strong emergence is preferable over the weak form. The scientific examples simply are too sketchy to allow one to make a proper judgment about whether Clayton is right or not. Perhaps this also has to do with the fact that notions such as 'emergence' and 'complexity' nowhere become more than intuitive notions. One may reply that in chapter 2 there is a list of eight characteristics of emergence which in a sense constitutes a definition. However, concepts such as 'monism,' 'complexity,' 'patterns' and '(downward) causation' also are not well enough described to let one get a good grip on the matter. This is not entirely Clayton's fault, since in most books on emergence, definitions of the concept (or rather the lack thereof) are a major issue. Similar criticisms about lack of definitions could be raised in Clayton's dealing with the philosophy of mind, but I will leave it at this.

[9] One other issue remains: How about the theology in this book? In a sense, this is not a book about theology, but an exercise in philosophy of religion or, at most, an exercise in natural theology (concluding from the rationality of the world to the existence of God). In my view, his idea that God could *only* communicate through 'the person as a whole' (whatever that may mean), is ludicrous! How does Clayton know that? Did God perhaps communicate with him? The more I thought about it, the more it dawned on me that Clayton isn't doing theology at

all. Instead, he erects a metaphysical superstructure and, because it is so huge that the top is hidden in the clouds, postulates that God must somehow be at the top, since such a structure *must* have a top. The problem, however, is that the foundation is extremely shaky. Clayton's metaphysics is built entirely upon the ontological facticity and explanatory strength of strong emergence. Strongly emergent systems are 'irreducibly complex' (a concept also used by adherents of Intelligent Design<sup>6</sup>) and at least some scientific data point to the presence of strong emergence. But how do you know that some systems cannot be explained by referring to constituents? Where does one decide to stop investigating? Postulating new laws and other forms of causality is perfectly normal (physicists do similar things when referring to quantum 'particles'), however to claim that those laws and causal links are irreducible is simply claiming too much on the basis of contemporary science – scientists have only begun exploring emergence since the 1990s! Other's, such as the German philosopher Achim Stephan in his brilliant analysis of the concept of emergence and its history,<sup>7</sup> argue that emergence adds basically very little to science – at least not enough to warrant such a metaphysical superstructure as Clayton's.

[10] Perhaps someday someone will dare to climb Clayton's metaphysical superstructure, only to find out that it has no top. Or rather, the top was never built. It turns out that the constructor found it an exciting project for a while and stimulated many people to spend time and effort on it, but eventually he came to the wise conclusion that there is simply no use for such a structure. So he simply abandoned the entire project. Moreover, if the constructor would have decided to put God on top, the top would have become much too heavy for an earthly construction anyway, collapsing the whole structure in the blink of an eye. . .

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6. At times, Clayton seems to steer close to the ID-position, but ultimately he rejects the position of ID, since he finds their 'proofs' that scientific data point to a cosmic designer, not 'compelling' (161).

7. Achim Stephan, *Emergenz: Von der Unvorhersagbarkeit zur Selbstorganisation*. Paderborn: Mentis Verlag 2004.